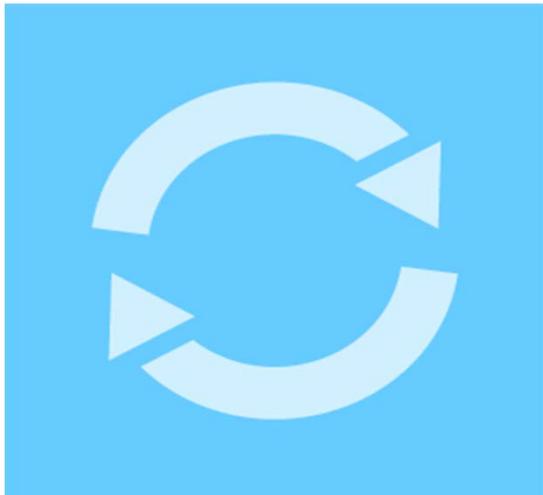


National Accounts

Domestic product and national income
in accordance with ESA 2010
Methods and sources



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List of abbreviations

ABV	Arbeitsgemeinschaft Berufsständischer Versorgungseinrichtungen (Association of Occupational Pension Institutions)
AfA	Absetzungen für Abnutzung (depreciation for wear and tear)
AG	Aktiengesellschaft (limited liability company)
AN	ESA balance sheet items
ARD	Arbeitsgemeinschaft der öffentlich-rechtlichen Rundfunkanstalten der Bundesrepublik Deutschland (Association of Public Broadcasting Corporations of the Federal Republic of Germany)
approx.	approximately
BaFin	Bundesanstalt für Finanzdienstleistungsaufsicht (Federal Financial Supervisory Authority)
BerPensV	Pensionsfondsberichterstattungsverordnung (Pension Fund Reporting Regulation)
BfB	Bundesmonopolverwaltung für Branntwein (Federal Monopoly Administration for Spirits)
BilMoG	Bilanzrechtsmodernisierungsgesetz (Accounting Law Modernisation Act)
BIMA	Bundesanstalt für Immobilienaufgaben (Institute for Federal Real Estate)
BLE	Bundesanstalt für Landwirtschaft und Ernährung (Federal Office for Agriculture and Food)
BMAS	Bundesministerium für Arbeit und Soziales (Federal Ministry of Labour and Social Affairs)
BMEL	Bundesministerium für Ernährung und Landwirtschaft (Federal Ministry of Food and Agriculture)
BMG	Bundesministerium für Gesundheit (Federal Ministry of Health)
bn.	Billions
BPM6	Balance of Payments and International Investment Position Manual, 6th edition
CF	commodity flow account
CFR	Capital formation ratio
cif	cost insurance freight
COFOG	Classification of the Functions of Government
COICOP	Classification of Individual Consumption by Purpose
CPC	Central Product Classification
CPA	Statistical Classification of Products by Activity
DAT	Deutsche Automobil-Treuhand
Data ROSC	Reports on the Observance of Standards and Codes

DIW	Deutsches Institut für Wirtschaftsforschung (German Institute for Economic Research)
DP	Data processing
EAA	Economic accounts for agriculture
ECB	European Central Bank
ECU	European Currency Unit
ED	Electronic data processing
EDP	Excessive Deficit Procedure
EEC	European Economic Community
EC	European Community
ECA	European Court of Auditors
e.g.	for example
ESA	European System of Accounts
ESCB/ESZB	European Statistical System of Central Banks
ESS	European Statistical System
EStG	Einkommensteuergesetz (Income Tax Act)
etc.	et cetera
EU	European Union
EUR	Euro
Eurostat	Statistical Office of the European Union
e.V.	eingetragener Verein (registered association)
EVAS	Einheitliches Verzeichnis aller Statistiken (integrated list of all statistics)
EVS	Einkommens- und Verbrauchsstichprobe (income and consumption sample survey)
KAU	Kind-of-activity unit
kWh	kilowatt hour
FGR	Forstwirtschaftliche Gesamtrechnung (forestry accounts)
Fifo	first in, first out
FISIM	Financial Intermediation Services, Indirectly Measured
fob	free on board
FRIBS	Framework Regulation Integrating Business Statistics
GDP	Gross Domestic Product
GDR	German Democratic Republic
GDV	Gesamtverband der Deutschen Versicherungswirtschaft (German Insurance Association)
GdW	Bundesverband deutscher Wohnungs- und Immobilienunternehmen (Federation of German Housing Enterprises)

GEMA	Gesellschaft für musikalische Aufführungs- und mechanische Vervielfältigungsrechte (Musical Performance and Mechanical Reproduction Rights Society)
GKV	Gesetzliche Krankenversicherung (statutory health insurance)
GmbH & Co KG	Gesellschaft mit beschränkter Haftung & Compagnie Kommanditgesellschaft (limited liability company & Co. limited partnership)
GNI	Gross National Income
GP	Systematisches Güterverzeichnis für Produktionsstatistiken (German Systematic Classification of Commodities for Production Statistics)
GVA	Gross value added
GVL	Gesellschaft zur Verwertung von Leistungsschutzrechten (Society for the Administration of Neighbouring Rights)
GWZ	Gebäude- und Wohnungszählungen (population and housing censuses)
HWWI	Hamburgisches Welt-Wirtschafts-Institut (Hamburg Institute of International Economics)
IE	Investitionserhebung (investment survey)
i.e.	that is to say
Ifo-Institut	Institut für Wirtschaftsforschung, München (Institute for Economic Research, Munich)
ILO	International Labour Organisation
incl.	including
IOR	Input Output Rechnung (input-output compilation)
ISG	Institut für Sozialforschung und Gesellschaftspolitik (Institute for Social Research and Social Policy)
ISIC	International Standard Industrial Classification
IMF	International Monetary Fund
JBU	Jahreserhebung Betriebe (enterprise annual reports)
KBA	Kraftfahrt-Bundesamt (Federal Motor Transport Authority)
KG	Kommanditgesellschaft (limited partnership)
KSE	Kostenstrukturerhebung (cost structure survey)
KStSt	Kostenstrukturstatistik (cost structure statistics)
KZBV	Kassenzahnärztliche Bundesvereinigung (German National Association of Statutory Health Insurance Dentists)
LWR	Laufenden Wirtschaftsrechnungen (continuous household budget surveys)
LPG	Liquefied petroleum gas
MBB	Monatsbericht Betriebe (monthly report for companies)
MIP	Macro-economic Imbalance Procedure

NACE	Statistical classification of economic activities in the European Community
n.e.c.	not elsewhere classified
No	Number
NPISH	No-profit Institutions Serving Households
NUTS	Nomenclature of Territorial Units for Statistics
ÖFEU	Statistik der öffentlichen Fonds, Einrichtungen und Unternehmen (statistics of public funds, institutions and enterprises)
OHG	Offene Handelsgesellschaft (general partnership)
OECD	Organisation for Economic Cooperation and Development
OFD	Oberfinanzdirektion (Regional Finance Office)
p. a.	per annum
para.	Paragraph
PIM	Perpetual Inventory Method
PSVaG	Pensions-Sicherungs-Verein auf Gegenseitigkeit (German Mutual Pension Insurance Association)
R&D	Research and development
Rev.	Revision
SE	Strukturerhebung (structure survey)
SEA	Systematisches Verzeichnis der Einnahmen und Ausgaben der privaten Haushalte (German Classification of Household Income and Expenditure)
seq.	sequential
SGB	Sozialgesetzbuch (Social Code)
SiD	Strukturerhebung im Dienstleistungsbereich (structure survey of the service sector)
SIO	Systematisches Güterverzeichnis in den Input-Output-Rechnungen (German Systematic Product Classification in Input-Output Accounts)
SNA	System of National Accounts
SR	Sonderrechnung (special assessment)
StBA	Statistisches Bundesamt (Federal Statistical Office)
UN	United Nations
URS	Unternehmensregistersystem (business register system)
UStSt	Umsatzsteuerstatistik (VAT statistics)
VBL	Versorgungsanstalt des Bundes und der Länder (pension institution of the Federal State and the Länder)
VAT	Value added tax
VGR	Volkswirtschaftliche Gesamtrechnungen (national accounts)
WiSta	Wirtschaft und Statistik (scientific journal)

WSI	Wirtschafts- und Sozialwissenschaftliches Institut (Institute of Economic and Social Research)
WZ	Klassifikation der Wirtschaftszweige (German classification of economic activities)
ZDF	Zweites Deutsches Fernsehen (public service television channel)

Preliminary remarks

The present document contains the detailed description of the methods and sources used for the compilation of the gross domestic product and the gross national income of the Federal Republic of Germany in compliance with the European System of National Accounts (ESA) 2010. Article 3 of Council Regulation 1287/2003 of 15 July 2003 on the harmonization of gross national income at market prices stipulates that all Member States of the European Union are to prepare and update this description.

The present version incorporates the results of the comprehensive revision of the national accounts which was completed in September 2014. The main purpose of the 2014 revision was to implement the new European System of National and Regional Accounts (ESA 2010), which has replaced the ESA 1995 version as the legally binding basis for the calculations.

The main methodological changes under ESA 2010 concern the following issues:

- Recording of expenditure on research and development as capital formation instead of intermediate consumption;
- Modified delimitation of the so-called small tools, i.e. durable goods of small value such as inexpensive tools and small devices;
- Recording of military weapons systems as capital formation instead of intermediate consumption of general government;
- Changes in the delineation of the government sector.

In addition to that, numerous non-conceptual changes were also incorporated into the German national accounts within the scope of the 2014 major revision. These include, among others, recalculation of dwelling services as a consequence of the 2011 Census and the coverage of certain illegal activities.

The reference year of this inventory is the year 2010, the results for which should be regarded as final. Results of the national accounts are published in the following series of the subject-matter series 18:

- Series 1.1 First annual figures
- Series 1.2 Quarterly results
- Series 1.3 Seasonally adjusted quarterly results according to Census-X-ARIMA and BV4.1
- Series 1.4 Detailed annual results
- Series 1.5 Long-time series since 1970

The present inventory was compiled by staff from the National Accounts Divisions of Department D "National Accounts, Prices" in the Federal Statistical Office of the Federal Republic of Germany.

Wiesbaden, November 2016

Chapter 1 Overview of systems for calculating domestic product

1.1 Introduction

1.01 Production, income, consumption or capital formation are major aspects of economic activity, and are also key factors in national accounts. The purpose of national accounts is to provide the most comprehensive, arranged and well structured quantified picture of a country's entire economy. So that this comprehensibility can be achieved, data have to be condensed. On one hand the numerous economic units are grouped together. On the other hand economic transactions are aggregated and meaningful measurement categories derived. On the international stage, the most commonly used aggregate is gross domestic product (GDP). From a European point of view, importance also attaches to gross national income (GNI), which is the basis for assessing the amount payable by each Member State into the budget of the European Union (EU).

The following document describes the methods and statistical sources used to calculate GDP and GNI at market prices for the Federal Republic of Germany on the basis of the European System of Accounts (ESA) 2010.¹

1.02 The national accounts for the Federal Republic of Germany are compiled by the Federal Statistical Office in department D 'National accounts, prices'. Both departments D1 and D2 are involved in the production of the national accounts results:

Department D1: domestic product, input-output account

Department D2: national income, sector accounts, employment

Around 110 people are employed in total in the two departments.

1.03 In the German system of national accounts, the production and expenditure approaches determine the level of GDP and hence of GNI and the changes over time. This applies not only to the annual and quarterly data at current prices, but also to the corresponding GDP results at prices corrected for inflation.

1.04 The third method is the income approach. At this stage, however, GDP and GNI cannot be calculated on the basis of the income side alone because of the absence of further statistical details, particularly data on the entrepreneurial income. Although an original calculation is possible for domestic compensation of employees, taxes less subsidies on production and consumption of fixed capital, it is not possible for net operating surplus and mixed income.

1.05 Within the system of national accounts, sector accounts provide supplementary information for institutionally orientated users. They also serve as an important instrument ensuring coherence in the system of national accounts. They

¹ See Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013 on the European system of national and regional accounts in the European Union, OJ L 174, 26.6.2013.

simultaneously serve as the basis for a comparison with the financial accounts by sector, which the Deutsche Bundesbank (German Federal Bank) is responsible for compiling.

- 1.06 Detailed information on the supply and use of goods and services forms the basis of the input-output compilation. The final calculation of the annual results involves integrating the GDP accounts with the input-output compilation. A balancing process by type of product based on supply and use tables, provides important indications regarding the consistency of the production and expenditure approaches. Moreover, information by type of product is also extremely important when it comes to adjusting current prices in the calculation of GDP and its aggregates.
- 1.07 At the core of the national wealth accounting by the Federal Statistical Office is a listing of the assets by industries and by asset type (e.g. equipment, buildings). All produced assets used permanently and recurrently in production for longer than one year count as fixed assets. An important indicator in this context is capital stock, which serves as a measure of capital as a production factor. In calculating GDP, wealth accounting provides the consumption of fixed capital, i.e. the consumption of fixed assets as a result of wear and tear and foreseeable obsolescence. Consumption of fixed capital by other non-market producers (government and non-profit institutions serving households) has a direct impact on gross domestic product and gross national income, because their output is the sum total of the production costs (including consumption of fixed capital).
- 1.08 The special focus of the employment account is determining employment by industry, both as the number of persons in employment and the hours worked by them. These data can be used as a measure of labour as a production factor. The data are required to derive significant indicators to be calculated (e.g. productivity of labour, capital intensity, unit labour costs). This information is necessary for calculating GDP because it forms the basis for compiling other figures – e.g. compensation of employees or gross value added of non-profit institutions serving households and in the 'household services' industry; it is also needed to extrapolate short-term GDP estimates and is used for plausibility checks of GDP and GNI.
- 1.09 The **quality of the national accounts calculations** is continuously checked during the calculation process so that possible shortcomings or errors can be detected and eliminated as soon as possible. The main elements of this quality assurance procedure are outlined below, with examples of quality investigations in the various domains.
- Source data, where produced as part of official statistics and used by national accounts, are subjected to quality control in the relevant specialised divisions (baseline statistics). Quality reports are now available for almost all the statistics compiled by the Federal Statistical Office.
 - In national accounts, the source data provided from baseline statistics are checked (again) for exhaustiveness and plausibility. Staff involved in calculating the national accounts are constantly sharing information and experiences with all the major suppliers of data.
 - The 'Coherence' working group, which meets regularly, checks the calculation procedure and the results of the production, expenditure and income approaches and of the input-output compilation for consistency. Any inconsistencies are investigated and rectified, or further analyses are launched.

- A further major quality assurance element is the far-reaching comparison of the source statistics used in national accounts and of the very results of national accounts with complementary data from other sources, carried out in the individual accounting categories. The following are good examples of comparisons of this kind:
 - For many industries the business register supplies the statistical basis for sampling and extrapolation. It is thus an important element of the checks for exhaustiveness. Although the register is not always used directly for the calculations, a comparison with the sources used for the national accounts can yield important, meaningful findings.
 - To support the calculation of the national accounts, regular comparisons with the results of the VAT statistics are carried out in the production approach for almost all industries. It must, however, be borne in mind that this comparison may be biased due to peculiarities of tax law and different economic classifications. Nevertheless, these comparisons have also helped to improve the exhaustiveness of many of the national accounts results in the past.
 - The plausibility of national accounts results for the various industries is checked using indicators such as gross value added per employee and per hour worked, unit labour costs, capital productivity and capital intensity.
 - Gross fixed capital formation in buildings and structures is compared with the equivalent components within the production approach. The calculations for public construction are also compared to the corresponding cash figures from the public finance statistics.
 - As far as possible, the general government final consumption expenditure and its components are reconciled with the income and expenditure of the general government for the purposes of the European Stability and Growth Pact.
 - The rate of change in gross wages and salaries is compared to the rate of change in contributions to the statutory pension insurance made as part of the payroll deductions procedure.
 - The national accounts results are checked against the results of the input-output account. Results from the input-output account for 2011 are currently being used to check the GDP calculations.
 - Setting up sector accounts always involves checking the system coherence. The production, expenditure and income approaches and the financial accounts by sector must be balanced to reflect a closed economic cycle. Any discrepancies, e.g. as the result of different calculation dates or calculation errors, will easily be detected in the balancing items of the sectors and rectified.
- Within the 'National accounts, prices' division responsible for the national accounts, all relevant dates (accounting deadlines, internal delivery dates, balancing deadlines, publication dates and dates for regular meetings) are set each year in December at the latest for the following year. By this means all employees involved with the national accounts will know in advance the date by which they have to complete their calculations for delivery to other specialist units of the department for further attention.

- The German national accounts department maintains an intensive exchange of information and experience with all the major data suppliers and users, the specialist departments, ministries, trade associations, universities and research institutes.
- The Federal Statistical Office has been publishing a quality report on the national accounts for several years. This quality report contains, among other information, annually updated revision measurements (such as the mean revision and the mean absolute revision) for GDP. In the past, the current revisions of the German GDP have always been within a reasonable scope, given their great timeliness.

1.2 Revisions policy and timetable for revising and finalising the estimates; major revisions since the 2005 inventory

1.10 In Germany, the results of the national accounts are regularly subject to revisions, for example by including new data, new statistics, new definitions and/or new methods in the system of national accounts. This involves distinguishing between regular current revisions and comprehensive or major revisions that take place less frequently.

1.11 **Current revisions** refer to corrections for individual quarters and/or years and take place within the normal accounting procedures. Generally this can take place for any publication date. The quarters of the current year are usually checked each quarter, whereas the annual and quarterly data from the last four years are revised once a year (in August).

Current revisions are carried out to integrate into the accounts the current information that deviates significantly from the existing data, thereby giving users the soundest possible basis for their analyses and projections. On the other hand, the process of continuous revision must not lead to irritation or uncertainty among users or even doubts as to the reliability and objectivity of the data. Since various users of the national accounts are increasingly pressing for more up-to-date statistics, it is up to the producers of statistics to make it clear that higher timeliness may also require more frequent and extensive current revisions.

1.12 In contrast to this, **major revisions** of the national accounts are conducted about every five years in Germany. These major revisions entail a fundamental review of the entire system of national accounts and corresponding time series. Above all, major revisions serve to introduce new definitions, concepts and data sources into the national accounts system.

The most recent **major revision of national accounts** was completed in summer 2014. The main reason for this major revision was the implementation of the new ESA 2010 into the national accounts system of the Federal Statistical Office. ESA 2010 has been in use since 1 September 2014 and replaces the previous ESA 1995; its use is legally binding for the Member States of the European Union. The changes implemented in the 2014 revision relate to conceptual modifications, the processing of EU action points and the integration of new data sources.

1.13 The largest conceptual change in quantitative terms in the major 2014 revision is that research and development (R&D) is to be treated as fixed capital formation. Research and development is therefore no longer considered to be a current expense for production during the relevant period, but instead an asset that is to be used over a longer time period for production purposes. The use of R&D expenditure is calculated for the relevant period on the basis of consumption of fixed capital.

Further major conceptual changes relate to the recording of military weapons systems as capital formation, the calculation of the output of insurance companies and a change in the way small tools are treated.

- 1.14 The European Commission defines action points when it believes that ESA rules have not been implemented correctly. The background for the action points is the major significance of gross national income as the basis for assessing Member State contributions to the EU budget (so-called EU own resources), which requires GNI Member State data to be comparable. The major action points included in the 2014 revision were the EU-compliant recording of the car scrap scheme, the recalculations for dwelling services and the inclusion of illegal activities (tobacco smuggling, drug production and trafficking) in gross domestic product.
- 1.15 In addition to conceptual changes, in the course of any major revision new data sources that have not yet been used or been available are integrated into the accounting system, and calculation methods are reviewed and modified if necessary (e.g. estimation models, allowances and deductions). There have been major changes in this context in the balance-of-payment statistics compiled by the Deutsche Bundesbank and the employment statistics compiled by the Federal Employment Agency. The 2011 population and housing census is particularly noteworthy as a new data source.
- 1.16 The 2014 revision resulted in a gross domestic product for 2010 that was 3.3% higher than with the previous methodology. 2.7 percentage points of the increase was attributable to conceptual changes and 0.6 percentage points to non-conceptual changes. The revised recording of research and development was responsible for more than two thirds of the total revision effect in 2010. Gross national income was 3.2% higher in 2010 than before the revision.²
- 1.17 The main purpose of the previous **2011 major revision** was to comply with the new economic activity and product classifications, which affected all economic statistics, not just the national accounts. Furthermore, as usual for major revisions, all previous calculations were reviewed thoroughly and systematically, and new findings were integrated into calculations as far as possible.³

1.3 Outline of the production approach

- 1.18 In the production approach, the economic output of a national economy is described from the producer's perspective. Gross value added is the key factor in the production approach, calculated for each industry and acting as the indicator of the economic performance of each industry. In the case of market producers, i.e. particularly companies, output is determined first, and then gross value added is calculated by deducting intermediate consumption. In the case of non-market producers, i.e. particularly the government and non-profit institutions serving households who deliver their services free of charge or at a price that does not cover costs, gross value added

² Detailed information about the major 2014 national accounts revision can be found in the article by N. R ath and A. Braakmann: 'Generalrevision der Volkswirtschaftlichen Gesamtrechnungen 2014 f ur den Zeitraum 1991 bis 2014' in: *Wirtschaft und Statistik*, 9/2014, pp. 502–543.

³ For more details about the 2011 national accounts revision, see R ath, N./Braakmann, A.: 'Revision der Volkswirtschaftlichen Gesamtrechnungen 2011 f ur den Zeitraum 1991 bis 2010', in: *Wirtschaft und Statistik*, 9/2011, pp. 825–865.

is calculated by totalling the relevant expenditure items; intermediate consumption is then added to this total to determine output.

- 1.19 The sum of the gross value added by all industries is the basis for the calculation of **gross domestic product**, with the balance of taxes less subsidies on products forming the intermediate step in this calculation. According to the concepts of ESA 2010, the gross value added is measured at basic prices. This means that the figures for gross value added by the various industries and for their output exclude taxes on products, but include any production subsidies they receive. Taxes and subsidies on products are those that depend on the volume or value of the goods produced or sold (e.g. VAT, import levies and excise duties). The net taxes on products (i.e. taxes less subsidies on products) have to be added to the gross value added (at basic prices) in order to render the gross domestic product (at market prices) equal on the production and expenditure sides.

Table 1–1: Production approach aggregates

Year 2010 in EUR (billions)

Output	4 776.123
– Intermediate consumption (including FISIM)	2 454.428
= Gross value added	2 321.695
+ Taxes on products.....	266.327
– Subsidies on products.....	7.962
= Gross domestic product (GDP)	2 580.060
+ Balance of primary income from the rest of the world	50.832
= Gross national income (GNI)	2 630.892

- 1.20 Gross national income is calculated by subtracting from the gross domestic product any primary incomes that have flowed out of Germany into the rest of the world and, conversely, by adding the primary incomes that domestic economic units have derived from the rest of the world.
- 1.21 When gross value added is calculated by means of the production approach, the various individual economic units are the conceptual basis of the computation. The results, however, are presented in aggregated form by industry (see Table 1–2). An industry comprises all economic units engaged in the same main activity. The basis for the classification of industries is the 2008 German classification of economic activities (WZ 2008), the first four categories of which are identical with those set out in the European industrial classification NACE Rev. 2. The production approach data are published in a special national accounts breakdown as defined in the ESA Regulation, broken down into 64 industries.

Table 1–2: Production approach by industry

WZ 2008 summary (NACE Rev. 2/WZ 2008)	Output	Inter- mediate con- sumption	Gross value added	
			EUR billion	%
A Agriculture, forestry and fishing	45.619	28.919	16.700	0.7
Producing Industries				
B Mining and quarrying	12.531	7.230	5.301	0.2
C Manufacturing.....	1 566.305	1 051.130	515.175	22.2
D Electricity, gas, steam and air conditioning supply	137.077	81.044	56.033	2.4
E Water supply, sanitation and similar	49.902	25.972	23.930	1.0
F Construction.....	231.376	131.533	99.843	4.3
Services				
G Wholesale and retail trade; maintenance and repair of motor vehicles.....	413.803	184.427	229.376	9.9
H Transportation and storage	266.034	158.184	107.850	4.6
I Hotels and restaurants	71.473	38.202	33.271	1.4
J Information and communication	215.078	111.733	103.345	4.5
K Financial and insurance activities	240.275	133.983	106.292	4.6
L Real estate activities	361.146	93.867	267.279	11.5
M Professional, scientific and technical activities	249.401	109.309	140.092	6.0
N Administrative and support service activities	178.389	72.149	106.240	4.6
O Public administration and defence; compulsory social security.....	220.903	74.185	146.718	6.3
P Education.....	132.623	28.956	103.667	4.5
Q Human health and social work activities	242.973	79.007	163.966	7.1
R Arts, entertainment and recreation.....	49.349	18.797	30.552	1.3
S Other service activities n.e.c.	85.299	25.801	59.498	2.6
T Household services.....	6.567	–	6.567	0.3
All industries.....	4 776.123	2 454.428	2 321.695	100

1.22 The calculation of **output** in most market-orientated industries is based on the annual surveys of enterprises in line with the European Structural Business Statistics Regulation. This applies to the manufacturing industry, transport sectors and business services. Annual details are also available from the balance sheets of deposit-taking corporations and insurance corporations. Calculations for agriculture are based on the

results of the economic accounts for agriculture. Output calculations for the other industries are predominantly based on VAT statistics (advance VAT returns and assessments) and data from the business register. Data recorded during the year (monthly and/or quarterly) are used above all within the scope of quarterly domestic product calculation.

- 1.23 The **intermediate consumption** of market producers in most industries is mainly based on the annual structural business statistics. The annual cost structure surveys in the manufacturing industry are particularly important here. For companies with fewer than 20 employees the data is derived from a special representative annual sample survey. In terms of general government, calculation of intermediate consumption is based on the results of financial statistics, as is the calculation of output. However, there are only four-yearly cost structure surveys in some industries. For the few industries without suitable official cost structure statistics, the annual balance sheets of the individual companies can be used if available or special assessments (including in agriculture and housing services) estimations will be required.
- 1.24 The statistical business register forms the **reference framework** for most surveys. The business register is mainly fed and updated with administrative data from the Federal Employment Agency and the fiscal authorities. It contains auxiliary indicators (names and addresses), sort indicators (economic activity, legal form, etc.) and size details (turnover, number of employees) for all economically active companies in Germany and their establishments. For national accounts, the business register is a central tool for linking statistical data to data from administrative and external sources, and partly even forms the basis for calculations.
- 1.25 The source statistics used in the national accounts are in turn based on the results of business accounting and relevant administrative concepts, and must therefore be reconciled with the international **concepts for national accounts** in a multi-stage procedure.
- 1.26 First, there is an industry-specific comparison of all available sources, taking account of quality criteria such as exhaustiveness, accuracy and time availability. The data sources to be given priority for use are selected for each industry on the basis of this comparison.
- 1.27 As part of comprehensive **data validation**, the source data used are adjusted to take account of incorrect attributions to economic sectors or corrected after discovering that the details provided by respondents are incorrect.
- 1.28 Own-account fixed capital formation is added, as this is part of national accounts output but not part of commercial turnover.
- 1.29 Changes in the inventories of semi-finished and finished products are also added. These are part of the output but not the turnover for the period.
- 1.30 Extensive **adjustments for exhaustiveness** are carried out in another step. The various approaches for reviewing exhaustiveness include reconciliation with the employment method and employment accounts the input-output account, the business register and VAT statistics. Separate exhaustiveness checks are also carried out for many of the national accounts areas (e.g. own-account building work, private tuition or prostitution). Based on these exhaustiveness tests, under-reporting allowances are derived for each domain of the production approach, e.g. for cut-off limits, hidden economy activities, smuggling and drug trafficking, tips and benefits in kind.
- 1.31 Explicit corrections are also required when converting business accounting data into national accounts concepts (so-called **conceptual reclassifications**). The conceptual reclassifications relate mainly to the presentation of output and intermediate consumption not including goods for resale ('net value of goods bought for resale'),

the valuation of output at basic prices and intermediate consumption at purchasers' prices and the recording of research and development. The conceptual reclassifications then indicate the 'national accounts result' in accordance with international defined national accounts concepts.

- 1.32 Once all conceptual changes have been carried out, the results of the production and expenditure approaches are balanced on a macroeconomic scale. In principle, the macroeconomic adjustment is normally distributed in proportion to gross value added as calculated in the national accounts and – if the value of output remains unchanged – is offset by a balancing adjustment to intermediate consumption. This is based on the belief that output is generally covered better in statistical terms than intermediate consumption.
- 1.33 The treatment of banking services plays a special role here. FISIM (financial intermediation services, indirectly measured), as a macroeconomic coherent sub-system, are added to the adjusted results of the production and expenditure approaches (to the output of non-market producers and to the intermediate consumption of market producers and non-market producers).

The published figures are generated at the end of the production calculation process.

1.4 Outline of the income approach

- 1.34 The income approach offers a third method of determining gross domestic product and gross national income in addition to the production approach and expenditure approach. However, it is not possible to use a stand-alone income approach to calculate GDP in Germany, given the lack of baseline information about entrepreneurial income and operating surplus. The level of GDP and its changes over time can therefore only be determined using the production and expenditure approaches, although the income approach can be used for validation purposes.
- 1.35 Other than in the production approach and expenditure approach, the income approach is not based on product transactions, but instead focuses on income transactions. GDP and GNI can be calculated as follows in terms of the income generated within Germany:

Table 1–3: Income approach aggregates

Year 2010 in EUR (billions)

Compensation of employees (domestic)	1 281.963
+ Net operating surplus/mixed income	591.902
= Net domestic product at factor cost	1 873.865
+ Taxes less subsidies on production and imports.....	246.470
= Net domestic product at market prices.....	2 120.335
+ Consumption of fixed capital	459.725
= Gross domestic product	2 580.060
+ Balance of primary income with the rest of the world.....	50.832
= Gross national income	2 630.892

- 1.36 However, an original calculation is only possible for domestic compensation of employees, taxes less subsidies on production, consumption of fixed capital and the balance of primary income with the rest of the world. Net operating surplus and mixed income can only be determined on a residual basis using the production approach. To do this, intermediate consumption, compensation of employees, consumption of fixed capital and other taxes less subsidies on production are subtracted from the output total and other subsidies are added. This balance is then used in the income approach. As there has been an explicit transition from business accounting and administrative concepts to the national accounts concepts in ESA 2010 in the production approach, this is no longer required in the income approach. Operating surplus and mixed income are considered complete per se on the grounds of the residual accounting method.
- 1.37 Compensation of employees comprises gross wages and salaries and social contributions paid by the employer. Gross wages and salaries are calculated by multiplying specific average gross wages and salaries by the number of employees in each case. This is carried out by industry at two-digit heading level (divisions) in accordance with WZ 2008 and by employee group. The average gross wages and salaries are calculated in a two-stage process: The baseline values for average gross wages and salaries are calculated at intervals of several years for the various industries, broken down by different employee groups. In a second stage, these baseline values are extrapolated quarterly, using suitable indicators. This method was chosen, since it is not feasible to calculate the average current earnings directly from primary surveys, because no sufficient data are currently available.
- 1.38 All available statistical salary sources are used to calculate gross wages and salaries per employee in a certain industry and, where necessary, adjusted to fit the national accounts concepts. These include labour cost surveys, quarterly earnings surveys, monthly reports on manufacturing, mining, electricity, gas and water supplies as well as in construction industry and information on collective agreements. Estimates are used for salary components not included in source data. This applies in particular to tips and benefits in kind. Estimates based on special assessments are used for employee groups whose average salaries and wages are not reflected at all or only partially in the available source statistics. The gross wages and salaries for household services are calculated using a model.
- 1.39 The calculation of the social contributions paid by the employer is based primarily on data from social insurance fund and information from occupational pension schemes.
- 1.40 Information on the level of coverage of the calculations thus mainly focuses on the degree to which the employment account is covered. Employee numbers divided by employee group are provided in the employment account that is incorporated into the national accounts. Around 60 different data sources are currently used for the employment account. In particular, these include the employment statistics compiled by the Federal Employment Agency, personnel statistics on public service personnel and the results of the microcensus. Considering all industries together, the level of coverage for the employment account stands at almost 100%, based on extensive baseline statistics. Substantial estimates in the employment account are obtained in particular for the construction and household services industries.
- 1.41 The calculation of other taxes on production – of which real property tax is by far the most significant – is based on income data recorded in public finance statistics. The data sources for subsidies are the central government budget and for Länder and local governments the public finance statistics. No further explicit measures to achieve exhaustiveness are required when calculating other taxes on production and imports and other subsidies.

- 1.42 The consumption of fixed capital is an imputed cost in the national accounts, as in business accounting, and is calculated within the framework of the capital stock estimations in accordance with certain established principles. This applies in particular to underlying service life and replacement costs. Calculations are based on the perpetual inventory method in order to ensure exhaustiveness. The calculation of consumption of fixed capital in Germany follows the recommendations of ESA 2010 in all points.
- 1.43 The calculation of the balance of primary income with the rest of the world is based on the results of the Bbalance ofP ayments statistics.

1.5 Outline of the expenditure approach

- 1.44 The expenditure approach estimates the output of a national economy from the expenditure side. At the core of this approach is the value of the final use of domestic goods and services. Figures for final consumption expenditure, capital formation and the balance of exports and imports (i.e. exports minus imports) have to be determined. These aggregates are sometimes also known as categories of use. The composition of gross domestic product by individual categories of use is shown in table 1–4.
- 1.45 Many statistical sources are used to calculate the various categories of use. Although the emphasis is on official **sources**, non-official sources are also used. Some source statistics come from specific annual surveys, whilst others are based on the aggregated totals of quarterly or monthly figures.
- 1.46 Household final consumption expenditure is basically determined in national accounts using information from suppliers to households. The starting point for calculations in accordance with the supplier method are the turnovers of suppliers to households, i.e. particularly retail trade. Further information is provided by the annual structural surveys for the various industries, VAT statistics and the business register. Information on private consumption ratios, i.e. the proportion of turnover from sales to households, is available from annual surveys for wholesale and retail trade, which is the largest supply category.

Table 1–4: Expenditure approach aggregates

Year 2010 in EUR (billions)

Final consumption expenditure	1 939.610
of private households.....	1 406.989
of non-profit institutions serving households	39.285
of the government	493.336
Gross capital formation	506.347
GFCF in machinery and equipment.....	175.909
GFCF in buildings and structures	237.122
Other capital formation*)	88.418
Changes in inventories and acquisitions less disposals of valuables	4.898
Balalance of exports and imports	134.103
Exports	1 090.085
– Imports	955.982
Gross domestic product	2 580.060
+ Balance of primary income with the rest of the world.....	50.832
Gross national income	2 630.892

*Livestock and crops, intellectual property products

- 1.47 These results are complemented by special product assessments, e.g. for tobacco goods and motor vehicles. These are based on additional data sources, such as tax statistics or information from the Federal Motor Transport Authority. The stratification model results are used to value housing services. The special assessment results are integrated into the supply source.
- 1.48 Statistical sources for government final consumption expenditure include the central government budget and – for Länder and local governments – the results of public finance statistics, broken down in detail according to types of revenue and expenditure; information from social security providers is also incorporated.
- 1.49 Capital formation in machinery and equipment is based on information about goods that are produced, exported and imported, as well as detailed estimates of product-specific fixed capital formation ratios. This (production-side) basis is then transformed into the user-side aggregate value by means of a wide number of supplemental details, e.g. inventory movements, ancillary investment services and trade and transport margins. Quarterly production statistics, monthly foreign trade statistics and VAT statistics are the main sources of data.
- 1.50 The calculation of capital formation in buildings and structures is based mainly on annual surveys of companies with 20 or more employees, annual full surveys in the main construction industry and VAT statistics. Own-account house and building construction is estimated on the basis of a model.
- 1.51 Capital formation in intellectual property products uses, amongst other sources, information from the Stifterverband für die Deutsche Wissenschaft (Donors' Association for the Promotion of Science and Humanities in Germany) and the 'Survey of expenditure, income and personnel of public institutions and institutions receiving

- public funding on science, research and development', university financial statistics and VAT statistics.
- 1.52 The results of foreign trade statistics (for goods imports and exports) and balance-of-payments statistics (for services imports and exports) are used to calculate the balance of exports and imports, supplemented by own calculations.
- 1.53 Various **concept differences** between private/business accounting and administrative concepts and national accounts concepts must be considered when calculating household final consumption expenditure. The main conceptual differences are as follows:
- Imputed rent for owner occupiers' housing costs are included in national accounts.
 - Some expenditure elements for repairs, particularly to dwellings, are not considered final consumption expenditure in the sense of the ESA, but are deemed to be intermediate consumption in relation to housing services; major repairs are also not considered to be final consumption expenditure, but are deemed to be capital formation. .
 - In terms of insurance, national accounts use the service charge, not the complete insurance premium.
- 1.54 Government final consumption expenditure includes imputed social contributions for the insurance scheme for civil servants.
- 1.55 In terms of capital formation, the main differences between the private, tax and commercial law accounting and administrative concepts and the ESA rules are the different definitions and valuation principles. For example, the transition from production to purchasers' price must be made for capital formation for machinery and equipment, including trade and transport margins. In terms of passenger car leasing, vehicles are transferred to the owners, i.e. the lessors, in accordance with ESA rules, as they are allocated to the holder (and not the owner) in the source data from the Federal Motor Transport Authority.
- 1.56 According to ESA 2010, changes in inventories are to be valued at current market prices. In line with the strict lowest value principle, the minimum of the purchase price, replacement costs and a low value including price fluctuations could be used here. As the German national accounts do not currently include any inventories, the conceptual change is limited to value-determining price effects during the reporting period (so-called paper profits).
- 1.57 As in the production and income approaches, the expenditure approach must also include various different additions and/or allowances in order to ensure the exhaustiveness of calculations.
- 1.58 Allowances must be made in household final consumption expenditure for cut-off limits, such as those in VAT statistics, and for small businesses not included in statistics. Allowances are also made for benefits in kind and tips. They are also required for the hidden economy. The main relevant aggregates here are activities without invoices, own-account house construction and unpaid work.
- 1.59 When calculating gross fixed capital formation, allowances are made, amongst others, for own-account fixed capital formation, companies with fewer than 20 employees that are not included in production statistics and trade and transport services.

1.6 GDP balancing within the accounting system and validation methods

- 1.60 GDP is calculated in Germany in two separate ways: the production approach calculates GDP using producers' gross value added and net taxes on products, whilst the expenditure approach calculates GDP as the sum of final consumption expenditure, capital formation and the balance exports and imports. In both approaches, the calculations are performed in a largely autonomous way and are combined in a macroeconomic balancing process. In Germany, it is not feasible to calculate GDP in a third way via the distribution side (income approach) because of the large gaps in information about entrepreneurial income. However, the results from the income approach are used for the creation of macroeconomic indicators for the validation of GDP,.
- 1.61 The methods of calculating GDP can generally be subdivided into three major blocks for the purposes of balancing and validation:
- (1) Macroeconomic balancing
 - (2) Detailed balancing
 - (3) Quality assurance during the process
- 1.62 A **partial reconciliation of components** is required as part of calculations before macroeconomic balancing. Aggregates that are particularly closely related through their statistics are checked for coherence prior to GDP balancing. Particular examples of this are reconciling the calculation of capital expenditure on buildings and structures with construction industry output or reconciling the baseline values for retailing, in order, on the one hand, to calculate household final consumption expenditure and, on the other, to apply the production approach for the retail trade industry.
- 1.63 The following **macroeconomic balancing** procedure serves to verify the results of the largely independently calculated GDP in the production and in the expenditure approaches and to combine them in a macroeconomic system. This procedure is performed separately in each calculation of GDP, starting with the first provisional quarterly GDP calculations (t+45 days after quarter end) and/or the first provisional annual calculation in January of the following year, via the regular more in-depth annual calculations (for the first time after t+18 months) until the major national accounts revisions and back-casting which are carried out at intervals of several years and are mostly used also to ameliorate the calculation methods. During these calculation cycles the statistical data become ever more dense and the quality of the national accounts figures is progressively improved.
- 1.64 **Detailed balancing** (phase 2) is a further approach which involves integration of the GDP and the input-output calculation. Based on supply and use tables, a reconciliation is made on a detailed level of product supplies (domestic production and imports) and of product use (final demand and intermediate consumption). If the detailed balancing reveals that the needed corrections in specific groups of products or industries cannot be done within the sums of data by columns and rows, which are the results of the previous macro-balancing, these results may be changed in another round of the macro-balancing procedure. As a result of a speeded up input-output compilation, which occurred in the last years, it is now possible to partially integrate the input output accounts into the final annual GDP calculations. Nonetheless, there is currently a time lag for this integration of around 3 to 4 years (e.g. the IOA for the reporting year 2011 could be integrated only in Summer 2015). Full integration without a time lag is not possible because of the data situation and the complex calculations involved in the process of input-output compilations.

- 1.65 As well as these two approaches to balancing GDP, there is a whole range of further measures designed to provide **accompanying quality assurance** for the calculations (phase 3). These include, amongst other things, ongoing checks on the national accounts results and cooperation with specialised statistics sources and quality checks on specialised statistics, as well as external checks and consultations.

1.7 Overview of the allowances for exhaustiveness

- 1.66 The exhaustiveness of the results is an important goal of the national accounts, particularly because the European Union has been using gross national income results (previously gross national product) for own resource purposes since 1988. In addition to the country-specific additions and adjustments to ensure exhaustiveness, which have been applied for a long time now in the respective national accounts, a Europe-wide harmonised approach to improve exhaustiveness was agreed in 1994.⁴ This policy mainly provides for a review of existing national estimated allowances, the inclusion of tips and the reconciliation of employment data. Another matter that relates to the concept of exhaustiveness is the examination of the way in which the economic territory⁵ covered by the national accounts is defined.
- 1.67 Paragraph 3.08 of ESA 2010 explicitly states that activities not registered with the authorities are also to be included. In defining economic activities to be recorded in national accounts (within the production boundary), it is irrelevant whether they are practised in accordance with the rules or associated with tax evasion, performed openly or in secret, practised regularly or occasionally, or produced for the market or for own use. Gaps and under-reporting in the source statistics, e.g. as the result of cut-off limits or reporting thresholds, should be remedied in the national accounts either by using estimates and/or on the basis of different official or non-official information.
- 1.68 Given the increasing need for GDP and GNI to be comparable, Member States have been asked to include illegal activities in national accounts calculations as part of the introduction of ESA 2010. The drug trafficking, prostitution and the smuggling of alcohol and tobacco are considered to be the most relevant illegal activities in the EU in terms of GDP and GNI. Prostitution has already been included in previous national accounts calculations in Germany, as it is largely legal in this country. However, as these activities are not recorded exhaustively in source statistics, in order to ensure exhaustiveness, model-based estimates have already been in use for prostitution to a significant extent since the transition to ESA 1995 as part of the comprehensive 1999 national accounts revision.
- 1.69 The exhaustiveness of German national accounts is ensured both by global comparisons and adjustments for exhaustiveness, and also by special allowances for exhaustiveness that relate to one or more industries and/or national accounts domains.

Above all, the exhaustiveness of the national accounts is checked by means of reconciliation with VAT statistics results, the increased use of a business register with

⁴ Commission Decision 94/168/EC, Euratom of 22/02/1994 on measures to be taken to improve exhaustiveness, in OJ L 77, 19.03.1994, pp. 51 et seq.

⁵ Commission Decision 91/450/EEC, Euratom of 26/07/1991 on the definition of economic territory, in OJ L 240, 29.08.1991, pp. 36 et seq. in conjunction with Commission Regulation (EC) No 109/2005 of 24 January 2005 on the definition of the economic territory of Member States for the purposes of Council Regulation (EC, Euratom) No 1287/2003 on the harmonisation of gross national income at market prices, in OJ L 21, 21.01.2005, pp. 3 et seq.

further developed methodology and content and a detailed reconciliation with the input-output account. Certain activities are also recorded implicitly via the calculation method itself. For example, agricultural production is estimated on the basis of cultivated areas and the relevant average yields. Housing rents are calculated on the basis of housing stock broken down by various criteria and the rents per square metre in each case.

- 1.70 The balancing of GDP is a major tool to help ensure exhaustiveness, as mentioned elsewhere. In the balancing of GDP, the results of the production and expenditure approach in particular – which are initially estimated independently of one another – are analysed and assessed in the context of the whole economy. As a rule, this reconciliation has a bias towards the expenditure approach, which leads to an implicit inclusion of sales that are not reported to the fiscal authorities. The greater rise in the figures calculated on the basis of the production approach is due to the fact that, despite numerous allowances in the course of exhaustiveness checks, it is still possible for certain figures to be under-reported in the production approach. This particularly applies in cases where VAT has been charged but has not been transferred to the fiscal authorities. The figures for gross value added and the recorded taxes on products – and therefore also the GDP calculated on the basis of the production approach – could well be too low through these amounts. An upward adjustment is made to compensate for this.
- 1.71 In addition to these global measures for reviewing and ensuring exhaustiveness, the individual domains in the expenditure, income and production approaches are also regularly subjected to exhaustiveness checks; under-reporting is offset with allowances for exhaustiveness.

There are numerous allowances for exhaustiveness in the German national accounts. These include allowances for:

- Units beneath the cut-off limit/reporting threshold for a source statistic
 - Own-account fixed capital formation
 - Tips and benefits in kind
 - Illegal activities (drug trafficking and cigarette smuggling)
 - Work performed by non-entrepreneurs (construction and agriculture)
 - The hidden economy
 - Specific under-reporting in individual industries (e.g. stays in private accommodation in the hotels and restaurants sector, renewable energies in the electricity, gas, steam and air conditioning supply industry)
- 1.72 Under-reporting and resultant allowances are usually determined via reconciliation of various statistics that provide details about the same item from different points of view or via reconciliation of the national accounts calculations with the employment account and, in particular, the input-output account.
- 1.73 The quantitative contribution made to GDP and GNI by economic activities for which there are naturally no explicit sources and therefore no official exhaustive source statistics (hidden economy, illegal activities) is estimated using various different indicators and assumptions on a model basis.
- 1.74 The various adjustments for ensuring exhaustiveness outlined in this section may involve one or more industries or domains for the national accounts. Some allowances for exhaustiveness also relate not just to one, but to two or sometimes even all three calculation methods for GDP and GNI, respectively. This applies, for example, to allowances for tips (output, household final consumption expenditure and

compensation of employees) or allowances for stays in private accommodation (output for the accommodation and food service activities industry and household final consumption expenditure).

1.8 Transition from GDP to GNI

- 1.75 The gross domestic product relates to economic activities in a particular economic territory and measures domestic economic output. Gross national income, on the other hand, is a figure representing the economic activities of residents. In this context, 'residents' are all those individuals living in a particular economic area, irrespective of their nationality and the legal form. The difference between GDP and GNI arises from income transactions with the rest of the world (balance of primary income). For example, outward commuters from Germany contribute to another country's GDP; for the transition to GNI, this amount must be deducted from that country's GDP and added to Germany's GDP (and vice versa for inward commuters to Germany).
- 1.76 Alongside the compensation of employees received from inward and outward commuters, the balance of primary income also includes taxes on production and imports paid to the European Union, the subsidies on products and other subsidies provided by the EU and the cross-border investment income received and paid.

Table 1–5: Transition from GDP to GNI

Year 2010 in EUR (billions)

Gross domestic product	2 580.060	
	From the rest of the world	To the rest of the world
Compensation of employees	9.870	8.028
Taxes on production and imports		4.165
Subsidies	5.648	
Cross-border property income	184.405	136.898
Interest	103.543	93.096
Distributed income of corporations ^{*)}	53.368	34.96
Reinvested earnings on foreign direct investment	19.961	3.572
Investment income attributable to insurance policyholders	1.264	3.662
Income from investment certificates	6.269	1.608
Total primary income	199.923	149.091
Balance of primary income		50.832
Gross national income		2 630.892

^{*)} including rents

- 1.77 In principle, the compensation paid to outward and inward commuters is calculated in the same way as that for domestic employees. Its components, gross wages and salaries and social security contributions paid by employers, are determined separately and then summed up. Gross wages and salaries are calculated by multiplying the average salaries and wages by the number of inward and outward

commuters, respectively. Calculations are primarily based on information from the Deutsche Bundesbank and employment statistics from the Federal Employment Agency. The number of foreign seasonal workers in Germany is estimated using a model.

- 1.78 The taxes on production and import paid to the rest of the world are almost entirely customs duties that flow into European Union own resources. The source used for calculating taxes on production and imports payable to the EU is the result of the balance-of-payments statistics compiled by the Deutsche Bundesbank. Cash receipts in respect of customs duties are time-adjusted by one month.
- 1.79 The subsidies provided by EU institutions, which are mainly other subsidies on production, are taken from the central government budget.
- 1.80 Cross-border property income is derived from a resident's ownership of an external financial asset (credit) and vice versa from income derived from a non-resident's ownership of a domestic financial asset (debit).

Property income can be interest on debt receivables on one hand, or dividends, other earnings from equities, direct investment shares and other participation rights, on the other. It can also include reinvested earnings on direct investments and other property income such as that attributable to insurance policyholders.

The main source for cross-border property income is the balance-of-payment statistics compiled by the Deutsche Bundesbank. Some components, however, and particularly the income side, are estimated, e.g. earnings from foreign securities.

1.9 Overview of classifications used

- 1.81 Classifications are used in order to record and clearly present the vast volume of data collected during the examination of complex material. This binding classification makes it possible to record the observed facts in their entirety and without overlap. Classifications are therefore an important statistical instrument that make it possible to present or analyse the information gained.
- 1.82 The classification of economic activities is vital for the national accounts. Such classification must reflect the reality of economic activity in Germany as closely as possible, whilst also ensuring a high level of cross-border comparability, given the growing international integration of national economies. National interests have also benefited in part from the fact that, for example, extra classification levels have been added in order to generate national versions of internationally agreed classifications.
- 1.83 The following main classifications are used in the German national accounts to break down results in a systematic way:
- Classification of economic activities (WZ; NACE at European level, ISIC at UN level)
 - Classification of product groups (GP; CPA at European level)
 - Classification of individual consumption by purpose (COICOP)
 - Classification of the functions of the government (COFOG)
- 1.84 In a broader sense, the classifications also include the breakdown of national accounts sectors, national accounts transactions, national accounts balances, financial transactions and assets, as well as the Nomenclature of Territorial Units for Statistics (NUTS) for regional data.

- 1.85 Breakdown by industries is particularly important. Industrial classification into 64 industries is harmonised internationally; it corresponds – with some condensation – to the so-called divisions (two-digit headings) for the classification of economic activities and European NACE Rev. 2 and ISIC Rev. 4 at UN level.

1.10 Overview of main data sources

- 1.86 To calculate the national accounts results, all suitable current surveys are used that are available on the particular publishing and/or revision date. For example, this includes:
- Monthly reports for enterprises and businesses involved in manufacturing, mining and quarrying
 - Monthly reports on electricity, gas and water supplies
 - Cost structure survey of manufacturing, mining and quarrying
 - Structure survey for small enterprises in manufacturing, mining and quarrying
 - Annual survey in wholesale and retail trade and in motor vehicle maintenance and repair
 - Investment survey of manufacturing, mining and quarrying
 - Labour cost survey
 - Service statistics
- 1.87 Administrative data is also used, such as:
- Quarterly cash results of general government budgets
 - Quarterly cash results at Federal level
 - Accounting results at Federal level
 - Annual accounts of public funds, institutions and enterprises
 - Tax statistics (including VAT statistics, tobacco duty statistics)
 - Accounting results for social security providers
 - Data from the Federal Employment Agency (including employment statistics)
- 1.88 Household surveys (sample surveys of income and consumption, microcensus, population and housing census), business statistics from major companies (such as Lufthansa, Deutsche Telekom, deposit-taking corporations) and data from associations are also evaluated.

Chapter 2 Revisions policy and timetable for revising and finalising the estimates; major revisions since the 2005 inventory

2.1 Revisions policy and timetable for revising and finalising the estimates

- 2.01 The publication of current data at the earliest possible moment is a typical user request which leads to a trade-off between timeliness and accuracy of official statistics. To publish current economic growth figures as early as possible, results in the national accounts are initially calculated using comparatively incomplete basis data and estimated to some extent. These provisional results are updated continuously for each publication date by means of incorporating new statistical source data, thus establishing a broader data basis.
- 2.02 In Germany the results of the national accounts regularly undergo revisions, for example through including new data, new statistics and/or new methods in the accounting system. This involves distinguishing between current revisions and comprehensive revisions, also known as major revisions.
- 2.03 **Current revisions** relate to minor corrections for individual quarters and/or years, and take place within the normal accounting procedures. They are basically possible for any publication date, but will only be carried out to cover the recent past. In general, the quarters of the current year are checked each quarter. The main annual calculation in August goes back to a maximum of four years (with corresponding quarters).

Current revisions are carried out with a view to ensuring that current information that deviates significantly from the existing data is integrated into the accounts, thereby giving users the soundest possible basis for their analyses and projections. On the other hand, the current revision process must not lead to irritation or uncertainty among users or even doubts as to the reliability and objectivity of the data. Since users of the national accounts are increasingly pressing for more up-to-date statistics, it is up to the producers of statistics to make it clear that higher timeliness may also require more frequent and extensive current revisions.

The following Figure 2–1 shows the timetable for current revisions of GDP and GNI as well as lists the main data sources for the various accounting dates.

Figure 2–1: Timetable and data sources for the annual GDP and GNI results

Accounting and revision dates for year-t figures	Bases for calculation
1. Early January, year t+1 First provisional result	Monthly and quarterly indicators for extrapolating previous year's results. Monthly indicators, some covering a 10-month period, quarterly indicators, mainly covering three quarters
2. Mid-February t+1 First review/revision in connection with the initial publication of the figures for the fourth quarter of year t	Monthly indicators, mostly for a period of 12 months, quarterly indicators, some covering all four quarters, some covering three quarters
3. Mid-May t+1 Second review/revision, if necessary, in connection with the initial publication of the figures for the first quarter of t+1	Monthly and quarterly indicators largely complete
4. Mid-August, year t+1 Third review/revision in connection with the initial publication of the figures for the second quarter of t+1	Full set of monthly and quarterly indicators
5. Mid-August, year t+2 Fourth review/revision in connection with the initial publication of the figures for the second quarter of t+2	availability of annual data for 'initial calculations' for the first time , e.g. <ul style="list-style-type: none"> ▪ annual VAT statistics, annual cost structure survey in areas of the producing industry ▪ annual surveys in wholesale and retail trade and in segments of transport ▪ annual accounts of major companies (including Deutsche Bahn, Deutsche Post, Deutsche Telekom, Lufthansa) ▪ profit and loss accounts of financial and insurance companies ▪ annual financial statistics (not always available in full) ▪ annual survey of the main construction industry
6. Mid-August, year t+3 Fifth review/revision in connection with the initial publication of the figures for the second quarter of t+3	Annual data not yet taken into account or delivered after the publication deadline
7. Mid-August, year t+4 Final result in connection with the initial publication of the figures for the second quarter of t+4	Further annual data not yet taken into account or delivered after the publication deadline

- 2.04 **The first preliminary annual results** for GDP/GNI and their production and expenditure aggregates, as well as the key indicators of the income approach, are published as early as a week and a half after the end of the year to which they relate.
- 2.05 The **first revision (current revision)** of this very early estimate takes place the following February in conjunction with the first publication of the figures for the fourth quarter of the preceding year. Great care is always taken, even at this point, to assess whether the remaining margin for error is sufficiently minimal to allow the retention of the initial annual estimate. However, the very early estimate of the annual results contains numerous statistical gaps, especially for the fourth quarter, and so once fuller information is available for the fourth quarter – or indeed for the first three quarters – there is generally a need to adjust the quarterly results on initial publication of the figures for all four quarters of the last year. Depending on the extent of these adjustments, they may affect the result for the whole year. Another reason for checking and making any initial adjustment necessary to the annual results for the previous reporting year at the end of February in the following year lies in the desire where possible not to change the result of the previous year or individual quarters when publishing the first quarter's figures at the end of May for the current year. The results for the first quarter, which play a vitally important part in analyses and projections of economic trends, require the soundest possible underlying data on each quarter of the previous year.
- 2.06 Despite these efforts, there is a **second check** if necessary and perhaps a change of the previous year's results in May of the following year in conjunction with the first publication of the first quarter, provided the new information renders current revision necessary at this point.
- 2.07 A **third revision**, generally entailing an adjustment of the annual result for the reporting year (t), takes place in August of the following year, since by that time almost all of the regularly updated indicators (monthly and quarterly figures) for the previous year are available. At that point, a revision of earlier years' figures also takes place, mainly on the basis of annual data; this revision can cover a period of up to four reporting years.
- 2.08 With the **fourth** and **fifth revision** of the annual results for the reporting year (t), normally conducted in August of t+2 and t+3, all annual source statistics are integrated.
- 2.09 If necessary, a **sixth revision** for the reporting year (t) is conducted in August t+4 if annual statistics become available late and deviate significantly from previous figures. Particular importance attaches in this context to the annual accounts of the federal states and local authorities which influence not only the level of GDP and GNI but also the net borrowing/lending of general government. After t+4 years, the results – apart from major revisions – are final.
- Since this inventory relates only to annual figures for GDP and GNI, only revisions of annual results are described, even though in Germany the annual and quarterly results are closely linked and are compiled by the same organisational units.
- 2.10 In addition to current revisions, **major revisions** are undertaken, which entail a fundamental review of the entire German national accounts and of any very long time series. Major national accounts revisions are conducted about every five years – most recently in 2014 (implementation of ESA 2010), 2011 (new classifications of economic activities and products) and 2005 (introduction of the use of the previous year's prices and the new rules for recording banking services, FISIM).

- 2.11 Reasons for such comprehensive revisions may include, for example:
- the introduction of new concepts and definitions that can be used to adapt results to new framework conditions in line with international conventions;
 - the introduction of new classifications in the system of national accounts to restructure results;
 - the integration of new, previously unused and/or not yet present statistical data sources into calculations;
 - the use of new calculation methods and accounting models;
 - the modernisation of the presentation and, where necessary, the introduction of new terms and expressions;
 - the improvement of international comparability;
- 2.12 Regular conversion to a new price basis year – which was previously standard practice in major revisions – now no longer applies as a reason for revision. This is because the price-adjusted national accounts results have only been calculated on the basis of the previous year's prices in line with international conventions since the 2005 revision, and a fixed price basis is no longer used.
- 2.13 Out of consideration to the users of national accounts data in particular, such changes should, as a matter of principle, be effected in a single consolidated process announced at an early stage. The existing five-yearly revision cycle has always been accepted by users in Germany. In addition, the consolidation of statistical adjustments into major revisions eases the workload of the production process of the national accounts.
- 2.14 Comprehensive backward projections are usually also carried out as part of comprehensive major revisions, in order to avoid breaks in the time series. It is almost an inherent part of the national accounts to offer data users the longest possible comparable time series. This is why all results since 1991 are usually revised for Germany in major revisions.
- 2.15 The results for the reporting years 1970 to 1991 for the former territory of the Federal Republic of Germany were last revised in the context of the major 2005 national accounts revision and published in September 2006. These results relate to the Federal Republic of Germany including West Berlin according to the frontier status until 3 October 1990, i.e. prior to German reunification. This entailed implementing the concept changes in the major 2005 revision. Changes to data hardly played any role for the period prior to 1991 as there were no significant new data sources. Data for the former territory of the Federal Republic of Germany (i.e. the reporting periods prior to 1991) were not revised in subsequent revisions. This means that long time series, based on comparable methods with annual and quarterly information stretching back to the reporting year 1991, are available to all users, in compliance with the current system of national accounts; by contrast, data for previous years and for the former territory of the Federal Republic of Germany are only comparable to a limited extent, given their conceptual differences.

2.2 Major revisions due to the transition from ESA 1995 to ESA 2010

- 2.16 The 2014 major revision was primarily intended to implement the new European System of Accounts (ESA 2010), which is in turn based on the United Nations System of National Accounts (SNA 2008). However, all previous calculations and results were also revised and new findings and data were integrated into the national accounts

system where possible. This resulted in corrections on various scales in the entire time series from 1991. Generally, the need for revision was greatest for the most recent years as the results of source statistics were in many cases available for the first time.

- 2.17 The recalculation as part of the 2014 national accounts revision has led to an average increase in nominal gross domestic product of roughly 3%. For 2010, GDP amounted to EUR 2 580 billion according to the most recent calculations, which is EUR 85 billion or 3.4% more than determined according to the old methodology.
- 2.18 A major reason for the increase in the level of gross national income is the capitalisation of research and development expenditure. In quantitative terms, this is by far the largest conceptual change caused by ESA 2010, accounting for roughly 70% of the overall effect. For the year 2010, 2.3% of the GNI increase (out of a total of 3.2%) is attributable to the reclassification of research and development. In addition, 0.1% is attributable to the recording of military weapons systems as capital formation and 0.2% to the changes in the way small tools, i.e. durable low-value goods, are defined. There have also been a number of conceptual changes that are only relevant for some aggregates and have no impact on GDP and/or GNI. Overall, the conceptual changes contribute 2.7% to the increase in GNI.
- 2.19 By contrast, non-conceptual changes account for just 0.5% of the overall effect on the GNI. Figure 2–2 provides a summary of the effects of all conceptual changes on GNI. The eleven conceptual changes are discussed in detail below.

Figure 2–2: GNI-related effects when transitioning from ESA 1995 to ESA 2010

For the year 2010

	EUR billion	in % ¹⁾
New result	2 630.892	X
Old result.....	2 549.400	X
Difference	81.492	+ 3.2
of which:		
concept-related	68.226	+ 2.7
(1a) R&D of market producers	47.634	+ 1.9
(1b) R&D of non-market producers.....	12.184	+ 0.5
(2) Valuation of output for own final use for market producers.....	0	0
(3) Insurance – output of non-life insurance and reinsurance	-0.888	- 0.0
(4) Military weapons systems as government fixed assets	2.311	+ 0.1
(5) Decommissioning costs for large capital assets.....	0	0
(6) Government, public and private sector classification.....	0.05	+ 0.0
(7) Small tools.....	5.348	+ 0.2
(8) VAT – based third EU own resource.....	1.587	+ 0.1
(9) Index-linked debt instruments	0	0
(10) Central bank – output allocation	0	0
(11) Land improvements recognised as a separate asset.....	0	0
Not concept-related	13.266	+ 0.5

¹⁾ As % of previous result.

2.2.1 Research and development (R&D) as capital expenditure

2.20 ESA 2010 recognises expenditures for both purchased and own-account R&D as fixed investment and the depreciation of these assets as consumption of fixed capital. This includes government R&D expenditure either protected via patents or made freely available to the public. This is a conceptual change that has a significant influence on major national accounts data. In theory, the value of the output of R&D is equal to the value of discounted future benefits a corporation gets from their R&D investment. These future benefits are difficult to estimate. Furthermore, most R&D is produced on own-account. Therefore the sum of cost approach for valuation of output will usually be applied.

2.21 In ESA 95, there was recognition of some so-called intangible assets, some of them as (produced) fixed (AN.112) and others as non-produced assets (AN.22). The (produced) intangible fixed assets come under the new heading of intellectual property products in ESA 2010. As before, ESA 2010 differentiates between the following assets: mineral exploration, computer software, entertainment, literary and artistic originals, and other intangible fixed assets. ESA 2010 has also expanded property limits by including research and development as another category of intellectual property. In ESA 2010, however, patented although the patent as such (the protection) is not produced but a “construct of society” and “evidenced by legal accounting actions”

Patented entities are part of non-produced intangible assets in ESA 95 (Paragraph 7.19 and Annex 7.1). In ESA 2010, however, patented entries will be recognised as the output of the R&D activity and included under intellectual property products, although the patent as such (the protection) is not produced but a “construct of society” and “evidenced by legal accounting actions”.

2.22 Extending the asset boundary through the recognition of more produced fixed assets will affect important figures throughout the national accounts. Under ESA 95 own-account R&D was usually treated as ancillary activity to the main production of an enterprise. Under ESA 2010 the R&D activity is recognised as output in its own right. This output consists of intellectual property products, which are recognised as assets, which are used up gradually over their economic life. According to ESA 2010, major national accounts indicators such as gross domestic product, gross national income and gross fixed capital formation are higher than in ESA 1995, as the consumption of fixed capital had not been deducted from these gross indicators yet.

2.23 When the R&D is not conducted in-house and used in-house, but produced by a specialist free-standing R&D unit and the intellectual property is sold on to a customer, then the price of this transaction will determine the value of the output of the R&D unit, and the value of the capital asset acquired by the customer. This is no different from the usual treatment of the production and acquisition of produced fixed assets. However, if the R&D output is sold to be used solely in the creation of further products of research and development, then by convention the R&D output will be recorded as intermediate consumption on acquisition by the customer. The assumption is that the bought-in R&D will be embedded in the final R&D product, and so the value is captured there rather than as a separate asset. This avoids double counting of the bought-in R&D, once as an asset in its own right, and then again when it is embedded in the final R&D product.

2.24 In terms of the **effect of R&D capitalisation on national accounts**, ESA 2010 **differentiates** between whether R&D products come from **a) market producers** or **b) non-market producers**, and also whether this is own-account or purchased R&D.

1a) – 1 R&D produced on own account by a market producer In the production approach, the output increases as an output for own final use (P.12) is

identified and value added increases by the amount of R&D costs and mark-up.

In the expenditure approach, gross fixed capital formation increases by the amount of R&D costs and mark-up.

In the income approach, gross operating surplus or mixed income increase by the amount of R&D costs and mark-up.

As a consequence, gross domestic product and gross national income increase.

1a) – 2 A market producer purchases R&D

The purchases are reclassified from intermediate consumption (ESA 95) to gross fixed capital formation (ESA 2010).

As a consequence, gross domestic product and gross national income increase.

1b) – 1 Own-account R&D from non-market producers

In the production approach, the total output as measured by the sum of costs remains the same in the year of the performance of the R&D. R&D expenditure produced on own-account was, under ESA 95, included in the costs and therefore registered as part of non-market output (P.13) and final consumption expenditure (P.3). In ESA 2010, R&D activities are registered as output for own final use (P.12) and the corresponding expenditure as investment (P.51). Therefore, non-market output (P.13) and final consumption expenditure of the non-market producer drop. But total output (P.1) is unchanged, so is value added.

In the succeeding years of economic life of the R&D asset, the costs are increased by the amount of consumption of fixed capital in each year, until the asset value is exhausted. So over time, output and value added are increased by the amount of CFC due to the R&D product.

In the expenditure approach, in the year of creation, final consumption expenditure (P.3) drops by the amount allocated to GFCF representing the creation of the R&D product, and so total expenditure is unaltered in this year. So, R&D expenditure will be reclassified from consumption expenditure to GFCF.

In succeeding years, final consumption expenditure increases by the amount of CFC due to the R&D product. The additional CFC will be recorded in consumption expenditures.

In the income approach, the gross operating surplus or mixed income increases by the amount of consumption of fixed capital for the years in which the R&D product is used.

To summarise, gross domestic product and gross national income rise during the years after the start year in line with the consumption of fixed capital for the R&D product. Net domestic product remains unchanged.

1b) – 2 R&D purchased by a non-market producer

ESA 1995 recorded such purchases as intermediate input (P.2), and consequently as other non-market production (P.13) and final consumption expenditure (P.3). This treatment remains valid for the quantitatively dominant non-market producers in WZ 72 'Research and development', whose R&D purchases flow into their own R&D output. For a non-market producer in any

other economic activity, the purchase is recorded as gross fixed capital formation in accordance with ESA 2010. This reduces both intermediate consumption (P.2) and non-market production (calculated as sum of costs).

Added value (on the production side) remains unchanged.

The rise in gross fixed capital formation (on the expenditure side) corresponds to the reduction in final consumption expenditure.

Where a purchase is only made at the end of the purchase year, this initially has no effect on gross domestic product and gross national income. In subsequent years, additional consumption of fixed capital leads to a rise in non-market production (P.13) and final consumption expenditure; this triggers an increase in gross domestic product and gross national income in total in line with the consumption of fixed capital for capitalised R&D. Net domestic product remains unchanged.

Further methodological guidance on the recording of research and development in ESA2010 is provided in the “Manual on Measuring Research and Development in ESA 2010”⁶.

- 2.25 Consumption of fixed capital is recorded at half the annual rate in Germany in the investment year. Gross domestic product therefore also increases accordingly in the start year, as do all further affected indicators, in line with the consumption of fixed capital for research and development.
- 2.26 The new treatment of research and development as capital formation is the most important quantitative conceptual change in ESA 2010. It has led to a remarkable rise in gross domestic product and gross national income. Around four-fifths of the rise is attributable to market producers' research and development, while around one-fifth is the result of non-market producers' research and development.

2.2.2 Valuation of production for own final use for market producers

- 2.27 The output produced for own final use consists of goods and services that are retained either for own final consumption or for capital formation by the same institutional unit.

The ESA 2010 (3.45) and ESA 95 (3.49) state that output for own final use is to be valued at the basic prices of similar products sold on the market; this generates net operating surplus or mixed income for such output. An example is services of owner-occupied dwellings generating net operating surplus.

But, in cases where basic prices of similar products are not available, the output for own final use should be valued:

- at production costs (ESA 95 3.49)
- at production costs plus a mark-up (except for non-market producers) for net operating surplus or mixed income (ESA 2010 3.45).

- 2.28 ESA 2010 thus makes it clear that a mark-up is required for the output for own final use for market producers.

⁶ Eurostat: „Manual on measuring Research and Development in ESA 2010“, Edition 2014, European Union, 2014.

See also: Adler, W. et al.: „Forschung und Entwicklung in den Volkswirtschaftlichen Gesamtrechnungen“, in *Wirtschaft und Statistik* 12/2014, S. 703 ff, Wiesbaden 2014.

The consequences will be small as, in most cases, the output for own final use is valued by reference to prices of similar products sold in the market.

- 2.29 But, in cases where the output has been valued in ESA 95 as the sum of costs without introducing a mark-up, the output measured in ESA 2010 which includes a mark-up will be higher.

In these cases, the changes in the accounts in ESA 2010, as compared to ESA 95, are the following:

- a) In the production approach, output increases by the value of the (new) mark-up and value added increases by the same amount;
 - b) In the expenditure approach, final consumption expenditure and capital formation increase by the value of the (new) mark-up;
 - c) In the income approach, the gross operating surplus or mixed income increase by the value of the (new) mark-up.
- 2.30 A mark-up for own-account fixed capital formation had already been introduced into national accounts in the 1999 revision, i.e. the transition from ESA 1979 to ESA 1995. The quantitative change effect in Germany with the transition to ESA 2010 is therefore zero.
- 2.31 The mark-up on basic prices is currently approx. 5%. As part of conceptual reclassifications, it is calculated on the basis of a sector-specific profit margin (taken from the annual accounts statistics compiled by the Deutsche Bundesbank) and the proportion of capital formation in buildings and structures and in machinery and equipment in relation to the overall capital formation in fixed assets.
- 2.32 The mark-up, which is now mandatory in accordance with ESA 2010, was thus already taken into consideration in national accounts results before ESA 2010 was introduced. Varying each year, the mark-ups are always based on current year-specific ratios, and therefore do not have to be readjusted as part of the 2014 revision.

2.2.3 Insurance – output of non-life insurance and reinsurance

Part A Adjustment of claims for non-life insurance

- 2.33 Output calculation for insurance undertakings in national accounts depends on the type of insurance, i.e. life insurance or indemnity insurance, referred to as non-life insurance⁷ in ESA 2010. For non-life insurance, output (i.e. the service charge) is calculated in simple terms as follows:

ESA 1995	ESA 2010
Premiums earned	Premiums earned
+ premium supplements, i.e. property income earned on technical reserves	+ premium supplements, i.e. property income earned on technical reserves
– claims	– adjusted claims

⁷ Both terms are used synonymously here.

- 2.34 Adjusted claims are to be added in accordance with ESA 2010, to prevent negative output for non-life insurers, e.g. as the result of claims after extraordinary disasters. These adjusted claims, i.e. normal claims, can be determined using two methods:
- the expectation method uses a model based on claims in the past;
 - the accounting method adds the change in insurance technical reserves to the actual insurance cases that have occurred (on an ex post basis).
- 2.35 Damages beyond the adjusted claims in the case of disasters will be eliminated from output calculation as major damage. The difference between the adjusted and actual claims in such cases is to be recorded as an asset transfer in accordance with ESA 2010.
- 2.36 The change in ESA 2010 prevents output for non-life insurers from becoming overly volatile or even negative. By using 'adjusted claims' as an indicator, ESA 2010 ensures that the service charge remains representative of the activities of non-life insurers for a longer period of time. Adjustment of claims is accompanied in accounting terms with a transfer of assets from the insurance undertaking to the customer.
- 2.37 On the production side, the value added for the insurance increases, at least in the years in which disasters occur. Where insurance services are bought by other producers, their intermediate consumption rises while their value added falls. This means that GDP is only affected by the difference between the changed value added for insurers and that for other producers.

On the expenditure side, GDP rises as the result of the change in consumed and exported insurance services, at least in the years in which disasters occur.

On the income side, GDP is affected by the change in gross operating surplus for the insurer minus the change in gross operating surplus for the policyholder who asserts a claim for insurance services as intermediate consumption.

GNI changes to the same extent as GDP.

- 2.38 Using all available data, German national accounts can determine 'adjusted claims' as an indicator using the accounting method on the basis of data from the insurance sector. This method has already been in use in German national accounts before. Using this calculation method means that there is little difference between the adjusted and actual insurance cases in most years; there is only a major difference if the claims as the result of extraordinary events and/or disasters are so great that they cannot be covered by equalisation reserves. For example, this affects calculations for the year 2001 in relation to the events of 11 September.

This conceptual change has had no effect on GDP and GNI results in Germany since 2010.

Part B Calculation of reinsurance output

- 2.39 The revision of national accounts has led to a changed concept for the treatment of reinsurance transactions. Reinsurance is considered to be the insurance of risks, with a third party, that arise for a primary insurer from insurance business with its direct policyholders. For a reinsurance undertaking, output (i.e. the service charge) is calculated in simple terms as follows:

ESA 1995	ESA 2010
Premiums earned (not including commission)	Premiums earned (not including commission)
- claims	+ premium supplements, i.e. property income earned on technical reserves
	- adjusted claims

2.40 Two changes are introduced in ESA 2010 concerning the reinsurance output:

- The output is increased by the introduction of premium supplements.
- Actual claims are replaced by adjusted claims.

As the second change has already been discussed in Part 1, this part will focus on the first change.

2.41 For domestic business, any change in the charges by reinsurers is reflected in the changes in intermediate consumption of the insurance companies, and so the effect on GDP and GNI is zero.

2.42 In terms of cross-border reinsurance business, the inclusion of premium supplements from invested resources generates new cross-border flows. In the case of a domestic reinsurer who carries out a service for a foreign primary insurer, the value of the exported service is initially increased by the inclusion of premium supplements (see change 1 in Figure 2–3 below). At the same time, imputed (cross-border) investment income to the amount of the premium supplement is recorded for the foreign primary insurer (D.441 investment income attributable to insurance policyholders).

**Figure 2–3: Exported reinsurance services –
Presentation of the effects of changes**

	ESA 1995	ESA 2010
1. Premiums earned	100	100
2. Premium supplements (Change 1)	-	20
3a. Claims	80	-
3b. Adjusted claims (Change 2)*	-	95
4. = GDP (1+2-3).....	20	25
5. Cross-border investment income, receivable.....	-	-
6. Cross-border investment income, payable	-	20
7. = GNI (4+5-6)	20	5

* This includes insurance technical reserves. In the example, these reserves are increased by 15.

2.43 In the production approach, GDP is impacted by the changes of the output of exported reinsurance and of the intermediate consumption of imported reinsurance.

In the expenditure approach, GDP is impacted by the changes in exports and imports.

In the income approach, GDP is impacted by the change in the operating surplus of reinsurers and of insurers consuming reinsurance services.

However, GNI remains unaffected by the recording of premium supplements, as the increased service charge has a corresponding imputed income effect back in the insurer's country. The inclusion of insurance technical reserves when determining the adjusted claims (see change 2) affects both GDP and GNI.

- 2.44 The changes in ESA 2010 regarding reinsurance have the following effects on GDP and GNI:

The difference in balances between the value of exported reinsurance services and the value of imported reinsurance services in accordance with ESA 2010 and ESA 1995 shows the effect of the conceptual changes on GDP. The inclusion of premium supplements and insurance technical reserves (to determine adjusted benefits due) has an impact here.

There is an opposite effect on the balance of primary income in accordance with ESA 2010. As Germany has a remarkable export surplus in reinsurance business, the payable investment income is far greater than the receivable investment income. From a German point of view, this reduced the cross-border balance of primary income in comparison to ESA 1995. GNI is not affected by the inclusion of premium supplements alone. However, it is fundamentally affected by the inclusion of insurance technical reserves (to determine adjusted claims).

2.2.4 Military weapons systems as government fixed assets

- 2.45 According to ESA 1995, only expenditure for military equipment and buildings that can be used for civilian purposes, such as airfields, port facilities, roads and hospitals, are recorded as fixed capital formation (buildings and structures and machinery and equipment). Military weapons and corresponding systems are considered to be intermediate consumption by the government. ESA 2010 treats military equipment differently, with weapons systems that cannot be used for civilian purposes also being considered as fixed assets and their purchase being considered as gross fixed capital formation. This is justified by the fact that military weapons systems (warships, submarines, military aircraft, tanks, missile carriers and launchers) can be used for more than one year continuously as part of the production and provision of security services. They therefore meet the criteria for fixed assets and must be included in capital formation and balance sheets. Weapons systems will be considered to be a separate additional asset type (AN.114), while those systems that can be used for civilian purposes and are already covered will remain part of construction and equipment. Single-use military items such as ammunition, missiles, grenades or bombs are treated as inventories.
- 2.46 ESA 1995 treated the purchase of military weapons systems as current expenditure (intermediate consumption). The expenditure accrued, for example, when purchasing a military aircraft, was recorded completely as intermediate consumption in the purchase year. As the output for the government non-market producer was determined using cost components, this intermediate consumption had an impact on government output, and therefore also government final consumption expenditure. This recording method had no effect on government gross value added.
- 2.47 In ESA 2010, expenditure for military weapons systems is recorded as gross fixed capital formation that is written off over their economic service life. Government gross value added increases in line with this consumption of fixed capital. The change in ESA 2010 has the following effects (in comparison to ESA 1995):
- a) Purchase year

Government intermediate consumption decreases in the production approach, as expenditure for military weapons systems is now considered to be gross fixed capital formation, not intermediate consumption. Government output calculated as the sum of costs therefore decreases accordingly. Government gross value added and GDP remains unchanged.

In the expenditure approach, government final consumption expenditure decreases by the expenditure amount for military weapons systems. As the level of government gross fixed capital formation increases to the same extent, GDP remains unchanged for the time being.

b) Years of economic activity (service life)

In the production approach, government output increases in line with the consumption of fixed capital for military weapons systems. Government gross value added and GDP also increase in line with this consumption of fixed capital.

In the expenditure approach, the new inclusion of consumption of fixed capital for military weapons systems leads to a rise in government final consumption expenditure, with a corresponding rise in GDP.

In the income approach, gross operating surplus and therefore GDP also increase in line with the consumption of fixed capital for military weapons systems.

- 2.48 Data relating to expenditure on military weapons systems can be generated from the relevant budget items in the federal budget (Section 14 Federal Ministry of Defence (BMVg)). This expenditure is now recorded as capital formation, not intermediate consumption. This should be offset by the relevant income from the sale of used weapons systems abroad (Military Equipment Export Report published by the Federal Government). Information about the service life of various military items that is required for calculating the consumption of fixed capital for military weapons systems was derived from national sources, supplemented with international data. Consumption of fixed capital applies as early as the purchase year in German national accounts, as it is assumed that the fixed assets are in stock on average for six months during the purchase year.

2.2.5 Decommissioning costs for large capital assets

- 2.49 Decommissioning costs are the costs that arise at the end of the use of an asset in order to decommission the asset in such a way that there are no longer any undesirable inherited liabilities such as environmental degradation or safety risks. Such termination costs are to be recorded at the end of the service life of a fixed asset as gross fixed capital formation, as part of costs of ownership transfer. In ESA 2010, the original capital formation only consists of the value of the asset and the ownership transfer costs upon purchase (but not the decommissioning costs). Any additional capital formation that reflects the terminal costs is therefore recorded when the asset is decommissioned. This upholds the view that you can only record consumption of fixed capital for fixed assets if they were produced beforehand⁸.
- 2.50 The possibility of very high decommissioning costs for capital assets – such as nuclear power stations – was not considered separately in ESA 1995. This also means that no special requirements were specified above and beyond the general rules for the treatment of ownership transfer costs when selling assets.
- 2.51 The way in which decommissioning costs are distributed over time affects the consumption of fixed capital for a period. Distribution of the consumption of fixed

⁸ From another point of view, the consumption of fixed capital should theoretically cover at least the anticipated terminal costs, i.e. these costs should be included in annual estimates of consumption of fixed capital during the service life of the asset. At the end of the service life, only the unanticipated terminal costs would need to be recorded as consumption of fixed capital at the same time as recording actual terminal costs as capital formation. In practical terms, this would mean recording business reserves as consumption of fixed capital.

capital results in a minor change in the output of non-market producers calculated as sum of costs (production approach), final consumption expenditure (expenditure approach), operating surplus (income approach) and GDP, even though the effect on the overall service life is neutral.

- 2.52 It is unlikely that a good estimate of terminal costs will be possible when commissioning a nuclear power station, bearing in mind that its service life may be 40 years or more. Requirements could also change during service life, meaning that the standard rule in Paragraph 3.139 (last sentence) of ESA 2010 seems realistic, i.e. decommissioning costs are recorded as consumption of fixed capital at the end of the service life if the decommissioning costs are recorded as gross fixed capital formation and have not already been considered in the form of an imputed estimate in the consumption of fixed capital figures for previous years.
- 2.53 As the nuclear power stations in Germany belong to companies that are market producers and the GDP effects arising from the recording of consumption of fixed capital at different times only apply to non-market producers, this new methodological guidance for the consumption of fixed capital in Germany currently has no effect on GDP and/or GNI. The consumption of fixed capital will continue to be recorded on the basis of capital formation carried out as before.

2.2.6 Government, public and private sector classification

- 2.54 The methodological guidance for delineating the general government sector is far more extensive in ESA 2010 in comparison to ESA 1995. This is mainly due to the significant increase in accuracy and reliability requirements for data about the government deficit and government debt for the EU budgetary surveillance, as well as the further development of the measurement process. The changes include more precise regulations about defining the general government sector as distinct from public and private companies.
- 2.55 The starting point for these more precise regulations in ESA 2010 is the rules on sector delineation in ESA 1995, which therefore also act as the basis for deciding whether a unit is primarily active as a market or non-market producer.

In ESA 1995, a unit is assigned to the general government sector if:

- a) It is not a separate institutional unit, that is controlled by government, or
- b) It is a separate institutional unit controlled by government, and it is non-market.

- 2.56 In this context, market production is defined as production intended for the market and sold at economically significant prices (see Paragraphs 3.17 and 3.18 of ESA 1995). ESA 95 paragraph 3.19 states that “output is only sold at economically significant prices when more than 50% of the production costs are covered by sales.”
- 2.57 According to ESA 2010, the delineation between a market and non-market producer will continue to be checked using the standard quantitative criterion (so-called 50% criterion), but with more precise requirements:

Firstly, the 50%-criterion has been tightened up. For the market/non-market test, sales (in accordance with Paragraph 20.30 of ESA 2010) are correlated with production costs (in accordance with Paragraph 20.31 of ESA 2010) for the 50% criterion. A new element in ESA 2010 is that production costs in this test also include costs of capital, which are usually determined approximately via the net interest charge. If the ratio of sales to production costs is over 50%, the unit is a market producer in principle.

On the other hand, ESA 2010 also requires additional testing of the qualitative features of non-market producers. These qualitative criteria are as follows:

- When the unit sells only to government, **and** does not compete with private producers to obtain that this output is sold to government, then the unit is to be classified within general government; **or**
 - When the government has a single supplier in a certain type of goods and services **and** this single supplier sells less than 50% of its output to non-government units **and** it did not compete with private producers to obtain its contract with the government, then the unit is to be classified within the general government; **or**
 - When the producer has no incentive to adjust supply to undertake a viable profit-making activity, to be able to operate in market conditions and to meet its financial obligations, then the unit is to be classified within the general government.
- 2.58 The criteria for the sector classification of non-profit institutions serving households have also been changed. While ESA 1995 states that only those non-profit institutions serving households that are both controlled and mainly financed by the government are to be assigned to the general government sector, ESA 2010 states that only government control is decisive.
- 2.59 The inclusion of the net interest charge in the 50% criterion, i.e. in the denominator of the ratio of sales to production costs, tends to mean that a larger number of units are assigned to the general government sector, resulting in changes in government deficit and debt. Furthermore, this could also lead to changes in gross value added, as the classification of such units in the general government sector changes the determination of output. The same applies both to the inclusion of qualitative criteria and the change in sector classification for non-profit institutions serving households.
- 2.60 Potential units have been re-checked in order to ensure compliance with the tightened 50% criterion. When implementing the qualitative competition criteria, it should be borne in mind that bids to tender usually need to be submitted for government orders. In terms of the turnover criterion, a rule has been in use since the application of ESA 1995 as part of the 2011 revision, that is almost entirely compatible with the ESA 2010 rule. As a result, the tightened criteria on sector classification only have a minor effect on GDP and GNI in Germany.

2.2.7 Small tools

- 2.61 ESA 95 set a lower bound of 500 ECU at 1995 prices for small tools to be recognised as capital expenditure. Purchase of items below this threshold is classified as intermediate consumption.
- 2.62 In ESA 2010, there is no longer a fixed threshold (Paragraphs 3.89 et seq., which differs from ESVG 1995 Ziffer 270 e (1)). The decisive criterion is now whether the product has been used in production for more than one year (Paragraph 3.124). Explicit exceptions include small tools, i.e. inexpensive tools used for common operations such as saws, spades, knives, axes, hammers, screwdrivers, spanners, wrenches and other hand tools, as well as small devices such as pocket calculators, etc., which are recorded as intermediate consumption (Paragraphs 3.130 and 3.89f).
- 2.63 In conceptual terms with this change in definition, the scope of the change to gross value added corresponds to the change in intermediate consumption (production approach), gross fixed capital formation (expenditure approach) and gross operating surplus/mixed income (income approach). No clear orientation of the change can be derived in conceptual terms.
- 2.64 The new ESA 2010 no longer specifies any explicit value limits for fixed assets. In future, the assumption will be that the data from cost structure surveys and other

structure surveys are consistent with the requirements of ESA 2010 in terms of the German legal position.

- 2.65 As the deductions previously made from the balance sheet result must now be stopped according to ESA 2010, GDP and GNI will increase accordingly. This value has initially increased continuously since the beginning of the 1991 time series. The need for corrections in line with ESA 1995 increased significantly in 2008 as the result of changes to the balance sheet value limits. GDP and GNI have therefore increased annually by 0.2–0.3% in the period between 2008 and 2013 as the result of this change.

2.2.8 VAT-based third EU own resource

- 2.66 According to ESA 1995, the VAT contributions collected from the relevant government bodies in the Member States and paid to the institutions of the European Union for the purposes of financing the European Union budget (so-called VAT own resource) were recorded as taxes on production and imports paid directly to the rest of the world.
- 2.67 In ESA 2010, VAT-based third EU own resource is recorded as a current transfer paid by the government of each Member State to the Institutions of the European Union. This contribution to the budget of the Institutions of the European Union is recorded under the heading D76 “VAT and GNI-based EU own resources”.
- 2.68 The new treatment does not impact GDP, but in the passage from GDP to GNI, the amounts of taxes on production and imports (D2) payable to the rest of the world will decrease. Consequently, GNI will increase by the amount of the VAT based third EU own resource.
- 2.69 The amounts previously recorded for VAT own resource as taxes on production payable to the rest of the world are now treated as current transfers to the rest of the world. Based on this change, GNI in Germany will increase after transition to ESA 2010.

2.2.9 Index-linked debt instruments

- 2.70 Under ESA 95, interest on a loan where the principal is index-linked is the difference between the redemption price and the issue price. This method remains the same in ESA 2010 for index-linked securities where the index is a broad-based price measure.
- 2.71 ESA 2010 introduces a different method of estimating interest accrued over the years, when the amount to be paid at maturity is linked to a narrow index that includes a holding gain motive, such as the price of gold. In this case, interest accruals are determined by fixing the rate of accrual at the time of issue. This means that interest accrued is the difference between the issue price and the market expectation of subsequent price movements. Deviation of the underlying index from the expected path leads to holding gains and losses.
- 2.72 In the new ESA 2010, the estimation of interest on narrow-based index-linked loans differs from the previous method, and so interest paid and received on loans across national borders will give rise to new estimates of property income to and from abroad. There is no expectation of bias one way or another in the flows and so GNI will be affected, but in an unknown direction.
- 2.73 Debt instruments based on a narrow index are of no importance at domestic level (in the general government sector), meaning that there is no difference in the accounts compared to the previous calculation. Cross-border income from index-linked debt securities will be determined as part of the balance-of-payment statistics compiled by the Deutsche Bundesbank.

2.2.10 Central bank – output allocation

2.74 In ESA 95, as amended by Council Regulation (EC) N^o 448/98 on calculation and allocation of FISIM, it is stated:

- Paragraph 3.63c “The central bank must not be included in the calculation of FISIM: its output is measured as the sum of costs”
- Paragraph 3.70k “By convention, the Central Bank output should be entirely allocated to the intermediate consumption of other financial intermediaries (subsectors S.122-S.123)”. In ESA 2010, paragraph 3.63c states that:

“The output of the central bank is measured as the sum of its costs”.

Therefore, the output of the central bank remains unchanged in ESA 2010. However, the allocation of output differs in ESA 1995 and ESA 2010.

Paragraph 14.16 of ESA 2010 states:

'Commissions and fees for directly measured services invoiced by the central bank both in respect of resident and non-resident units should be allocated to these units. Only the part of the total central bank output (sum of costs less commissions and fees) which is not sold has to be, by convention, allocated to the intermediate consumption of other FIs – subsectors S.122 (deposit-taking corporations except the central bank) and S.125 (other financial intermediaries, except insurance corporations and pension funds) – in proportion to the respective value added of each of these subsectors. To equilibrate the accounts of subsectors S.122 and S.125, the amount of their respective intermediate consumption of the service provided by the central bank is to be counterbalanced by a current transfer (classified under D.759 "other miscellaneous current transfers") received from the central bank, for the same amount.'

GDP will increase by the amount of the commissions and fees allocated to non-resident units (exports) and resident units for which these commissions and fees correspond to final consumption (General Government – NPISHs – Households). The importing of such central bank services would result in a reduction in GDP. GNI changes to the same extent as GDP.

2.75 Any possible effect from the change would therefore only be triggered by central bank commissions and fees to sectors outside the domestic enterprise sector. Income from the Deutsche Bundesbank commissions and fees in the year 2010 amounted to approx. 5% of the output calculated on the costs side. The type of income (non-cash transactions, cash transactions, securities and deposits, other) gives rise to the assumption that the business partners of the Deutsche Bundesbank are generally all also deposit-taking corporations. There is also no indication that any significant proportion of these deposit-taking corporations are foreign units. There is also no evidence of corresponding imports.

2.2.11 Land improvements recognised as a separate asset

2.76 Land improvements were recorded as capital formation as part of ESA 1995, and were therefore also to be subjected to the consumption of fixed capital in accordance with ESA 1995 Paragraph 6.03. However, land improvements were recorded not as produced assets in the balance sheets, but instead as non-produced assets under the item Land (AN.211). In ESA 2010, the new item AN.1123 Land improvements was introduced as part of Other buildings and structures (AN.112), bringing capital formation for land improvements into line with the changes in corresponding balance

sheets. This also applies to property transfer costs, which are to be included in the item Land improvements.⁹

- 2.77 If the value of the land cannot be separated from that of the land improvement measures situated on it, the combined assets are classified together in the category of the asset that has the greater value.
- 2.78 A comparison of the assets classified under Other buildings and structures (AN.1112) and Land (AN.211) in ESA 1995 is necessary. According to ESA 2010, land improvements are to be recorded under item AN.1123, as far as they can be identified separately. The resultant consequences regarding the balance sheet stock levels are to be incorporated.
- 2.79 These changes can cause an increase in GDP and GNI, where the recognition of the new asset “land improvements” allows the capital formation to be fed into a perpetual inventory model which generates estimates of the changes in the stock of land improvements, and the associated capital consumption of a produced asset will be recorded in the accounts. Where the land improvements occur under the ownership of non-market units, especially government, the capital consumption in years after the capital formation is recognised will result in increased output, expenditure and operating surplus. In practice, it is likely that most of such land improvements will have been recorded under ESA 95 AN.1112 “Other buildings and structures” and in this case the balance sheet stock levels and associated estimates of capital consumption will have been recorded under ESA 95.
- 2.80 If recording has been carried out so far in accordance with the methodology of ESA 1995, there should be no GDP effects as the result of transition to ESA 2010, as both capital formation and the consumption of fixed capital in terms of land improvements should already have been taken into consideration. The expanded framework of ESA 2010 only involves the designation of land improvement as a produced asset. From a purely methodological point of view, the only change expected is in the recording of assets and in the balance sheets, which will have no effect on GDP.
- 2.81 Land improvements have always been considered part of capital formation in buildings and structures in Germany. Both the consumption of fixed capital and the stock of other buildings and structures broken down by industry and sector – including for non-market producers – are determined using the perpetual inventory method on the basis of capital formation in buildings and structures. As a result, there is neither any effect on GDP nor a difference in fixed assets.

2.3 Further major revisions since the 2005 inventory

- 2.82 The 2011 national accounts revision was primarily intended to changeover to the new economic activity and product classifications. In particular, this involved the classification of economic activities, 2008 edition (WZ 2008), corresponding on an international level to NACE Rev. 2, as well as the revised systematic classification of commodities for production statistics (GP 2009), corresponding on an international level to the new CPA. While the new classifications have already been in use in many specialised statistics since 2009, comprehensive reclassified source statistics are required for such a conversion in the national accounts. These are naturally only available at a later date, meaning that the national accounts could only be converted

⁹ See ESA 2010, classification of assets and liabilities in Chapter 23, footnote 1.

to the new classifications as of 2011. The revision was harmonised throughout Europe, resulting in Europe-wide national accounts results revised in 2011 in accordance with the new NACE Rev. 2 and the new CPA.

- 2.83 Alongside the conversion to the new classifications, the reference year for chained price-adjusted indicators was updated; the new reference year was 2005 (previously: 2000). All previous calculations were also checked and revised where necessary, and new findings were integrated into the accounts where possible. This resulted in corrections of different magnitudes in the entire time series from 1991, and a completely new data set was recently created.
- 2.84 The new data sources used include annual surveys, whose results are available for the first time in accordance with the new classification of economic activities (WZ 2008). The national accounts results were also compared to business register results to a greater extent. Another new data source was the 2008 income and consumption sample survey, which only takes place every five years and whose results were therefore available for the first time. There were also new additions to the turnover statistics methodology as of the 2006 reporting year.
- 2.85 Results for Germany starting from 1991 were recalculated as part of the 2011 national accounts revision. The recalculations result in rates of change for the annual original GDP values that differed from the previously published results by up to 0.3%. Generally, the need for revision was especially larger for the last four years (i.e. as of 2007) because, in many cases, the results of source statistics were available for the first time. The extremely volatile economic situation in these years also made estimates more difficult. However, the previous economic picture essentially remained.

2.4 Planned improvements

- 2.86 In terms of planned improvements, there is a differentiation between those that can be integrated into current calculations and those that can only be carried out as part of a major national accounts revision because they involve a longer time series. Discussions at European level are currently still under way regarding the execution of the next 'benchmark revision', although it is likely that such a revision will take place in 2020. By contrast, the next major method revision for national accounts will only take place on the basis of a new SNA 202x and/or the resultant next ESA, whose concrete contents and implementation are not foreseeable at the current time.

From a current perspective, the following improvements are expected:

- removal of national exceptions (derogations) from the ESA 2010 transmission programme in line with legal requirements, particularly the separate presentation of sectors S.14 and S.15 and the annual supply and use tables in the prices of the previous year;
- processing of action points determined as part of GNI checks (i.e. a review of GDP and GNI calculations in accordance with ESA 2010);
- processing of points determined as part of EDP checks on government finance data in accordance with ESA 2010 (excessive deficit procedure, EDP);
- evaluation of findings from checks on MIP indicators (macro-economic imbalance procedure, MIP);
- implementation of more efficient data validation (particularly using the 'data validation' programme at EU level);

- speeding up the compilation of supply and use tables even further, in order to be able to incorporate feedback into current calculations more quickly;
- review of changes needed as the result of specialist statistics amendments (particularly the FRIBS programme and, where necessary, any changes in business statistics as the result of the introduction of the EU definition of an undertaking, as well as amendments in EU intra-trade statistics);
- review of calculations for household final consumption expenditure via a comparative calculation with the results of the 2013 income and consumption sample survey.

Chapter 3 Production approach

3.0 Calculating GDP on the basis of output and value added

- 3.01 In the production approach, the economic output of a national economy is described from the producers' perspective (the so-called production approach). Own-account research and development is shown as part of output separately for 2010. Gross value added is calculated by deducting the value of intermediate consumption from the total output of the country's economic units. As the indicator of the economic performance of all industries, gross value added is the key factor in the production approach. Financial intermediation services indirectly measured (FISIM) are part of the intermediate consumption of each industry, shown as explicit items.
- 3.02 The sum of the gross value added by all industries is the basis for the calculation of **gross domestic product**, with the balance of taxes less subsidies on products forming the intermediate step in this calculation. According to the concepts of ESA 2010, the gross value added is measured at basic prices. This means that the figures for gross value added by the various industries and for their output exclude taxes on products but include any production subsidies they receive. Taxes and subsidies on products are those that depend on the volume or value of the goods produced or sold (e.g. VAT, import levies and excise duties). The net taxes on products (i.e. taxes less subsidies on products) have to be added to the gross value added (at basic prices) in order to render the gross domestic product (at market prices) equal on the production and expenditure sides.

Table 3–1: Production approach aggregates

Year 2010 in EUR (billions)

Output.....	4 776.123
Intermediate consumption (including FISIM).....	2 454.428
= Gross value added	2 321.695
+ Taxes on products.....	266.327
– Subsidies on products	7.962
= Gross domestic product (GDP)	2 580.060
+ Balance of primary income from the rest of the world	50.832
= Gross national income (GNI)	2 630.892

- 3.03 Gross national income is calculated by subtracting from the gross domestic product any primary incomes that have flowed out of Germany into the rest of the world and, conversely, by adding the primary incomes that domestic economic units have derived from the rest of the world (see Table 3–1).
- 3.04 When gross value added is calculated by means of the production approach, the various individual economic units are the conceptual basis of the computation. The findings, however, are presented in aggregated form by industry (see Table 3–2). An industry comprises all economic units engaged in the same main activity. The basis for

the classification of industries is the 2008 German classification of economic activities (WZ 2008), the first four categories of which are identical to those contained in the European industrial classification NACE Rev. 2. WZ 2008 is the result of a revision of the classification of economic activities, 2003 edition (WZ 2003), whose structure was updated extensively and therefore changed. Modifications of the breakdown were required, particularly where there had been major economic and technical changes since the introduction of WZ 2003; this was particularly the case in the service sectors. The production approach data are published in a special national accounts breakdown, divided into 64 industries.

Table 3–2: Production approach by industry

Year 2010

WZ 2008 summary (NACE Rev. 2/WZ 2008)	Output	Intermediate consumption	Gross value added	
	EUR billion			%
A Agriculture, forestry and fishing	45.619	28.919	16.700	0.7
Producing industries				
B Mining and quarrying	12.531	7.230	5.301	0.2
C Manufacturing.....	1 566.305	1 051.130	515.175	22.2
D Electricity, gas, steam and air conditioning supply	137.077	81.044	56.033	2.4
E Water supply, sanitation and similar	49.902	25.972	23.930	1.0
F Construction	231.376	131.533	99.843	4.3
Services				
G Wholesale and retail trade; maintenance and repair of motor vehicles	413.803	184.427	229.376	9.9
H Transportation and storage	266.034	158.184	107.850	4.6
I Hotels and restaurants	71.473	38.202	33.271	1.4
J Information and communication	215.078	111.733	103.345	4.5
K Financial and insurance activities	240.275	133.983	106.292	4.6
L Real estate activities	361.146	93.867	267.279	11.5
M Professional, scientific and technical activities	249.401	109.309	140.092	6.0
N Administrative and support service activities	178.389	72.149	106.240	4.6
O Public administration and defence; compulsory social security	220.903	74.185	146.718	6.3
P Education	132.623	28.956	103.667	4.5
Q Human health and social work activities....	242.973	79.007	163.966	7.1
R Arts, entertainment and recreation	49.349	18.797	30.552	1.3
S Other service activities n.e.c.	85.299	25.801	59.498	2.6
T Household services	6.567	–	6.567	0.3
All industries	4 776.123	2 454.428	2 321.695	100

3.1 Statistical framework

3.1.1 Conceptual framework

3.05 One of the key issues concerning the production approach is the precise definition of statistical **recording units**. ESA 2010 uses three different types of statistical unit as its building blocks:

- institutional units;
- local kind-of-activity units;
- units of homogeneous production.

3.06 The individual industries' output, intermediate consumption and gross value added can vary depending on the type of unit that is chosen. The choice may even alter the output and intermediate consumption figures for the entire economy, but not its gross value added.

3.07 According to ESA 2010, an **institutional unit** is a unit characterised by decision-making autonomy in the exercise of its principal function. It must therefore be entitled to own goods and assets in its own right and to be able to exchange the ownership of goods and assets in transactions with other units, take economic decisions and engage in economic activities, incur liabilities on its own behalf and enter into contracts, as well as being able to draw up a complete set of accounts (transactions, assets and liabilities) (see Paragraph 2.12 of ESA 2010). The institutional units are the building blocks of the various sectors of the economy, and their main purpose is the presentation of the transactions that take place in the domains of income, capital formation and finance.

3.08 An institutional unit may be shown to possess two or more **local kind-of-activity units** described as follows: *'In order to analyse flows occurring in the process of production and in the use of goods and services, it is necessary to choose units which emphasise relationships of a technico-economic kind. This requirement means that institutional units must be partitioned into smaller and more homogeneous units with regard to the kind of production. Local kind-of-activity units are intended to meet this requirement as an operational approach.'* (Paragraph 2.147 of ESA 2010; see also Regulation EEC No 696/93 on statistical units). The full value of the output and intermediate consumption of a local kind-of-activity unit includes supplies of products between such units, i.e. internal supply within an enterprise, but not output destined for processing by the producer unit (work in progress). In principle, there must be as many local kind-of-activity units registered as there are secondary activities in an institutional unit. However, if the accounting documents that would be necessary to describe such activities are not available, a local kind-of-activity unit may include one or several secondary activities (see Paragraph 2.149 of ESA 2010). Local kind-of-activity units are used as a means of recording production processes, and their data are consolidated into industries for accounting purposes.

3.09 **Units of homogeneous production** (Paragraph 2.154 of ESA 2010) serve specific analytical purposes, particularly the presentation of connections between production processes in the framework of the input-output account. Their distinguishing feature is a unique activity that is identified by its inputs, process of production and its outputs in line with CPA. The products each unit produces must fall within a single classification category. Such units are not normally subject to direct observation; on the contrary, the data from statistical surveys have to be restructured in such a way that figures are produced for these notional units.

- 3.10 The **application** of this conceptual framework in Germany showed that it was impossible to achieve an ideal result on the basis of the range of statistical instruments that had been developed over several decades in the field of national accounts.
- Since in most cases in Germany the requisite comprehensive data from business accounting are only available for entire **enterprises**, the enterprise, as the smallest legally independent (institutional) unit, is the 'natural' starting point for calculations. Only very few sets of statistical data contain combined information for each plant as well as for the whole enterprise, and there are no statistical records of intra-enterprise supply operations in Germany in particular. Since it was impossible to convert the whole system to a local kind-of-activity unit basis, the concept of the enterprise has essentially been preserved for those areas of the economy in which enterprises operate (S.11, S.12, S.14), not least for reasons of clarity and interpretation. This means that enterprises are classified into industries on the basis of their primary economic activity, which is identified by measuring the contribution of each activity to the gross value added generated by the enterprise.
 - In the **general government sector**, on the other hand, institutional units (national, regional or local authorities or bodies administering social insurance schemes) can sometimes be classified by industry at the level of the kind-of-activity unit, where the necessary data can be obtained in that degree of detail. Financial statistics can be specially processed so that the data can be broken down into budget chapters (and numbered areas of activity), even though a breakdown relating to individual cases is not possible. If the 50% cost recovery criterion is applied, it is also possible to ascertain whether these newly formed units are market or non-market producers.
 - Within **non-profit institutions serving households** as well, it should be possible in principle to distinguish between any local kind-of-activity units that are market producers and any that are non-market producers; however, this approach can only be taken in respect of housing rented out by these organisations (market production), which is calculated using a model. Other largely cost-covering operations, such as (presumably) emergency services provided by relief and aid organisations, are regarded, in the absence of appropriate statistics, as secondary activities of institutional units rather than kind-of-activity units, unless they have been established as enterprises in their own right.
 - **Housing services** must be regarded as a special case, since in German national accounts practice a body from which housing is rented is always regarded as a kind-of-activity unit, irrespective of whether housing services constitute the primary or secondary activity of the economic unit to which the body belongs. This corresponds to the conventional 'functional' definition of housing services, although they are no longer classed as a separate industry within a comprehensive enterprise sector but now fall under 'real estate activities' (NACE L), covering almost all sectors. For analytical reasons, it is expedient to show the economic activity of housing service provision as a separate entity in this method description. This applies especially to the sub-sector of insurance undertakings, in which actual insurance business and housing services provided to policyholders as part of a profitable investment, have to be recorded separately. The methodology used for national agriculture and forestry accounts also involves a division between local kind-of-activity units in the realm of agriculture and forestry on the one hand, and housing services and owner-occupied dwelling services on the other. The stratification

model used in German national accounts – whereby the output of housing services is measured on the basis of floor area and is broken down in great detail into various dwelling types with their respective levels of rent per square metre – furnishes the necessary differentiated information for this accounting approach.

- In cases where **households** (as institutional units) are run by self-employed persons or business owners, these households are classified by industry on the basis of the primary economic activity of the householder's 'business'. The other production activities in which households engage – particularly if they undertake building work themselves, rent out or occupy their property, employ domestic staff, grow agricultural produce in domestic gardens and even engage, in addition to their primary employment, in independent activities such as academic, artistic or educational work or other primarily occupational activities – appear in the figures for the relevant industry. For analytical and statistical reasons, the aforementioned activities are not consolidated into a separate category. If this were the case, it would be necessary to identify the main activity of each household, which would not be a very meaningful piece of information. Services rendered at home by members of the household (housework) lie beyond the bounds of production as defined in the German national accounts. The production of goods by household members is by convention not included in the ESA, because the total volume of such goods is minimal, although international SNA regulations require such inclusion.

To summarise the above, Figure 3–1 shows the relationship between institutional units and the statistical units, classified by industry. The whole productive structure is now divided into areas of economic activity (as defined in WZ 2008). This is why 'education', for example, now covers not only state schools, but also private and church schools as well as free schools run by charitable organisations.

Figure 3–1: Industries and economic sectors¹⁰

Industry WZ 2008 classification		S.11 Non-financial corporations	S.12 Financial corporations	S.13 General government	S.14 Households	S.15 Non-profit institutions serving households
A	Agriculture, forestry and fishing					
B to F	Producing Industries					
G to I	Wholesale, retail, transport and hotels and restaurants					
J	Information and communication					
K	Financial and insurance activities					
L	Real estate activities					
M to N	Administrative and support service activities					

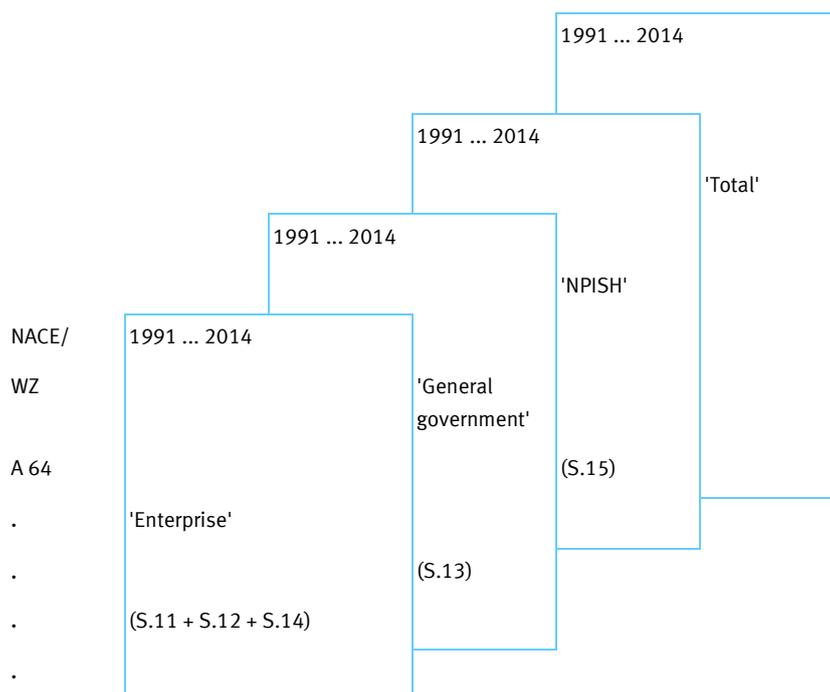
¹⁰ This overview is a simplified version of actual classification.

Industry WZ 2008 classification		S.11 Non-financial corporations	S.12 Financial corporations	S.13 General government	S.14 Households	S.15 Non-profit institutions serving households
O	Public administration and defence; compulsory social security					
P	Education					
Q	Human health and social work activities					
R	Arts, entertainment and recreation					
S	Other service activities n.e.c.					
T	Household services					

3.1.2 Structure of the calculation process

3.11 The structure of the GDP calculation process based on the production approach can also be elicited from the industry/sector matrix (Figure 3-2). On the basis of the available statistical data, a separate calculation is carried out in principle for general government (S.13), financial corporations (S.12) and for non-profit institutions serving households (S.15), as well as for the remaining non-financial enterprise categories (non-financial corporations (S.11) and households (S.14)) initially still consolidated in the production approach, each sector being subdivided by industry in accordance with NACE classification. The output of this sizeable 'residual' category is broken down (within the framework of the sector account) into sectors S.11 and S.14, irrespective of level, chiefly with the aid of statistical data broken down into the various legal forms in which businesses are constituted; S.12 as a further part of an 'enterprise' is already considered separately:

Figure 3–2: Industry/sector matrix



3.1.3 Statistical reference framework

- 3.12 All available business statistics (official and non-official) are used in the national accounts, as well as a wide range of other sources. All available data can and should also be used as further processing statistics for the national accounts. Chapter 10 of this method description provides a more detailed overview of the sources used. It should be mentioned here that the surveys used cover practically all industries, include all units above and beyond a generally low cut-off limit, are carried out regularly (very occasionally with the addition of ad-hoc surveys on highly specific current topics) and are based on administrative data. The latter almost always applies directly at the very least, as most surveys are based on the business register, which is fed by administrative data.
- 3.13 The German 'business register system' (URS/Unternehmensregister-System) is a regularly updated database that was restarted in 2014 with extensive improvements in terms of functionality, up-to-date information and exhaustiveness. The URS covers enterprises and businesses with taxable turnover from supplies and services, and employees liable for payment of social security. The economic structures in Germany can be shown on the basis of evaluations from the business register concerning the number of enterprises and operations and their employees liable for payment of social security and/or turnover. The official statistical system in Germany thus has an efficient tool as support for economic statistics surveys, which also relieves enterprises of their reporting obligations. The URS is maintained in equal parts by the statistical offices of the federal states and by the Federal Statistics Office (destatis).
- 3.14 The business register contains auxiliary indicators (names and addresses), sort indicators (economic activity, legal form, etc.) and size details (turnover, number of employees) for all economically active companies in Germany and their operations. For national accounts, the URS is a central aid for linking statistical data to data from administrative and external sources, as well as partially forming the basis for calculations itself.

The main features are:

- Register ID number
- Name and address in plain text
- Regional code
- Economic activity in accordance with WZ 2008
- Legal form (for legal units)
- Number of employees liable for payment of social security
- Turnover
- References to other registers (ID numbers)
- Enterprise ID number for local units to work out the company-operation context
- Statistics reported by the unit
- Trade characteristics

- 3.15 The starting point for the **creation of the register** was the index of manufacturing units (with approx. 0.6 million units). To these were added the data from the 1995 trades and crafts census and the 1996 census of semi-skilled craft and trade businesses (respectively approx. 0.6 and 0.1 million units). The next step involved incorporating the 1.5 million entries from the register of the wholesale and retail trade and hotels and restaurants, based on the 1993 wholesale, retail and hospitality trade census. This business register system (Unternehmensregistersystem 95 – URS 95) is updated on the basis of information from current surveys and from the statistics relating to applications for the registration of new businesses. Administrative records were used as a third source of data to develop and update the register. The Statistical Register Act (Statistikregistergesetz) provides for regular transmission of the fiscal authorities' VAT records and of the data held by the Federal Employment Agency. To improve quality further still, the records of the chambers of industry and commerce and the guild chambers, as well as the income and corporation tax records of the fiscal authorities, have been integrated into the register.
- 3.16 After a lengthy development phase, the previous database (URS 95) was replaced on 1 July 2014 by the new business register database (**URS-Neu [new URS]**). URS-Neu facilitates the improved maintenance of the business register using administrative, commercially purchased and collected data, more comprehensive support for carrying out surveys and a significant increase in analysis options for the business register itself. For national accounts, these further developments of the business register provide additional future potential and, where necessary, further findings as part of data reconciliation to ensure exhaustiveness (see Chapter 7).
- 3.17 Because the business register is mainly fed and updated by administrative data from the Federal Employment Agency and the fiscal authorities, it can only include units and their characteristics in its records where data on these is supplied by the administrative authorities for a certain reporting year/date. The quality of the data stored in the URS is largely determined by the data situation of the administrative data used for processing and maintenance. The combined records of units and their characteristics (turnover, number of employees) are not quite the entire actual value, as some units are missing, particularly very small ones. Allowances for exhaustiveness are used for these very small units, usually those with turnovers below the threshold for inclusion in VAT statistics (currently EUR 17 500) and without any employees liable for payment of social security. Similarly, allowances are made for all types of units not

recorded for other reasons, i.e. lack of information in the register, failure to comply with registration obligations or deliberate non-registration of units due to the pursuit of illegal activities.

- 3.18 However, the quality of the data in the business register is constantly being improved by the collation of data from different sources and their combined plausibility, facilitating a better approximation of the true value. The data in the business register is subjected to revision on a case-by-case basis if they are updated using information returned from current surveys. In this respect, the business register currently in use is the option offering the best possible accuracy and is suitable as a replacement for the previous usual full surveys.
- 3.19 All the elements of the registration concept are reflected in the production approach to national accounts. The register-based surveys of manufacturing units are used in the same way as those in the other industries, both during the course of the year and on an annual basis. In addition to the major units that are the primary collection basis, the monthly and quarterly surveys also use administrative data in order to reflect results for the smaller units. The administrative data storage used here is fed by advance VAT returns from companies that usually also supply turnover details for the business register on an annual basis.
- 3.20 By contrast, the VAT statistics results from 'Assessments' do not flow regularly into the URS. Nevertheless, the results of VAT assessments are used in many industries as part of national accounts calculations, in order to include allowances for very small units below the annual turnover threshold for inclusion in advance VAT returns, using allowance factors.
- 3.21 The use of administrative data basically means that full surveys are no longer used in the various industries. Data can be compiled on the basis of the URS if a replacement is required for these previous full surveys ('censuses'). This is the case, for example, for the 'trades and crafts census' that was previously carried out regularly as a survey, which is now exclusively based on the URS data (including trade characteristics), and is therefore no longer a primary collection.
- 3.22 As part of the checks for the exhaustiveness of national accounts, a comprehensive reconciliation of business register data with VAT and service statistics was performed for the first time for the 2000 reporting year under the Structural Business Statistics Regulation. Carried out once in the past, the 'employment reconciliation' also served to integrate employment statistics indirectly into the compiling process of national accounts; this integration was taken one step further through the reconciliation of these figures with the employment data contained in population statistics.

3.2 Borderline cases

- 3.23 There are many differences between business accounting and ESA 2010, such as those relating to the valuation of products, the recording of certain processes or the record date. Chapter 21 of ESA 2010 'Links between business accounts and national accounts and the measurement of corporate activity' discusses these relationships in detail. In some borderline cases, these differences have also led to critical reviews and modifications of the recording process for national accounts. Examples of such borderline cases will be highlighted in brief in this chapter, with more detailed descriptions provided in later chapters.
- 3.24 **Mineral exploration** is treated as gross fixed capital formation in ESA 2010, as it was in ESA 1995. Such exploration is of minor significance in Germany, given the comparatively low level of mining activity, and is calculated on a volume times price

approach (here: metre of drilling x price per metre of drilling). The expenditure on mineral exploration calculated in this way is added to capital formation for other fixed assets and the same amount is deducted as business intermediate consumption, with this amount initially being incorporated into the source data for mining businesses. See Chapter 5.10.4 for more information.

- 3.25 **Own-account construction of equipment and buildings** is activated by enterprises if they satisfy the criteria for capital formation (above the current value limit of EUR 150 and use in production for more than a period). Since the major revision of national accounts in 2014 (introduction of ESA 2010), capital formation has been determined in national accounts in line with trade and tax law regulations, ensuring exhaustive recording of such own-account construction of equipment in the national accounts source statistics, and therefore in the national accounts themselves. Own-account construction of buildings, which include both new builds and investment repairs intended to increase value, are calculated on a model basis and recorded exhaustively on both the production and expenditure sides. See Chapters 5.10.1 and 5.10.2 for more details.
- 3.26 **Entertainment, literary and artistic originals** are treated as gross fixed capital formation in ESA 2010, as they were in ESA 1995. Calculations differ depending on the type of original. As part of conceptual changes, corresponding allowances are made for own-account other fixed capital formation on both the production and expenditure sides. See Chapter 5.10.4 for more information.
- 3.27 **Software** is treated as gross fixed capital formation in ESA 2010, as it was in ESA 1995. Calculations are carried out on a model basis, with all due consideration of labour input and other factors, including a mark-up. On the production side, own-account software is added to output and purchased software is deducted from intermediate consumption where necessary. On the expenditure side, software is included in other fixed capital formation. See Chapter 5.10.4 for more information.
- 3.28 Upon the introduction of ESA 2010, **research and development** was incorporated into national accounts as an additional intangible fixed asset, albeit one that is not activated in a business sense. Purchased research and development is therefore deducted from intermediate consumption in all industries except for Research & Development (WZ 72), where purchased research and development is still considered to be of an intermediate consumption nature. This capital formation is calculated using a model, which affects both production and expenditure. See Chapter 5.10.4 for more information.
- 3.29 **Own consumption** of agricultural households is also determined as part of the economic accounts for agriculture and included in results; this also occurs in the other industries, but plays a particularly significant role in agriculture. See Chapter 3.7 for more information.
- 3.30 The **use of dwellings** by the owners themselves is recorded in national accounts as production and consumption, in the same way as own consumption; income streams are also recorded. These indicators are calculated in a complex stratification model in the same way as housing services for third parties. See Chapter 3.18 for more information.
- 3.31 The services of **paid staff** (chauffeur, cook, etc.) are included in national accounts under WZ 97 (services of households as employers). Calculations are based on the compensation paid to these employees. See Chapter 3.26 for more information.
- 3.32 Voluntary services for non-profit institutions serving households (**voluntary assistance with the construction of sports facilities**, etc.) are included in national accounts as

- fictitious activity in the construction industry (WZ F), to improve international comparability. See Chapter 3.12 for more information.
- 3.33 So-called **benefits in kind**, e.g. subsidised train journeys and flights offered to employees by their employers, are also part of compensation of employees. They increase compensation of employees and are deducted from intermediate consumption where they have to be purchased beforehand and are not part of own production.
- 3.34 When goods are exchanged (a process that does not play a major role in Germany), it is assumed that this will be on an equivalent value basis. There is no special allowance for these exchange transactions, if they occur at all.
- 3.35 As the analysis unit in German national accounts is the enterprise, for data availability reasons, transactions and/or **deliveries between the individual businesses** of an enterprise or with ancillary units are not shown. Output and intermediate consumption are shown netted, i.e. not including internal company service flows. Goods that are produced and consumed during the same period within the same company are also not recorded for output and intermediate consumption. This already applies to the source statistics used, which are generally based on turnover, meaning that no adjustment is required in the national accounts. The inclusion of these flows would only increase output and intermediate consumption, while gross value added for the industry and gross domestic product and gross national income in national accounts would not be affected.
- 3.36 **Additions to finished and semi-finished products** are recorded as changes in stocks and affect the result for the relevant period. They have no effect on results in the long term as they balance out over time. This also affects buildings that are completely or partially finished but not yet sold. It also applies in conceptual terms to the so-called 'natural growth' in agriculture and forestry. See Chapter 5.11 for more information.
- 3.37 Questions are asked about 'rentals and rent' in almost all official statistics structure surveys, meaning that these are included in the registered intermediate consumption for enterprises. Expenditure for **operating leasing** is also recorded here, as the leased items are considered to be capital format for the lessor and the lease payments are considered to be intermediate consumption for the lessee. Rent for undeveloped land plays a very minor role in Germany. The usual assumption is that a far larger proportion of rentals and rent is based on real estate, and therefore no deduction of rent for undeveloped land from intermediate consumption is required.
- 3.38 **Small tools** (hammers, screwdrivers, etc.) are below the business value limit for activation, and are also treated as intermediate consumption in national accounts. In general, national accounts in Germany have been geared towards activation by enterprises themselves since the introduction of ESA 2010 (abolition of the value limit of ECU 500 at 1995 prices).
- 3.39 **Contributions to enterprise associations** are viewed as intermediate consumption for member enterprises. Enterprise associations are part of WZ 94 and are included in calculations using the same methods as for non-market producers, given the lack of turnover in the narrower sense; however, they are also part of S.11 and S.12. See Chapter 3.25 for more information.
- 3.40 Only the **service charge** for insurance policies is recorded as intermediate consumption, not the entire premium. In simple terms, the other premium components are only redistributions between the policyholders with and without damages. They balance out overall in business terms, meaning that only the service charge needs to be recorded.

- 3.41 Alongside bank service charges, enterprise costs for banking services include indirectly measured 'costs' relating to the interest margin of the deposit-taking corporations, or so-called financial intermediation services, indirectly measured (**FISIM**). This intermediate consumption is calculated on a model basis and added to the recorded costs in national accounts. See Chapter 3.17 for more information.
- 3.42 Intermediate consumption items that were paid for by employees and reimbursed by their employer are also included in intermediate consumption. For example, this includes **travel and accommodation costs**, queried in structure surveys as 'other costs'.
- 3.43 Where necessary, the products recorded as capital formation in national accounts – such as mineral exploration, research and development, etc. – are deducted from business intermediate consumption. This ensures that no duplicate entries are made under intermediate consumption and capital formation.
- 3.44 As **restoration costs** are usually accrued for units that are no longer active, i.e. units with no or little turnover, they were basically not included in the surveys for the relevant specialised statistics in the 2010 reporting year. Decommissioning costs and allocations to reserves are expressly not to be reported for the electricity, gas, steam and air conditioning supply industry (WZ D); this also prevents incorrect classification as intermediate consumption.

3.3 Valuation

3.3.1 Calculation methods

- 3.45 Various calculation methods are used to determine gross value added depending on whether the statistical units under examination are market producers or non-market producers (see Figure 3–3).

Figure 3–3: Method of calculating gross value added

	Determining gross value added	Determining output	Examples
Market producers	Subtraction method	Turnover method	Non-financial enterprise (normal method)
		Differential method	Deposit-taking corporations, insurance undertakings
		Valuation method	Agriculture, forestry and housing services
Producer for own final use		Valuation at basic prices	Owner-occupiers and users of household services
Non-market producers	Addition method	Addition method	Public administration, non-profit institutions serving households

- a) **Market producers** are units whose output is chiefly marketable (i.e. that is sold on or is intended for sale on the market). In this case, gross value added is determined by deducting the value of intermediate consumption from that of

output (subtraction method). There are various different calculation methods used to calculate **output**:

- **'Turnover method'**: output is determined as the sum of turnover (including drawings for own use), changes in stocks of products from own production and own-account fixed capital formation. This is the procedure that market producers normally adopt.
 - The term **'differential method'** may be used to describe special arrangements adopted by financial enterprises (deposit-taking corporations and insurance undertakings), because in these cases output is calculated as the difference between particular revenue and expenditure items.
 - In the **'valuation method'**, output is calculated through the valuation of quantities (so-called volume/price procedure). This valuation procedure is only used in exceptional cases, e.g. in agriculture and forestry, as well as housing services calculated using a detailed stratification model.
- b) Producers for own final use**, i.e. units whose output is wholly or primarily intended for internal consumption, are a special case. Typical examples are owner-occupiers of dwellings and households paying for domestic services. Once again (as in the case of market production), output is valued at basic prices and gross value added is formally determined by subtracting the value of intermediate consumption. In this context, it should be remembered that production for own final use (own consumption or own-account fixed capital formation) can also occur as the secondary output of a market producer or non-market producer (S.13, S.15). Own-account fixed capital formation is always valued at basic prices here, including a mark-up determined on the basis of the annual accounts statistics compiled by the Deutsche Bundesbank using industry-specific profit rates. The sections on the individual industries go into more detail about the calculation and valuation of production for own use.
- c)** By contrast, in the **non-market producers** category, the bulk of production consists of so-called non-market output that is made available as a rule to other units, either free of charge or at economically insignificant prices. Examples of such producers are public administrative bodies and non-profit institutions serving households. Since no market prices are available for the services rendered free of charge, gross value added and output are determined in these cases by adding together the items from the expenditure side for these units (the addition method). Gross value added is equal to the sum of compensation of employees, consumption of fixed capital and other taxes on production (minus other subsidies). The output is the sum of the gross value added and intermediate consumption. In the absence of any market valuation, values are allocated by the responsible (political and social) decision-making body. There is basically no net operating surplus.

3.3.2 Data situation

3.46 The calculation of gross value added within the framework of the production approach outlined here will generally (i.e. in the case of market production) require data on the output and intermediate consumption of the enterprises grouped together within each industry. The full range of economic statistics that are available from official and unofficial sources is used for this purpose. Most of these statistics have not been produced specifically for the purpose of national accounts, but provide information for other purposes too; in this respect, it is inaccurate to speak of specific 'GDP statistics'. However, close cooperation takes place between specialised statisticians and the

compilers of the German national accounts, and so the national accounts distinctions and definitions are incorporated as far as possible into specialised national statistics and EU regulations (Structural Business Statistics Regulation, Short-Term Statistics Regulation). Currently, the production approach involves the processing of about 150 different statistics when the annual accounts are compiled (and this method description is confined to annual accounting).

Output source data

- 3.47 In practice, the compilers of the production approach avail themselves, in principle, of **primary statistical** data on output and turnover; only when such data are unavailable do they have recourse to secondary statistics, particularly VAT statistics. The core of the process for determining output is formed by the **annual company surveys** that are conducted in most industries in line with the European Structural Business Statistics Regulation. This applies to the manufacturing industry, the trade and transport sectors and business activities. Annual details are also available from the balance sheets of deposit-taking corporations and insurance undertakings. Calculations for agriculture are based on extensive agricultural statistics evaluated as part of the economic accounts for agriculture (EAA). VAT statistics (advance VAT returns and assessments) are normally used for businesses outside the aforementioned categories, taking data from the business registers as a data source for determining output; this applies especially to other service enterprises (with the exception of human health activities, for example). The 'housing services' sector is a special case, with its output (rent value) being determined by means of the volume of housing stock and average rent levels. Financial statistics can be used to calculate gross value added and output for the general government sector, while the main sources of data on non-profit institutions serving households are the data taken from the business register and labour cost survey.
- 3.48 **Statistics published more than once a year** (monthly and quarterly statistics) are used primarily for the quarterly GDP calculations, although they are also taken into account in final annual calculations for the purposes of plausibility checks.
- 3.49 There is generally only limited source data available in terms of the basic prices concept, since, for example, it does not include taxes on products, and subsidies on products also have to be added subsequently. Taxes and subsidies on products are basically taken from financial statistics and are deemed to be cash figures (some of which are time-adjusted). The relevant sections of this chapter will go into more detail about the individual national accounts domains.
- 3.50 Changes in inventories of output products (finished and semi-finished) are valued in line with ESA 2010 regulations, i.e. without paper business profits or losses. These are initially based on structure surveys, whose results are then re-evaluated in line with national accounts concepts.
- 3.51 In all cases, it is ensured that output, not turnover, is what is incorporated into the results of the production approach. In the construction industry, for example, this is carried out by considering annual construction output, not turnover, as the basis for determining output. In other industries, additions to output inventories are added to turnover, meaning that output is always recorded on an accrual basis.
- 3.52 Taxes and subsidies on products are recorded on the date on which the transaction takes place. In the case of taxes, this is ensured using so-called time adjustment by one or two months, adjusting the cash figures in line with the time delay between the transaction and tax receipt on the transaction date. See Chapters 3.28 and 3.29 for more information.

Source data for intermediate consumption

- 3.53 Regulation (EC) No 295/2008 of the European Parliament and of the Council concerning structural business statistics constitutes the international basis of the annual surveys as part of European harmonisation. Its implementation in national law was based, for the calculation of intermediate consumption, on a system of cost structure surveys established early in the 1950s and refined further since then; with the service structure surveys, the appropriate instrument was created, initially for NACE Rev.1.1 Sections I (transport, storage and communication) and K (business activities).
- 3.54 Today, there are structure surveys in most industries. There are currently also a further ten multi-annual surveys in the other service sectors (voluntary until the 1996 reporting year, obligatory since then).
- The **annual** cost structure surveys in industry include enterprises with 20 or more employees, although they are highly representative; the cost structure survey of mining and quarrying and the manufacturing sector, for example, covers about 87% of the total turnover of the industries in question, and there is blanket coverage of enterprises employing 500 or more people. The cost structure survey for electricity, gas and water supply effectively provides blanket coverage of the entire industry. Since the introduction of the aforementioned European Structural Business Statistics Regulation – which specifies coverage of all enterprises in an industry with no cut-off limit – enterprises in industry with fewer than 20 employees have been included within a representative annual sample survey (structure survey). The cost structure survey has now been integrated into the annual surveys for the trade and transport sectors, as a result of the European Structural Business Statistics Regulation.
 - The **multi-annual** statistics on cost structure are random samples based on the business register. They are only compiled on a four-yearly basis and the timing of the collection process is staggered to ease the collectors' workload. Given the relatively small sample size (5% of all enterprises in each of the relevant industries at most) and the uneven spread of returns, their findings undoubtedly carry less weight than those of the structure surveys; nevertheless, as extrapolated samples, they can provide useful source data for determining cost ratios (intermediate consumption ratios). Data from the business register is also used for extrapolation. There are also non-extrapolated sample surveys that can also be used to assess the cost ratios and average values for individual categories of company size. The more heterogeneous the structure of the sample, the less meaningful the results of these surveys become. These figures, which are used internally for the production approach, are therefore also subject to makeshift extrapolation (sometimes on the basis of supplementary estimates). In the years that follow in which there are no cost structure statistics, the approaches for cost ratios (particularly intermediate consumption ratios) remain unchanged in principle, and the results of two survey years are reconciled in the multi-annual revisions of the national accounts.
 - In the few remaining industries where there are **no** entirely suitable official cost structure statistics, the annual accounts of individual institutions can sometimes be used directly, while in other cases an estimate has to be made, based partly on the published annual accounts statistics of public funds, establishments and enterprises or trade association figures or by analogy with the cost structure statistics of economically similar areas.
- 3.55 The 'agriculture' sector is a special case; intermediate consumption of particular items is determined here by means of a combination of statistics from various sources. These calculations are carried out within the framework of the economic accounts for

agriculture compiled by the Federal Ministry of Food and Agriculture (BMEL); processing is carried out by the Federal Office for Agriculture and Food (BLE). The Federal Statistical Office (Destatis) takes the BMEL results and adds its own calculations.

- 3.56 Calculations of intermediate consumption by the 'general government' sector are based on the results of financial statistics, which are also used to determine output. These are the accounting results for the core budgets, single/double entries for extra budgets and single/double entries for other Federal, state and social security funds, establishments and enterprises (EVAS 71712) for the Federal, state and social security sub-sectors, with the latter sub-sector also including the individual social insurance schemes (pension insurance, agricultural pension scheme, statutory health insurance, statutory nursing care insurance, statutory accident insurance, unemployment insurance). For the local government sub-sector, these are the accounting results of the core budgets, single/double entries for extra budgets and single/double entries for other local government/government association funds, establishments and enterprises (EVAS 71717). Annual university financial statistics (EVAS 21371) are also used, where these relate to a university included in the government's extra budget, as well as surveys on the expenditure, income and personnel at public and public-funded scientific and research institutions (EVAS 21811), where the research institution is included in the government's extra budget.
- 3.57 No source data on intermediate consumption are available for non-profit institutions serving households; these figures are primarily assessed through conclusion by analogy with intermediate consumption for similar activities that feature in public budgets.
- 3.58 Valuation of intermediate consumption items purchased in earlier periods and now taken from stock, is carried out at the relevant replacement prices, ensured using a so-called 'paper profit adjustment'. See Chapter 5.11 for more information about this valuation adjustment.

Figure 3–4 provides a summary of the source statistics system, which is also used to calculate intermediate consumption.

Figure 3–4: Source statistics for calculating intermediate consumption (summary)

Details of intermediate consumption	
Structure surveys	Annual cost structure surveys <ul style="list-style-type: none"> • Electricity, gas and water supply • Mining and quarrying • Manufacturing • Construction
	Annual survey of wholesale and retail trade and hotels and restaurants, Service statistics, Four-yearly cost structure statistics <ul style="list-style-type: none"> • Trade • Transport • Information, communications • Business service enterprises • Other service sectors (partial)
Substitution procedure	Special assessment for agriculture, published enterprise balance sheets <ul style="list-style-type: none"> • Agriculture • Telekom AG • Lufthansa AG • Broadcasting institutions • Banking and insurance • Housing services
	Estimate based on comparable economic activities <ul style="list-style-type: none"> • Non-profit institutions serving households
Accounting statistics	Operating expenditure recorded in public budgets <ul style="list-style-type: none"> • National, regional and local authorities • Social security

3.3.3 Time lags

3.59 Various time lags apply to the source data used for the initial calculation of gross value added, referring to the gap between the time when the data become available (internally) and the reporting period. In general, final annual results for all industries can be established at $t + 30$ months, with few exceptions. While the source statistics for many industries are available sooner than this, these industries are automatically included in the macroeconomic balancing of the production approach with the expenditure approach for the valuation of GDP with new accounts deadlines, which means that even their results may still be subject to alteration. In the case of the four-yearly cost structure statistics, the time lag between the year of collection and the year of publication is almost two years. Since these are surveys conducted in a four-year

cycle, the inclusion of these data requires a link to be established between each survey and the previous set of cost structure statistics; this link currently only exists within the framework of the multi-annual revisions of the national accounts. This list also does not show the source statistics for the provisional value added calculations; these figures are frequently updated (on a monthly and/or quarterly basis) and are used in the estimation of quarterly results (mostly published about eight weeks after the end of each quarter) and provisional annual results (first published as early as January of the following year).

- 3.60 There is a time lag of around a year and a half between the major data sources and VAT statistics (advance VAT returns), (cost) structure surveys and annual surveys of the wholesale and retail trade. The four-yearly cost structure statistics for selected service sectors and the business register are available in a usable form for national accounts after about two years. VAT statistics (assessments) have a significant time lag of almost four years after the reporting year. The annual surveys for the transport sector and the few annual reports still used by major corporations are available after around one year.

3.4 Transition from private accounting and administrative concepts to ESA 2010 national accounts concepts

- 3.61 The transition from source statistics results to the published national accounts results is presented in summarised form in the Table 3–3.

Re. (1): The starting point for the calculations is the range of source statistics on output (primary and secondary activities) and intermediate consumption in the various sectors and economic activities. Before they are included in the calculation process, there is an industry-specific comparison of all available sources, taking account of quality criteria such as exhaustiveness, accuracy and time availability. The data sources to be given priority for use are then selected for each industry on the basis of this comparison, and are described in detail in the following chapters. The source data for calculating intermediate consumption incorporate all business cost items; these include raw materials and supplies, as well as lease payments and costs that are relevant for intermediate consumption.

Re. (2): The second step involves comprehensive data validation of the various data sources. For example, where necessary, the source data are adjusted to take account of incorrect attributions to economic sectors, which are corrected after discovering that the details provided by respondents are incorrect and/or supplemented to include units that may belong to the industry after classification of economic activities, but that lie outside the collection/recording scope for source statistics. With some data sources, it may also be necessary to adjust their results in terms of (partial) turnover for a unit, because the unit is already included in a different national accounts sector or industry in line with national accounts concepts. This ensures that possible duplicate records or under-reporting is prevented right from the start of calculations, whether this is in terms of specific sectors or economic activities. Plausibility and exhaustiveness checks are therefore carried out at an early stage during data validation, based on cross-referencing with other data sources and involving specialised statistics experts and national and regional accounts.

Re. (3): Own-account fixed capital formation is added after a sub-total is established, as it is deemed part of output for national accounts, but not commercial turnover.

Table 3–3: Derivation of national accounts results in the production approach

All industries,
Year 2010 in EUR (billions)

No	List	Output	Intermediate consumption	Gross value added
Non-financial corporations and households (S.11/S.14)				
1	Source data	5 763.514	3 992.682	1 770.832
2	+ Data validation	-38.860	2.304	-41.164
	= Sub-total.....	5 724.654	3 994.986	1 729.668
3	+ Own-account fixed capital formation	6.618	1.359	5.259
4	+ Changes in inventories of finished products and work in progress.....	10.665	1.438	9.228
	= National accounts figures	5 741.937	3 997.783	1 744.154
5	+ Adjustments for exhaustiveness (N types)	181.651	56.467	125.185
	= Balance sheet result	5 923.588	4 054.249	1 869.339
6	+ Conceptual changes	-1 855.302	-1 849.371	-5.931
	= National accounts result.....	4 068.286	2 204.878	1 863.408
7	+ Macroeconomic balancing.....	0.000	-50.702	50.702
8	+ FISIM.....	0.000	45.965	-45.965
9	+ Research and development	31.276	-16.056	47.332
	= National accounts result (S.11/S.14)	4 099.562	2 184.085	1 915.477
Financial corporations (S.12)				
	+ National accounts result (S.12)	234.233	129.676	104.557
General government (S.13)				
	+ National accounts result (S.13)	373.164	118.049	255.115
Non-profit institutions serving households (S.15)				
	+ National accounts result (S.15)	69.164	22.618	46.546
Total economy (S.1)				
10	= Published figures	4 776.123	2 454.428	2 321.695

Re. (4): Changes in the inventories of semi-finished and finished products are also added. These changes in inventories are also part of the output, but not the turnover of the period. A sub-total is reached after this adjustment of results to national accounts concepts, marked in the table as 'National accounts figures'.

Re. (5): Extensive adjustments for exhaustiveness are carried out in the next step, including allowances for under-reporting of prostitution, smuggling, drugs and the hidden economy, tips and benefits in kind, ensuring the complete exhaustiveness of national accounts results. See Chapter 7 for a detailed description of these allowances.

Re. (6): Conceptual reclassifications are corrections that are explicitly taken into account when business accounting data are converted into national accounts concepts. These are **conceptual changes** of the relevant baseline values to ESA 2010 regulations.

The conceptual changes lead to significant deviations from the business accounting data. These are initially the recording of the net value of goods bought for resale, i.e. recording output and intermediate consumption without goods for resale, and the introduction of a price concept using valuation at basic prices. Recording the net value of **goods bought for resale** entails reducing the intermediate consumption and output figures for all the relevant industries by the purchase price of the goods (i.e. rather than just reducing these figures for the wholesale and retail trade). Although this has no effect on gross value added, it does alter the ratios of intermediate consumption to output that typify each industry. Besides the goods for resale themselves, similar production processes are also 'netted down', namely the turnover of enterprises reselling energy, gross rents in the housing services sector (deduction of additional fixed charges) and travel agent turnover, which is restricted to their commission. In macroeconomic terms, this netting down reduces total recorded output (including goods for resale) by about 28%, and total intermediate consumption by more than 43%. This presentation method reduces the recorded macroeconomic flow considerably, because it places greater emphasis on the physical product than has hitherto been customary in the German input-output account. In national publications, however, the more market-orientated classification of gross output is also shown because this seems to lend itself better to certain purposes (e.g. comparisons with turnover data from other sources).

According to ESA 2010, output is generally valued at **basic prices** and intermediate consumption at **purchasers' prices**. The basic price is the amount that the producer receives for each unit of a product, excluding any taxes payable on the item in question (product taxes), but including any subsidies received in connection with the product. Taxes or subsidies on products are transactions that depend on the quantity or value of the products produced, and can consequently be integrated directly into company planning. In macroeconomic terms, the deduction of other taxes on products – where available in source data – reduces total output by EUR 18.106 billion in 2010, while the inclusion of subsidies on products increases output by EUR 7.962 billion, meaning a net reduction in output of almost EUR 10 billion. The influence of these conceptual changes that do not affect GDP is also evident in the presentation of accounts for the various industries. The exclusion of taxes on products (e.g. insurance tax, land transfer tax) has the greatest impact on administrative and support service activities and private service providers (betting levies and lottery taxes). The inclusion of subsidies on products has the most conspicuous effect on the transport sector (compensatory payments) and trade (scrapping bonus).

German national accounts apply the relevant regulations of the business accounting system when activating fixed assets. In this respect, there has therefore been no conceptual difference between the business accounting system and national accounts in terms of value limits since the introduction of ESA 2010.

Major investment repairs are recorded and activated in national accounts as capital formation. By contrast, smaller insignificant cosmetic repairs, etc. are treated as part of intermediate consumption and recorded as such.

Changes in inventories are valued at replacement prices; Holding gains and losses are therefore deducted here, unlike in some business consumption methods. Holding gains and losses are therefore valued in line with ESA 2010 regulations.

The insurance premiums paid are changed in line with ESA so that only the service charge is recorded as intermediate consumption; claims payments are therefore deducted from gross premiums.

Expenditure for sports and leisure activities made available by an employer and other 'non-cash benefits' are deducted from intermediate consumption, as these are part of compensation of employees.

The **overall effect of the conceptual changes** for non-financial corporations (S.11) and households (S.14) in 2010 was EUR -5.931 billion.

Figure 3–5 below provides a summary of the effects of the conceptual reclassifications on output, intermediate consumption and gross value added.

Figure 3–5: Conceptual reclassifications in the non-financial corporations, financial corporations and households sectors (S.11, S.12 and S.14) by reclassification type

	Output	Intermediate consumption	Gross value added
Adjustment for output holding gains/losses	+ / –	0	+ / –
Net value of goods bought for resale	–	–	0
Taxes on products	–	0	–
Subsidies on products	+	0	+
Own-account software	+	0	+
Entertainment, literary or artistic originals	+	0	+
Valuation adjustment for own-account fixed capital formation	+	0	+
Output from voluntary activity	+	0	+
Adjustment for input holding gains/losses	0	+ / –	+ / –
Insurance premium (reduction of net premium by 2/3 to service charge)	0	–	+
General government charges	0	+	–
General government concessions	0	+	–
Use of sports and leisure facilities	0	–	+
Mineral exploration	0	–	+

Re. (7): The 'national accounts results' derived after 'conceptual changes' have been carried out are then regularly subjected to macroeconomic balancing of the production and expenditure approaches for GDP and the (reconciled) results are compiled after due consideration of macroeconomic adjustments. In principle, the macroeconomic adjustment is normally distributed in proportion to gross value added as calculated in

the national accounts, and, if the value of output remains unchanged, it is offset by a balancing adjustment to intermediate consumption. This is based on the belief that output is generally covered better in statistical terms than intermediate consumption (see Chapter 6 for details about the reconciliation process).

Re. (8): After macroeconomic balancing, the FISIM for the output of non-market producers and the intermediate consumption of the market producers **and** non-market producers is added. This is done separately for the individual industries. The balance of the adjustments to output and intermediate consumption reveals the impact on gross value added.

Re. (9): The separate presentation of 'Research and development' (R&D) here is a conceptual change that requires separate recording for 2010, on the basis of its significance and new introduction in ESA 2010. As well as being shown separately here, calculations for this item on a model basis are carried out separately and the results are incorporated separately into the production approach. In brief, own-account R&D for market producers is added to output and purchased R&D is deducted from intermediate consumption (except for WZ 72). For non-market producers, consumption of fixed capital for R&D increases output and consumption expenditure, which triggers an increase in GDP.

Re. (10): At the end of the production calculation process, the published national accounts figures are generated on the basis of the derived national accounts results described here in detail for sectors S.11/S.14, plus the national accounts results for sectors S.12, S.13 and S.15.

3.5 The roles of direct and indirect estimation methods, benchmarks and extrapolations

- 3.62 As both of these aspects (direct/indirect and/or with/without extrapolation) can be combined in practice, they are discussed together here in brief; a detailed description is provided in the corresponding industry-specific sections of this chapter. Considered together, they result in qualitative weightings for the individual estimation methods, shown below for the year 2010.
- 3.63 **Direct estimation methods** are defined here as those methods by which the required indicators (output, intermediate consumption) are collected directly in the form of statistical values. Indirect estimation methods, on the other hand, are those in which these indicators are not directly collected, but are instead derived indirectly from other values (generally on the basis of a calculation model). Both methods can involve extrapolation or not, depending on whether the figures for a particular benchmark year are extrapolated or not. All four combinations can theoretically be used to ascertain both the output and the intermediate consumption of the various industries, meaning that a very mixed general picture is produced, especially since numerous other hybrid forms of estimation can occur in practice.
- 3.64 In the production approach in Germany, **combination A** (direct, no extrapolation) is the most frequent form of estimation, i.e. direct statistical source data on output is available from annual surveys (primary or secondary data) and the same applies to intermediate consumption in the major industries.
- 3.65 Direct estimation methods involving extrapolation (**combination B**) occur chiefly in the assessment of intermediate consumption ratios in those industries for which cost structure statistics are only compiled at multi-annual intervals.

- 3.66 Examples of indirect estimation methods with no extrapolation (**combination C**) include the calculations of output in agriculture, forestry and fishing, because data on volume are normally assessed in conjunction with prices here. Another example is the value added calculation in the case of NPISHs. Here, the gross value added is estimated indirectly, on the basis of the number of employees and the wages paid.
- 3.67 An example of an indirect estimation method involving extrapolation (**combination D**) is the calculation of output in the 'housing services' sector where the quantity of housing stock is extrapolated annually, on the basis of a benchmark year, by means of a refined stratified calculation model based on average rents.

3.6 The main approaches to achieving exhaustiveness

- 3.68 Ensuring the exhaustiveness of gross national income (and/or GDP) has been one of the European Commission's and the GNP Committee's main concerns as part of the European-level national accounts harmonisation in recent years. As a result, it has already been used as a key point in the transition to the revised ESA 1995 and has been further improved in the major national accounts revision in 2014 (introduction of ESA 2010). To that end, a whole package of measures has been adopted, and these measures will be summarised again in this section in relation to the 2014 national accounts revision for the production approach. Chapter 7 gives an overview of the measures adopted to secure exhaustiveness.

a) Employment reconciliation

An extensive project was conducted on behalf of Eurostat, the Statistical Office of the European Communities, with a view to 'verifying the exhaustiveness of GNP statistics with the aid of employment data' (final report in June 1996). Wide-ranging comparisons were made between employment data from population statistics and employment data from individual industries for this purpose (insofar as the latter are included in GDP calculations), with a view to identifying any under-reporting. To sum up, although there was no evidence that the overall GDP figure was under-reported, this study produced some valuable findings with regard to individual industries, and these were taken into account in the 1999 national accounts revision. The connection between employment trends and gross domestic product continues to be observed, e.g. within the framework of regular internal national accounts coherence checks and in the source data from the business register, and any resultant findings will be taken into account in any revisions if necessary.

Given the changes in forms of employment over time in Germany (solo self-employment, minor employment, employment relationship within the framework of labour market policy measures), data on hours worked are included in the study as well as a pure comparison of employment, with this working hours data being compiled on an annual and quarterly basis in line with national accounts concepts by the Institute for Employment Research in Nuremberg, in cooperation with the Federal Statistical Office. The data on hours worked have led to valuable findings in terms of the somewhat contradictory and initially incomprehensible developments linking GDP and/or GNI and employment, particularly during the time of financial and economic crisis in 2008/2009 (see also Chapter 7).

b) Input-output reconciliation

In the course of the 2014 national accounts revision, the compilers also processed more information than in the past from the input-output accounts of previous years (particularly 2010), this being information that generally becomes available too late for inclusion in current GDP calculations. The resultant adjustments required in some

industries – e.g. trade – related to both output and intermediate consumption. Overall, these adjustments served to better satisfy the Eurostat requirement that input-output accounts be incorporated into GDP calculations and into the macroeconomic balancing process for the period since the last revision.

c) Reconciliation with the business register

For substantial areas of industry the business register supplies the statistical basis on which to base sampling and extrapolation. It is therefore also an important element of verifying exhaustiveness. However, this state is not optimal in all points, because, for example, not every industry is yet included on the business register, and the register's level of currency would benefit from updating (see also Chapter 7).

d) Reconciliation with VAT statistics

As a further safeguard to guarantee the accuracy of the national accounts, each area in the production approach was also reconciled with figures from the VAT statistics (assessments and advance VAT returns for the current year). In each case, it must be borne in mind that this comparison can be distorted by numerous special provisions of German fiscal law and by categorisation differences between the economic systems. Nevertheless, these comparisons also help to improve the exhaustiveness and plausibility of many of the figures in the national accounts (see also Chapter 7).

e) Special valuations

Besides the broad checks for exhaustiveness referred to above, many areas of the national accounts were subjected to particular scrutiny in order to ensure that their coverage was sufficiently exhaustive. These special assessments were effected by means of reconciliation with specialised data sources, some of them unofficial (relating to activities such as own-account building work, prostitution, private tuition, tips or benefits in kind). For reasons of consistency, the results of the reconciliation with surveys on household budgets were also included in the production approach, particularly in the domains of wholesale and retail trade and of hotels and restaurants.

f) Under-reporting allowances

Based on these exhaustiveness checks, special allowances for under-reporting have been calculated for each area of the production approach for the calculation of GDP (see also Chapter 7). These allowances are an integral part of calculations rather than a separate and autonomous additional account. The sole purpose of these allowances is to ensure the exhaustiveness of the data from which the GDP figure is derived, and they therefore compensate for every possible type of under-reporting (e.g. statistical cut-off limits, other gaps in the statistical system, tax evasion and non-payment of other public charges). This is also the reason why it is not possible simply to infer reliable information about the 'hidden economy' from these allowances made because of under-reporting.

3.7 Agriculture, forestry, fishing (NACE Rev. 2: A)

Table 3–4: Summary of the 'Agriculture, forestry, fishing' publication (NACE Rev. 2 A)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Intermediate consumption	Gross value added				
					Share in				
			in EUR (billions)	in EUR (bn)	GVA in industry	Total GVA	GDP	GNI	in %
1	A	Agriculture, forestry and fishing	45.619	28.919	16.700	100	0.7	0.6	0.6
2	01	Agriculture	41.590	26.712	14.878	89.1	0.6	0.6	0.6
3	02	Forestry	3.651	2.038	1.613	9.7	0.1	0.1	0.1
4	03	Fishing	0.378	0.169	0.209	1.3	0.0	0.0	0.0

3.69 Output and intermediate consumption calculations for agriculture and forestry are mostly carried out by the Federal Ministry of Food and Agriculture (BMEL); processing is carried out by the Federal Office for Agriculture and Food (BLE). The Federal Statistical Office takes the BMEL results and adds its own calculations. The methodological basis for BMEL results is the Manual on the Economic Accounts for Agriculture and Forestry, Rev. 1, which is derived from the ESA.

The characteristic feature of calculations for agriculture and forestry is the product-by-product approach to accounting. The value of crop, livestock and forestry production is not normally assessed directly through the producers, but is instead calculated by assessing the total quantities produced at their respective prices (the volume/price method). Intermediate consumption items in agriculture and forestry are generally so specific (e.g. seed and fertilisers) that they can be attributed very neatly.

In the division agriculture, hunting and related activities as well as in the division forestry, there are statistical units in the sectors of non-financial corporations (S.11), households (S.14) and general government (S.13). See Chapter 3.21 for more information about 'general government' sector calculations. In contrast to the calculations in the other industries in which there are statistical units in several national accounts sectors, the gross value added for the entire industry is not added up as the sum of individual sectors, but is instead determined as a total. The following description encompasses the calculations for the entire industry, i.e. all sectors. The gross value added of the general government sector must be subtracted from it to gain the result for enterprise sectors.

3.7.1 Agriculture, hunting and related activities (NACE 01)

3.70 The national account calculations in the division agriculture are based on the results of the economic accounts for agriculture (EAA) compiled by the Federal Ministry of Food and Agriculture; processing is carried out by the BLE.¹¹ The starting point for the

¹¹ See <http://www.bmelv-statistik.de/de/sectorale-gesamtrechnung/>

Federal Statistical Office calculations comes from the output at producer prices and the intermediate consumption shown in the EAA.

Determining output

3.71 Agricultural production is normally calculated in the EAA using the volume/price method for individual products. The following is a rough guide to the way in which this method may be applied:

- The valuation of the quantity of harvested crops, which is carried out on the basis of the total area sown with each crop and the respective average yields, is often used as a means of determining total crop production. Any losses should be deducted from these figures.
- The valuation of quantities supplied to purchasers and/or users who are required to submit returns (e.g. dairies, abattoirs, sugar refineries, Federal Monopoly Administration for Spirits or export agencies) is used in particular for calculating livestock production. In this context, a check should be carried out on the extent to which estimates are required for own consumption and own-account fixed capital formation, as well as the extent of any changes in inventories.
- Inter-farm deliveries (e.g. seed, animal feed, agricultural services) have to be recorded as output and intermediate consumption according to ESA 2010 and the EAA/forestry accounts manual. Certain internal flows (further production) are also recorded as output and intermediate consumption in the EAA and have to be calculated separately for national accounts. This affects vegetable foodstuffs fed to the farmer's own livestock on the same farm.

Apart from the aforementioned adjustment of output and intermediate consumption to accommodate internal animal feed consumption, other data adjustments are required so as to comply with the concepts, definitions and industry definitions of ESA 2010. The transition from the EAA to national accounts is explained in the following table:

Table 3–5: Output for agriculture, hunting and related activities

Year 2010

WZ 01 Agriculture, hunting and related activities	Output	Share of output
	In EUR (billions)	in %
EAA result at producer prices (1).....	46.086	111.1
– Internal animal feed consumption (2).....	7.370	-17.8
+ Domestic horticultural output (3).....	1.942	4.7
+ Growing of drug crops (4)	0.112	0.3
+ Own-account building construction (5).....	0.607	1.5
– Forest nursery (6).....	0.130	-0.3
+ Hidden economy (7).....	0.287	0.7
= Output at producer prices.....	41.534	100.1
+ Subsidies on products (8).....	0.000	0.0
– Taxes on products (9).....	0.053	-0.1
= Total output at basic price.....	41.481	100.0

- (1) This is the output at producer prices of crop and livestock products, including perennial crops and secondary activities, as defined in the EAA concepts.
- (2) As has already been explained, internal animal feed consumption has to be calculated separately from the EAA figures, because a farm is treated as a statistical unit for national accounts purposes. The formation of technical farm departments as statistical units (local kind-of-activity units) fails due to the fact that it is impossible to determine intermediate consumption, capital formation or compensation of employees for parts of a farm (e.g. for the production of crops on the one hand and for animal products on the other). For this reason, the feeding of own crops represents an addition to work in progress from the viewpoint of the national accounts, and it must be included within that statistical unit. Information on the volume of internal consumption is taken from the EAA.
- (3) As the EAA does not include units that only produce for their own consumption (e.g. domestic gardens and animal husbandry by non-farmers), an allowance is made for these in national accounts. This is based on BMEL estimates covering the following products: fruit, vegetables, flowers and garden plants, eggs, honey.
- (4) Figures for the cultivation of drug crops are based on model calculations for illegal activities. See Chapter 7 for more details.
- (5) Agricultural self-constructed buildings are not included in the EAA. As the national accounts do not assign own-account building construction to separate local kind-of-activity units, the value of such building work is added to the output of the agricultural industry. Agricultural self-constructed buildings are valued as part of the calculation of capital formation in construction. Their value

is estimated primarily by reference to the agricultural construction services carried out by external contractors.

- (6) The economic systematic delineation of agriculture in the EAA differs somewhat from its classification in NACE (and therefore in national accounts as well). Since the BMEL includes forest nurseries in the EAA, and these belong to the forestry sector according to classification by economic activity, a corresponding adjustment has to be made.

The source statistics for calculating the output of forest nurseries was the percentage of the total surface area of all tree nurseries in Germany that was devoted to the cultivation of forestry. These figures originate from the publication 'Fachserie 3 Reihe 3.1.7, Landwirtschaftliche Bodennutzung Baumschulerhebung 2008' by the Federal Statistical Office ('Subject-matter series 3, series 3.1.7, Agricultural land use, tree nursery survey 2008'); the share of forest nurseries comes to approx. 15.0%. As forestry plants cost less than other products of tree nurseries, but require less space, it is assumed that forest nurseries are therefore similar to other tree nurseries in terms of economic yield per unit of surface area. Based on this assumption, the output of forest nurseries is calculated as a proportion of the total output per unit of area of all tree nurseries.

- (7) For service activities illegal employment is not part of the source statistics used. A corresponding allowance is therefore determined and added using model calculations (see Chapter 7).
- (8) No subsidies on products were provided for agriculture in 2010, and such subsidies have been extremely minimal since 2005 in this industry.
- (9) The sugar levy specified in the EAA is included in taxes on products. The spirits duty levied on spirits produced in agricultural establishments is also included.

Determining intermediate consumption

Table 3–6: Intermediate consumption for agriculture, hunting and related activities

Year 2010

WZ 01 Agriculture, hunting and related activities	Intermediate consumption	Share of intermediate consumption
	In EUR (billions)	in %
EAA result at producer prices (1)	32.121	123.2
- Internal animal feed consumption (2)	7.370	-28.3
+ Domestic horticultural production (3)	0.971	3.7
+ Growing of drug crops (4)	0.039	0.1
+ Own-account building construction (5)	0.304	1.2
- Forest nursery (6)	0.065	-0.2
+ Hidden economy (7)	0.072	0.3
= Total intermediate consumption	26.072	100.0

- (1) This is the amount of intermediate consumption as defined in the EAA concept.
- (2) Internal consumption is calculated separately as in the calculation of output.
- (3) Intermediate consumption is increased in line with the allowance for under-reporting in output as recorded in the EAA. Given the lack of information, an intermediate consumption ratio of 50% is assumed for the small businesses not included in the EAA.
- (4) Figures for the cultivation of drug crops are based on model calculations for illegal activities. See Chapter 7 for more details.
- (5) In the case of forest nurseries, an intermediate consumption ratio of 50% was assumed.
- (6) In the case of own-account construction of building, an intermediate consumption ratio of 50% was assumed.
- (7) Intermediate consumption is also calculated in line with the allowance for illegal employment in output.

3.7.2 Forestry and logging (NACE 02)

- 3.72 Gross value added (GVA) for forestry and logging is calculated annually at two-digit heading level (divisions) in line with WZ 2008 and/or NACE Rev. 2 and published in line with WZ special breakdown A*64 in ESA 2010.
- 3.73 According to ESA 2010, the production of forestry products is to be recorded as if it were being produced continuously over the entire growing period. 'Standing timber' is treated as work in progress and the value of its growth during the reference period is to be assessed and recorded as output; in the expenditure approach, this value is recorded as an addition to the stock of work in progress (changes in inventories). For the period when harvesting and/or felling takes place, the stocks in question are to be reallocated from inventories of work in progress to inventories of finished products. Since as a rule timber is sold shortly after being felled, there is normally also a disposal from the inventories of finished goods during the same period (at the level of sales), so that there are basically no stocks or changes in inventories of finished goods.
- 3.74 According to ESA 2010, the value of standing timber is assessed as the discounted value of expected future receipts from the sale of the timber, less expenditure on forestry maintenance until the timber is ready for felling and less the expenses of logging
- 3.75 Forestry output therefore corresponds to annual growth valued at a price recorded in specialised literature as 'earnings net of harvesting costs', plus the harvesting costs for the timber logged during the reference period. Theoretically, the same output can also be expressed as the sum of the felled quantity of timber during the reference period (valued at the 'full' price, i.e. including harvesting costs), plus the unused growth (valued at earnings net of harvesting costs). The unused growth matches the change in the inventory of work in progress.
- 3.76 For the national accounts, results from the national forestry accounts were used as calculated by the Institute of International Forestry and Forest Economics¹². The output of the units lying below the cut-off limit in the forestry accounts was added to the

¹² See <https://www.ti.bund.de/de/wf/projekte/aktualisierung-der-waldgesamtrechnung-wgr/>

forestry accounts results. The forestry nurseries were added as the forest nurseries are contained not in the forestry accounts, but in the EAA.

- 3.77 Forestry services and non-forestry secondary activities were also taken from the forestry accounts. This expenditure among the forestry enterprises represents the income of the forestry service providers.
- 3.78 In the forestry accounts, it is assumed that 10% of businesses with less than 200 ha of forest area are producing exclusively for their own consumption. These businesses are not included in the forestry accounts. They are incorporated into the national accounts with an allowance of 2.5%. This allowance is calculated using internal forestry account data and corresponds to the estimated proportion of the quantity of timber felled for these omitted units. The item 'Collection of wild-growing products (not including wood)' is also included in output. These data were taken from the 2010 VAT statistics (EVAS 73311) for economic activity WZ 02.3. Illegal employment is not part of the source statistics used, particularly for service activities. A corresponding allowance is calculated and added using model calculation (see also Chapter 7).
- 3.79 The national accounts figures for intermediate consumption correspond to the intermediate consumption figures in the forestry accounts, plus an allowance of 2.5% for under-reporting and the estimated intermediate consumption for forest nurseries (see Agriculture). Half the intermediate consumption ratio from the forestry accounts was used for intermediate consumption relating to illegal employment. In the forestry accounts, intermediate consumption is determined on the basis of the results of the pilot scheme statistics, giving due consideration to the different concepts used by the pilot scheme and the forestry and national accounts. Where necessary, information from the pilot scheme statistics is transposed by means of estimates and expert knowledge to the ESA concepts.

The calculations for 2010 are as follows:

Table 3–7: Components of WZ 02 Forestry and logging
Year 2010 in EUR (billions) (national accounts results)

WZ 02 Forestry and logging	Output	Intermediate consumption	Gross value added
Forestry in the narrower sense.....	3.521	1.929	1.592
+ Forest nursery	0.130	0.065	0.065
= Total forestry	3.651	1.994	1.657

3.7.3 Fishing and aquaculture (NACE 03)

- 3.80 In the national accounts, the calculation of gross value added for fishing and aquaculture (NACE 03) is undertaken separately for the two NACE groups of fishing and aquaculture. The following table shows the results for 2010 in the respective prices for both groups in EUR (billions):

Table 3–8: WZ 03 Fishing and aquaculture components

Year 2010 in EUR (billions) (national accounts results)

WZ 03 Fishing and aquaculture	Output	Intermediate consumption	Gross value added
Aquaculture	0.164	0.073	0.091
+ Fishing	0.214	0.092	0.122
= Fishing and aquaculture	0.378	0.165	0.213

- 3.81 The output of **deep sea and coastal fishing** corresponds to catch figures from the report on the landing of fishery products compiled by the Federal Office for Agriculture and Food (BLE).¹³ An allowance of 5% for benefits in kind was used for the deep sea and coastal fishing sector.
- 3.82 Internal earnings data from aquaculture statistics (EVAS 41362) for 2011 (the first time aquaculture statistics were published) were available to calculate output for **aquaculture**. These data were rewritten for 2010 with the percentage growth rate from 2010 to 2011 in the freshwater fishing industry (WZ 2003), which was calculated before the introduction of aquaculture statistics.
- 3.83 An allowance is made in this output figure to take account of the processing of freshwater and farmed fish and other secondary activities. The percentage amount of this allowance is estimated on the basis of data from the VAT statistics regarding the number and turnover of (reporting) enterprises for economic activities 03.2 Aquaculture. It is assumed that none of the average turnover per enterprise in West Germany in 1980 came from secondary activities and that half of each subsequent annual increase in average business turnover has been due to secondary activities.
- 3.84 In terms of deep sea and coastal fishing, intermediate consumption figures are taken from the intermediate consumption specified in the accounting results of the pilot scheme by the Federal Ministry of Food and Agriculture for that sector, with the 2010 intermediate consumption ratio for this sector being around 45.0%; for the deep sea and coastal fishing sector, the average intermediate consumption ratio was determined from the annual reports of the major deep sea fisheries published in the Federal Gazette. This ratio was 43.4% in 2010.
- An average intermediate consumption ratio of 43.9% for fishing was used for the NACE group aquaculture.
- 3.85 The data on deep sea and coastal fishing and on freshwater fishing is used in the following table to determine the output for **fishing and aquaculture** for 2010, shown in column WZ 03 in EUR (billions). The table further shows the figures for agriculture (WZ 01) and forestry (WZ 02) as well as the output for the the Section A as a whole:

¹³ See http://www.ble.de/DE/02_Kontrolle/02_Fischerei/01_Fischwirtschaft/Fischwirtschaft_node.html

Table 3–9: Derivation of output by industry division

Section A: 'Agriculture, forestry and fishing'

Year 2010 in EUR (billions)

List	WZ 01	WZ 02	WZ 03	Section A
	Non-financial corporations and households (S.11/S.14)			
Source data	47.554	4.076	0.348	51.979
+ Data validation	-0.130	0.130	0.000	0.000
= Sub-total	47.424	4.206	0.348	51.979
+ Own-account fixed capital formation	0.000	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress	0.000	0.000	0.000	0.000
= National accounts figures	47.424	4.206	0.348	51.979
+ Adjustments for exhaustiveness (N types)	-4.446	0.181	0.030	-4.235
= Balance sheet result	42.978	4.387	0.378	47.744
+ Conceptual changes	-1.554	-1.106	0.000	-2.660
= National accounts result	41.424	3.281	0.378	45.083
+ Macroeconomic balancing	0.000	0.000	0.000	0.000
+ FISIM	0.000	0.000	0.000	0.000
+ Research and development	0.109	0.000	0.000	0.109
= Output (S.11/S.14)	41.533	3.281	0.378	45.192
	Financial corporations (S.12)			
+ Output (S.12)	0.000	0.000	0.000	0.000
	General government (S.13)			
+ Output (S.13)	0.057	0.370	0.000	0.427
	Non-profit institutions serving households (S.15)			
+ Output (S.15)	0.000	0.000	0.000	0.00
	Total economy (S.1)			
= Published figures	41.590	3.661	0.378	45.619

The following table shows the intermediate consumption for Section A and its corresponding divisions:

Table 3–10: Derivation of intermediate consumption by industry division

Section A: 'Agriculture, forestry and fishing'

Year 2010 in EUR (billions)

List	WZ 01	WZ 02	WZ 03	Section A
	Non-financial corporations and households (S.11/S.14)			
Source data.....	32.336	1.704	0.154	34.194
+ Data validation.....	-0.065	0.065	0.000	0.000
= Sub-total.....	32.271	1.769	0.154	34.194
+ Own-account fixed capital formation.....	0.000	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress.....	0.000	0.000	0.000	0.000
= National accounts figures.....	32.271	1.769	0.154	34.194
+ Adjustments for exhaustiveness (N types).....	-5.985	0.074	0.013	-5.898
= Balance sheet result.....	26.287	1.842	0.167	28.296
+ Conceptual changes.....	-0.576	-0.011	-0.002	-0.589
= National accounts result.....	25.711	1.831	0.165	27.707
+ Macroeconomic balancing.....	0.000	0.000	0.000	0.000
+ FISIM.....	0.698	0.044	0.004	0.746
+ Research and development.....	-0.058	0.000	0.000	-0.058
= Intermediate consumption (S.11/S.14)	26.351	1.875	0.169	28.395
	Financial corporations (S.12)			
+ Intermediate consumption (S.12)	0.000	0.000	0.000	0.000
	General government (S.13)			
+ Intermediate consumption (S.13)	0.361	0.163	0.000	0.524
	Non-profit institutions serving households (S.15)			
+ Intermediate consumption (S.15)	0.000	0.000	0.000	0.000
	Total economy (S.1)			
= Published figures.....	26.712	2.038	0.169	28.919

The following table provides a summary of the output, intermediate consumption and gross value added for Section A 'Agriculture, forestry and fishing':

Table 3–11: Derivation of national accounts results in the production approach

Section A: 'Agriculture, forestry and fishing'

Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
Non-financial corporations and households (S.11/S.14)			
Source data	51.979	34.194	17.785
+ Data validation	0.000	0.000	0.000
= Sub-total	51.979	34.194	17.785
+ Own-account fixed capital formation	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress	0.000	0.000	0.000
= National accounts figures	51.979	34.194	17.785
+ Adjustments for exhaustiveness (N types)	-4.235	-5.898	1.663
= Balance sheet result	47.744	28.296	19.448
+ Conceptual changes	-2.660	-0.589	-2.071
= National accounts result	45.083	27.707	17.376
+ Macroeconomic balancing	0.000	0.000	0.000
+ FISIM	0.000	0.746	-0.746
+ Research and development	0.109	-0.058	0.167
= National accounts result (S.11/S.14)	45.192	28.395	16.797
Financial corporations (S.12)			
+ National accounts result (S.12)	0.000	0.000	0.000
General government (S.13)			
+ National accounts result (S.13)	0.427	0.524	-0.097
Non-profit institutions serving households (S.15)			
+ National accounts result (S.15)	0.000	0.000	0.000
Total economy (S.1)			
= Published figures	45.619	28.919	16.700

3.8 Mining and quarrying (NACE Rev. 2: B)

- 3.86 Gross value added (GVA) for mining and quarrying is calculated annually at two-digit heading level (divisions) in line with WZ 2008 and/or NACE Rev. 2 and published in line with WZ special breakdown A*64 in ESA 2010 (Table 3–12):

Table 3–12: Summary of the 'Mining and quarrying' publication area (NACE Rev. 2 B)

Year 2010									
Serial no	WZ 2008	Industrial classification	Output	Intermediate consumption	Gross value added				
					Share in				
			in EUR (billions)		in EUR (billions)		GVA in industry	Total GVA	GDP
		in %							
1	B	Mining and quarrying.....	12.531	7.230	5.301	100	0.2	0.2	0.2

In terms of sectors, all economic output yielded in this section is exclusively from the non-financial corporations (S.11) and households (S.14) sectors.

Determining output

- 3.87 In the section mining and quarrying r (WZ B), turnover data for enterprises with '20 or more employees' are available from multiple official sources. These include the cost structure survey (KSE) (EVAS 42251), business register (URS) (EVAS 52111), investment survey (IE) (EVAS 42231), enterprise annual reports (JBU) (EVAS 42221), monthly reports for companies (MBB) (EVAS 42111) and VAT statistics (EVAS 73311, 73321).
- 3.88 In terms of national accounts calculations using the production approach, the cost structure survey results are used as this is the only survey that also shows costs by cost type in a suitable way for turnover purposes and takes subsequent reports and corrections into consideration, as well as adjusting incorrect classifications at a later date if necessary, unlike in full surveys such as the investment survey. VAT statistics results can only be used for the purposes of comparison, as they only record the turnover of tax groups subject to VAT¹⁴ in the industry to which the parent company belongs, and the cut-off limit is based on turnover (over EUR 17 500), not number of employees. Due to the fact that they are based on the concept of establishments, the monthly reports for companies cannot replace the cost structure survey (enterprise concept) either, as this would lead to gaps in records (businesses outside WZ B) or duplicate records (businesses run by enterprises from other WZ).
- 3.89 The cost structure survey in manufacturing, mining and quarrying is carried out with a sample of enterprises with 20 or more employees, which is available around May of the current year for the reporting period t-2 years. Broken down at four-digit heading level in line with WZ 2008, the survey queries costs by cost type for the enterprise, as

¹⁴ Under German fiscal law, a tax group is a group of legally independent units that come together to form a tax unit. One or more legally independent units (subsidiary companies) will be incorporated into another legally independent unit (controlling company) in financial, economic and organisational terms. The controlling company represents the entire unit in communications with the tax authorities as the uniform taxpayer.

well as turnover and number of employees. The business register forms the basis for selecting enterprises for the sample survey, comprising almost 18,000 enterprises and therefore approx. 45–50% of the population of enterprises. In terms of turnover, the sample survey covers approx. 87% of the population, while it covers approx. 76% of the population in terms of employees. Enterprises with 500 or more employees are all included here (blanket coverage), while the other enterprise sizes are covered as simple stratified random samples, extrapolated via the investment survey with 20 or more employees. These results are published in subject-matter series 4, series 4.3. 'cost structure survey of manufacturing, and of mining and quarrying enterprises'.

- 3.90 Parallel to this, the annual structure survey (SE) is added to the enterprise size band of 1 to 19 employees, as it exactly connects up with the cost structure survey in terms of enterprise size and is normally available in June of the current year for the reporting period t-2. The business register again provides the sampling frame here for the approx. 6 000 units surveyed, which corresponds to around 3% of the population (enterprises with 1 to 19 employees), and it is then extrapolated to this. Compared to the cost structure survey, however, only selected cost components are surveyed, which is why information missing in the national accounts is calculated using the ratios of the results for the smallest enterprise size band covered by the cost structure survey (20 to 49 employees). The structure survey results are only delivered to Eurostat and made available internally to national accounts; there is no national publication.

Table 3-13 shows the **turnovers** established from the annual cost structure survey, and their components for enterprises with **20 or more employees** in industry sector B:

Table 3–13: Turnover components (20 or more employees)

Year 2010

WZ B Mining and quarrying	Turnover	Share of turnover
	In EUR (billions)	in %
Turnover from own products	10.200	87.0
+ Turnover from goods bought for resale	1.031	8.8
+ Trade commission.....	0.003	0.0
+ Turnover from other activities	0.496	4.2
= Total turnover (KSE)	11.730	100.0

- 3.91 The turnover data for enterprises with **fewer than 20 employees** are compiled on the basis of the annual structure survey of manufacturing, and mining and quarrying.
- 3.92 **Changes in the inventories of work in progress and finished products** from own production and **own-account fixed capital formation** are added to turnover to determine output. Once again, the data for enterprises with 20 or more employees originated from the annual cost structure survey of manufacturing, and mining and quarrying.
- 3.93 To limit the burden imposed on respondents, no explicit questions were asked concerning changes to inventories or own-account fixed capital formation within the structural survey among enterprises with fewer than 20 employees. Data for the smallest enterprise size covered by the cost structure survey (20 to 49 employees) are used as a substitute instead, in order to calculate an allowance for their changes in

inventories and own-account fixed capital formation using the corresponding ratios from the cost structure survey, added to the turnovers from the structure survey.

Table 3–14 shows output for the mining and quarrying sector, consisting of the following components (summary of source statistics not including national accounts-specific adjustments):

Table 3–14: Output components

Year 2010

WZ B Mining and quarrying	Output	Share of output
	In EUR (billions)	in %
Total turnover	13.259	99.7
+ Changes in inventories of work in progress and finished products from own production	- 0.006	0.0
+ Own-account fixed capital formation	0.048	0.4
= Output (cost structure survey, structure survey)	13.301	100.0

3.94 At 99.7%, turnover is by far the most significant component of output. Changes in inventories make almost almost zero percent of output, and own-account fixed capital formation plays only a minor role.

3.95 Once output has been determined for the industries from source statistics, excise duties are adjusted as part of **data validation**. The cost structure survey of enterprises with 20 or more employees and the structure survey of enterprises with 1 to 19 employees covers turnover including excise duties relating to self-produced or traded products (mineral oil, natural gas, wine, sparkling wine, spirits and tobacco), which should not be part of calculations according to the basic price concept. Since the cost structure survey and structure survey query these items separately, direct sector classification and adjustment for these excise duties can be carried out. In industry B, only the industry division WZ 06 Mineral oil, natural gas is affected by data validation. In the transition from gross value added for all industries at basic prices to gross domestic product at market prices, excise duties are added together with other taxes on products on a global basis once again, i.e. not broken down by WZ.

3.96 Once data validation is complete, a series of allowances is required (Table 3–15) for the purposes of **adjustments for exhaustiveness**, listed in brief below and described in more detail in Chapter 7.

Table 3–15: Determining balance sheet result

Year 2010

WZ B Mining and quarrying	Output
	In EUR (billions)
Cost structure survey, 20 or more employees.....	11.769
+ Structure survey, 1 to 19 employees	1.532
= Cost structure survey + structure survey.....	13.301
– Data validation (excise duties).....	- 0.001
= Sub-total.....	13.300
+ Allowance for hidden economy	0.083
+ Allowance for under-reporting (+0.5%)	0.066
+ Adjustment for output book values	- 0.003
+ Adjustment for own-account fixed capital formation (+25%).....	0.012
+ Adjustment for mark-up for own-account fixed capital formation	0.003
= Adjusted nominal balance sheet result	13.461

- 3.97 Hidden economy activities such as illegal employment, unpaid work, etc. are known not to be part of the source statistics used. A corresponding allowance is therefore determined and added using model calculations (see Chapter 7).
- 3.98 The results of various full surveys¹⁵, used to check plausibility, indicated under-reporting for the cost structure survey and/or structure survey, which is why a charge of 0.5% is added to output here.
- 3.99 Revaluing inventories on the basis of price fluctuations for the stored products results in minor deviations in output book values. The difference from collected data is determined and corrected using additional analyses.
- 3.100 From a tax point of view, it tends to be more favourable for enterprises to assign a low value to own-account fixed capital formation. Under-reporting is therefore assumed when calculating output, adjusted with a flat allowance of 25%.
- 3.101 Own-account fixed capital formation should be valued at basic prices so that a mark-up can be taken into account in model calculations.
- 3.102 **Conceptual changes** are then made in the following work step. These are corrections that are explicitly taken into account when business accounting data are converted into national accounts concepts. They are conceptual changes of the relevant baseline values to ESA 2010 regulations. See Chapter 3.4 for a detailed description (Table 3–16):

¹⁵ Census of workplaces, census of crafts and trades, register evaluations of the regional finance offices of the fiscal administration and the Federal Employment Agency.

Table 3–16: National accounts result

Year 2010

WZ B Mining and quarrying	Output
	In EUR (billions)
Adjusted nominal balance sheet result	13.461
of which output/input holding gains/losses	- 0.045
of which net value of goods bought for resale	- 0.900
of which own-account software	0.005
of which valuation adjustment for own-account products and services.....	0.001
+ Total reclassifications	- 0.939
= Nominal national accounts result	12.522

3.103 Once the aforementioned adjustments for exhaustiveness and conceptual changes have been added to output calculations, this provides the output for the individual industry divisions of industry sector B in line with the national accounts concept. These output figures are then adjusted for **special items for transition to gross domestic product**, the so-called ESA-compliant changes (Table 3–17). FISIM and macroeconomic adjustments play no part in output in this industry sector. However, own-account research and development is taken into account as an allowance in output (see Chapter 5.10.4 for more details about research and development calculations).

Table 3–17: Nominal balanced result

Year 2010

WZ B Mining and quarrying	Output
	In EUR (billions)
Nominal national accounts result	12.522
+ FISIM, nominal.....	0.000
+ Research and development, nominal.....	0.009
+ balancing, nominal.....	0.000
= Nominal balanced result	12.531

Determining intermediate consumption

- 3.104 Table 3–18 shows the intermediate consumption for the mining and quarrying section, structured as follows (summary of source statistics):

Table 3–18: Intermediate consumption components

Year 2010

WZ B Mining and quarrying	Intermediate consumption	Share of intermediate consumption	Share of output
	In EUR (billions)	in %	
Material consumption.....	4.492	52.6	33.8
+ Other intermediate consumption.....	4.052	47.4	30.5
= Total intermediate consumption (cost structure survey, structure survey).....	8.544	100.0	64.2

- 3.105 Material consumption covers the cost of consumables and supplies, the input of goods purchased for resale and the cost of hired labour. The other items of intermediate consumption include the cost of other industrial and tradesmen's services (repairs, maintenance and installation or assembly work), rentals and rent and other costs (e.g. insurance premiums, advertising expenses, freight costs and bank charges).
- 3.106 Intermediate consumption is determined on the basis of statistics from the annual cost structure survey on manufacturing, mining and quarrying **for enterprises with 20 or more employees**. These are the only source statistics available that provide a complete record of the cost of the units in WZ B.
- 3.107 Intermediate consumption for enterprises **with fewer than 20 employees** is determined on the basis of statistics from the annual structure survey, which provides details of the individual data situations. Missing components not covered by the structure survey are assessed via a special evaluation in the cost structure survey for the smallest enterprise size covered in the latter (20 to 49 employees) as the proportion of cost types in output. A check is carried out here for each economic activity to see if any significant economies of scale can be derived depending on the number of employees per enterprise, which could then be transferred to the estimated size bands as allowances or deductions where necessary.
- 3.108 **No data validation** is required for intermediate consumption in industry sector B.
- 3.109 The allowances on source statistics – described in detail in Chapter 7 –required as part of **adjustments for exhaustiveness** are presented in Table 3–19.
- 3.110 The intermediate consumptions of the various adjustments for exhaustiveness are usually calculated by multiplying the corresponding output by a suitable intermediate consumption ratio. The intermediate consumption ratio for hidden economy was taken from the smallest enterprise size band 1 to 19. In the event of under-reporting, we imputed the intermediate consumption ratio of size band 1 or more employees.

Table 3–19: Determining balance sheet result

Year 2010

WZ B Mining and quarrying	Intermediate consumption
	In EUR (billions)
Cost structure survey, 20 employees or more	7.657
+ Structure survey, 1 to 19 employees	0.887
= Cost structure survey + structure survey	8.544
- Data validation	0.000
= Sub-total	8.544
+ Allowance for hidden economy	0.053
+ Allowance for under-reporting	0.043
+ Licence fees (mining royalties) WZ 06	- 0.227
+ Adjustment for material consumption (-0.4%)	- 0.019
= Adjusted nominal balance sheet result	8.394

- 3.111 Field and mining royalties are part of intermediate consumption in the cost structure survey/structure survey. However, according to ESA 2010 concepts, these are to be recorded as rent and must therefore be eliminated from the data. Calculations for the general government sector (S.13) are used to determine the required scope of adjustments, plus a charge of approx. 8% in order to also incorporate households as payment recipients.
- 3.112 It is assumed that part the enterprises will record excessive material consumption for tax reasons. A flat allowance of 0.4% is therefore included.
- 3.113 **Conceptual changes** are corrections that are explicitly taken into account when business accounting data are converted into national accounts concepts. They are conceptual changes of the relevant baseline values to ESA 2010 regulations. See Chapter 3.4 for a detailed description (Table 3–20).

Table 3–20: National accounts result

Year 2010

WZ B Mining and quarrying	Intermediate consumption
	In EUR billion
Adjusted nominal balance sheet result	8.394
of which output/input holding gains/losses	0.038
of which net value of goods bought for resale	- 0.900
of which premiums	- 0.029
of which general government charges	0.018
of which use of sports and leisure facilities	- 0.003
of which mineral exploration	- 0.203
+ Total reclassifications	- 1.079
= Nominal national accounts result	7.315

- 3.114 Once the aforementioned adjustments for exhaustiveness and conceptual changes have been added to intermediate consumption calculations, this provides the intermediate consumption for the individual industry divisions of sector B in line with the national accounts concept. These intermediate consumption figures are then adjusted for **special items for transition to gross domestic product**, the so-called ESA-compliant changes (Table 3–21). See Chapter 5.10.4 for more details about research and development calculations, Chapter 3.17 for FISIM and Chapter 6 for macroeconomic adjustments.

Table 3–21: Nominal balanced result

Year 2010

WZ B Mining and quarrying	Intermediate consumption In EUR (billions)
Nominal national accounts result.....	7.315
+ FISIM, nominal	0.068
+ Research and development, nominal	- 0.009
+ Balancing, nominal	- 0.144
= Nominal balanced result	7.230

Deriving gross value added

- 3.115 Gross value added for section B is calculated by subtracting intermediate consumption from output (subtraction method). The gross value added on the basis of the source data (not including allowances and adjustments) is calculated by summarising as follows (Table 3–22):

Table 3–22: Determining gross value added

Year 2010

WZ B Mining and quarrying	Enterprise size categories		
	20 or more	1–19	Total
	In EUR (billions)		
Output	11.769	1.532	13.301
– Intermediate consumption	7.657	0.887	8.544
<i>Intermediate consumption ratio in % of output.....</i>	<i>65.1</i>	<i>57.9</i>	<i>64.2</i>
= Gross value added (cost structure survey, structure survey)	4.112	0.645	4.757

- 3.116 Further additions above and beyond data validation, adjustments for exhaustiveness and conceptual changes are required for the special items for transition to gross domestic product, in order to reach a balanced result. This is determined by subtracting the corresponding values from output calculations and intermediate consumption calculations from one another.

The following table (Table 3–23) provides an overview of national accounts results (WZ B) in the production approach:

Table 3–23: Derivation of national accounts results in the production approach

Section B: 'Mining and quarrying'

Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
	Non-financial corporations and households (S.11/S.14)		
Source data	13.259	8.544	4.715
+ Data validation	-0.001	0.000	-0.001
= Sub-total	13.258	8.544	4.714
+ Own-account fixed capital formation	0.048	0.000	0.048
+ Changes in inventories of finished products and work in progress	-0.006	0.000	-0.006
= National accounts figures	13.300	8.544	4.756
+ Adjustments for exhaustiveness (N types)	0.161	-0.150	0.311
= Balance sheet result	13.461	8.394	5.067
+ Conceptual changes	-0.939	-1.079	0.140
= National accounts result	12.522	7.315	5.207
+ Macroeconomic balancing	0.000	-0.144	0.144
+ FISIM	0.000	0.068	-0.068
+ Research and development	0.009	-0.009	0.018
= National accounts result (S.11/S.14)	12.531	7.230	5.301
	Financial corporations (S.12)		
+ National accounts result (S.12)	0.000	0.000	0.000
	General government (S.13)		
+ National accounts result (S.13)	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)		
+ National accounts result (S.15)	0.000	0.000	0.000
	Total economy (S.1)		
= Published figures	12.531	7.230	5.301

3.9 Manufacturing (NACE Rev. 2: C)

3.117 Gross value added (GVA) for manufacturing is calculated annually at two-digit heading level (divisions) in line with WZ 2008 and/or NACE Rev. 2 and published in line with WZ special breakdown A*64 in ESA 2010 (Table 3–24):

Table 3–24: Summary of the 'Manufacturing' publication area (NACE Rev. 2 C)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					in EUR (billions)	in EUR (billions)	Share in		
			GVA in industry	Total GVA			GDP	GNI	
			in %						
1	C	Manufacturing.....	1566.305	1051.130	515.175	100.0	22.2	20.0	19.6
2	CA	Manufacture of food products, beverages and tobacco products.....	159.167	121.057	38.110	7.4	1.6	1.5	1.4
3	CB	Manufacture of textiles, clothing, leather goods and footwear.....	21.623	14.665	6.958	1.4	0.3	0.3	0.3
4	CC	Manufacture of wood products, paper and printing	80.546	56.339	24.207	4.7	1.0	0.9	0.9
5	16	Manufacture of wood, straw, plaiting and cork products (except furniture) ..	21.526	15.349	6.177	1.2	0.3	0.2	0.2
6	17	Manufacture of pulp, paper and paper products	37.153	27.555	9.598	1.9	0.4	0.4	0.4
7	18	Manufacture of printing products, reproduction of recorded media.....	21.867	13.435	8.432	1.6	0.4	0.3	0.3
8	CD	Manufacture of coke and refined petroleum products.....	62.417	56.914	5.503	1.1	0.2	0.2	0.2
9	CE	Manufacture of chemical products	125.418	84.431	40.987	8.0	1.8	1.6	1.6
10	CF	Manufacture of pharmaceutical products	38.391	17.541	20.850	4.0	0.9	0.8	0.8
11	CG	Manufacture of rubber, plastic, glass, ceramic products, etc.	104.799	67.097	37.702	7.3	1.6	1.5	1.4
12	22	Manufacture of rubber and plastic products.....	65.981	42.532	23.449	4.6	1.0	0.9	0.9
13	23	Manufacture of other non-metallic mineral products	38.818	24.565	14.253	2.8	0.6	0.6	0.5
14	CH	Manufacture of basic metals and fabricated metal products	200.668	138.155	62.513	12.1	2.7	2.4	2.4
15	24	Manufacture of basic metals.....	91.190	73.431	17.759	3.4	0.8	0.7	0.7

Serial no	WZ 2008	Industrial classification	Output	Inter- mediate con- sumption	Gross value added				
					in EUR (billions)	in EUR (billions)	Share in		
			GVA in industry	Total GVA			GDP	GNI	
			in %						
16	25	Manufacture of fabricated metal products.....	109.478	64.724	44.754	8.7	1.9	1.7	1.7
17	CI	Manufacture of computer, electronic and optical products	68.109	37.601	30.508	5.9	1.3	1.2	1.2
18	CJ	Manufacture of electrical equipment	95.728	55.978	39.750	7.7	1.7	1.5	1.5
19	CK	Manufacture of machinery and equipment	200.086	122.984	77.102	15.0	3.3	3.0	2.9
20	CL	Manufacture of transport equipment	327.265	230.62	96.645	18.8	4.2	3.7	3.7
21	29	Manufacture of motor vehicles, trailers and semi-trailers.....	293.051	208.536	84.515	16.4	3.6	3.3	3.2
22	30	Manufacture of other transport equipment.....	34.214	22.084	12.130	2.4	0.5	0.5	0.5
23	CM	Manufacture of furniture and other manufacturing; repair and installation of machinery and equipment.....	82.088	47.748	34.340	6.7	1.5	1.3	1.3
24	31– 32	Manufacture of furniture and other manufacturing	47.092	26.265	20.827	4.0	0.9	0.8	0.8
25	33	Repair and installation of machinery and equipment.....	34.996	21.483	13.513	2.6	0.6	0.5	0.5

In terms of sectors, all economic output in this section is yielded exclusively by the non-financial corporations (S.11) and households (S.14) sectors.

Determining output

- 3.118 In the manufacturing section (WZ C), turnover data for enterprises with '20 or more employees' are available from multiple official sources. These include the cost structure survey (KSE) (EVAS 42251), business register (URS) (EVAS 52111), investment survey (IE) (EVAS 42231), enterprise annual reports (JBU) (EVAS 42221), monthly reports for companies (MBB) (EVAS 42111) and VAT statistics (EVAS 73311, 73321).
- 3.119 In terms of national accounts calculations using the production approach, the cost structure survey results are used as this is the only survey that also shows costs by cost type in a suitable way for turnover purposes and takes subsequent reports and corrections into consideration, as well as adjusting incorrect classifications at a later date if necessary, unlike in full surveys such as the investment survey. VAT statistics results can only be used for the purposes of comparison, as they only record the turnover of tax groups subject to VAT in the industry to which the parent company belongs, and the cut-off limit is based on turnover (over EUR 17 500), not number of employees. Due to the fact that they are based on the concept of establishments, the

monthly reports for companies cannot replace the cost structure survey (enterprise concept) either, as this would lead to gaps in records (businesses outside WZ B) or duplicate records (businesses run by enterprises from other WZ).

- 3.120 The cost structure survey in manufacturing, mining and quarrying is carried out with a sample of enterprises with 20 or more employees, which is available around May of the current year for the reporting period t-2 years. Broken down at four-digit heading level in line with WZ 2008, the survey queries costs by cost type for the enterprise, as well as turnover and number of employees. The business register forms the basis for selecting enterprises for the sample survey, comprising almost 18 000 enterprises, and therefore approx. 45–50% of the population of enterprises. In terms of turnover, the sample survey covers approx. 87% of the population, while it covers approx. 76% of the population in terms of employees. Enterprises with 500 or more employees are all included here (blanket coverage), while the other enterprise sizes are covered as simple stratified random samples, extrapolated via the investment survey with 20 or more employees. These results are published in subject-matter series 4, series 4.3. 'cost structure survey of manufacturing, and of mining and quarrying enterprises'.
- 3.121 Parallel to this, the annual structure survey (SE) is added to the enterprise size band of 1 to 19 employees, as it exactly connects up with the cost structure survey in terms of enterprise size and is normally available in June of the current year for the reporting period t-2. The business register again provides the sampling frame here for the approx. 6 000 units surveyed, which corresponds to around 3% of the population (enterprises with 1 to 19 employees), and it is then extrapolated to this. Compared to the cost structure survey, however, only selected cost components are surveyed, which is why information missing in the national accounts is calculated using the ratios of the results for the smallest enterprise size band covered by the cost structure survey (20 to 49 employees). The structure survey results are only delivered to Eurostat and made available internally to national accounts; there is no national publication.
- 3.122 Table 3–25 shows the **turnovers** determined from the annual cost structure survey and their components for enterprises with **20 or more employees** in section C. The turnover data for enterprises with **fewer than 20 employees** are compiled on the basis of the annual structure survey of manufacturing, and mining and quarrying.

Table 3–25: Turnover components (20 employees or more)

Year 2010

WZ C Manufacturing	Turnover	Share of turnover
	In EUR (billions)	in %
Turnover of own products	1 388.112	84.2
+ Turnover from goods bought for resale	231.736	14.1
+ Trade commission	0.532	0.0
+ Turnover from other activities	27.845	1.7
= Total turnover (KSE)	1 648.225	100.0

- 3.123 **Changes in the inventories of work in progress and finished products** from own production and **own-account fixed capital formation** are added to turnover to determine output. Once again, the data for enterprises with 20 or more employees

originated from the annual cost structure survey of manufacturing, and mining and quarrying.

- 3.124 To limit the burden imposed on respondents, no explicit questions were asked concerning changes to inventories or own-account fixed capital formation within the structural survey among enterprises with fewer than 20 employees. Data for the smallest enterprise size covered by the cost structure survey (20 to 49 employees) are used as a substitute instead, in order to calculate an allowance for their changes in inventories and own-account fixed capital formation using the corresponding ratios from the cost structure survey, added to the turnovers from the structure survey.

Table 3–26 shows output for the manufacturing sector, consisting of the following components (summary of source statistics not including national accounts-specific adjustments):

Table 3–26: Output components

Year 2010

WZ C Manufacturing	Output	Share of output
	In EUR (billions)	in %
Total turnover.....	1 750.131	99.4
+ Changes in inventories of work in progress and finished products from own production.....	7.625	0.4
+ Own-account fixed capital formation	3.213	0.2
= Output (cost structure survey, structure survey).....	1 760.969	100.0

- 3.125 At 99.4%, turnover is by far the most significant component of output. This is followed by changes in inventories (output), with the lowest proportion being own-account fixed capital formation.
- 3.126 Once output has been determined for the industries from source statistics, excise duties are adjusted as part of **data validation**. The cost structure survey of enterprises with 20 or more employees and the structure survey of enterprises with 1 to 19 employees covers turnover including excise duties relating to self-produced or traded products (mineral oil, natural gas, wine, sparkling wine, spirits and tobacco), which should not be part of calculations according to the basic price concept. Since the cost structure survey and structure survey query these items separately, direct sector classification and adjustment for these excise duties can be carried out. The following industry divisions are affected by this data validation: WZ 10 Food products, WZ 11 Manufacture of beverages, WZ 12 Manufacture of tobacco products and WZ 19 Manufacture of refined petroleum products. In the transition from gross value added for all industries at basic prices to gross domestic product at market prices, excise duties are added together with other taxes on products on a global basis once again, i.e. not broken down by WZ.
- 3.127 Once data validation is complete, a series of allowances is required (Table 3–27, with corresponding naming of the economic activities affected by the allowances) for the purposes of **adjustments for exhaustiveness**, listed in brief below and described in more detail in Chapter 7.

Table 3–27: Determining business results

Year 2010

WZ C Manufacturing	Output
	In EUR (billions)
Cost structure survey, 20 employees or more	1 658.605
+ Structure survey, 1 to 19 employees.....	102.364
= Cost structure survey + structure survey	1 760.969
– Data validation (excise duties)	- 46.698
= Sub-total.....	1 714.271
+ Allowance for hidden economy.....	7.021
+ Allowance for under-reporting (+0.5%)	8.804
+ Reconciliation for refined petroleum products WZ 19	0.600
+ Federal Spirits Monopoly Administration WZ 11	0.045
+ Own consumption WZ 10.....	1.010
+ Narcotics WZ 21.....	0.009
+ Adjustment for output book values.....	- 0.016
+ Adjustment for own-account fixed capital formation (+25%)	0.811
+ Adjustment for mark-up for own-account fixed capital formation.....	0.188
= Adjusted nominal balance sheet result	1 732.743

- 3.128 Hidden economy activities such as illegal employment, unpaid work, etc. are known not to be part of the source statistics used. A corresponding allowance is therefore determined and added using model calculations (see also Chapter 7).
- 3.129 The results of various full surveys¹⁶, used to check plausibility, indicated under-reporting for the cost structure survey and/or structure survey, which is why a charge of 0.5% is added to output here.
- 3.130 Internal reconciliation with the input-output account shows that there are inconsistencies between the sources in the refined petroleum products manufacturing sector, corrected using parallel evaluation of production statistics. A corresponding balancing entry is made in intermediate consumption for the raw materials consumed, meaning that the final effect on GDP is neutral.
- 3.131 The Federal Monopoly Administration for Spirits (BfB) in Offenbach is not obliged to participate in the cost structure survey as a unit. Corresponding data is therefore added manually. The body's published annual reports are used as the source.
- 3.132 Experience has shown that self-produced products or products bought for resale in the food industry are removed from the warehouse for consumption purposes. This own

¹⁶ Census of workplaces, census of crafts and trades, register evaluations of the regional finance offices of the fiscal administration and the Federal Employment Agency.

consumption is recorded and added via extrapolation using the assumptions of the regional finance offices of the fiscal administration (OFD).

- 3.133 ESA 2010 requires narcotics production to be included (as part of illegal activities). The data for this sector are determined in a separate model calculation (see Chapter 7).
- 3.134 Revaluing inventories on the basis of price fluctuations for the stored products results in minor deviations in output book values. The difference from collected data is determined and corrected using additional analyses.
- 3.135 From a tax point of view, it tends to be more favourable for enterprises to assign a low value to own-account fixed capital formation. Under-reporting is therefore assumed when calculating output, adjusted with a flat allowance of 25%.
- 3.136 Own-account fixed capital formation should be valued at basic prices so that a mark-up can be taken into account in model calculations.
- 3.137 **Conceptual changes** are then made in the following work step. These are corrections that are explicitly taken into account when business accounting data are converted into national accounts concepts. They are conceptual changes of the relevant baseline values to ESA 2010 regulations. See Chapter 3.4 for a detailed description (Table 3–28):

Table 3–28: National accounts result

Year 2010

WZ C Manufacturing	Output
	In EUR (billions)
Adjusted nominal balance sheet result	1 732.743
of which output/input holding gains/losses.....	- 2.980
of which net value of goods bought for resale	- 191.739
of which taxes on products.....	- 0.013
of which subsidies on products.....	0.610
of which own-account software	1.454
of which valuation adjustment for own-account products and services	0.077
+ Total reclassifications.....	- 192.591
= Nominal national accounts result	1 540.152

- 3.138 Once the aforementioned adjustments for exhaustiveness and conceptual changes have been added to output calculations, this provides the output for the individual industry divisions of section C in line with the national accounts concept. These output figures are then adjusted for **special items for transition to gross domestic product**, the so-called ESA-compliant changes (Table 3–29). FISIM and macroeconomic adjustments play no part in output in this section. However, own-account research and development is taken into account as an allowance in output (see Chapter 5.10.4 for more details about research and development calculations).

Table 3–29: Nominal balanced result

Year 2010

WZ C Manufacturing	Output
	In EUR (billions)
Nominal national accounts result	1 540.152
+ FISIM, nominal.....	0.000
+ Research and development, nominal.....	26.153
+ Balancing, nominal.....	0.000
= Nominal balanced result	1 566.305

The table 3–30 shows the individual work steps for determining output by selected divisions in section C once again.

Table 3–30: Derivation of output by industry division

Section C: 'Manufacturing' (S.1)

Year 2010 in EUR (billions)

List	CE	CH	CJ	CK	CL	Other WZ	Section C
	Non-financial corporations and households (S.11/S.14)						
Source data.....	149.433	204.921	105.666	209.941	359.205	720.965	1 750.131
+ Data validation.....	0.000	0.000	0.000	0.000	0.000	-46.698	-46.698
= Sub-total.....	149.433	204.921	105.666	209.941	359.205	674.267	1 703.433
+ Own-account fixed capital formation.....	0.353	0.299	0.289	0.692	0.775	0.805	3.213
+ Changes in inventories of finished products and work in progress.....	0.797	2.793	0.520	1.910	0.389	1.216	7.625
= National accounts figures...	150.583	208.013	106.475	212.543	360.369	676.288	1 714.271
+ Adjustments for exhaustiveness (N types) ...	1.199	2.156	1.021	2.210	2.945	8.941	18.472
= Balance sheet result.....	151.782	210.169	107.496	214.753	363.314	685.229	1 732.743
+ Conceptual changes.....	-28.606	-10.419	-12.259	-18.357	-46.067	-76.883	-192.591
= National accounts result....	123.176	199.750	95.237	196.396	317.247	608.346	1 540.152
+ Macroeconomic balancing .	0.000	0.000	0.000	0.000	0.000	0.000	0.000
+ FISIM.....	0.000	0.000	0.000	0.000	0.000	0.000	0.000
+ Research and development	2.242	0.918	0.491	3.690	10.018	8.794	26.153
= Output (S.11/S.14)	125.418	200.668	95.728	200.086	327.265	617.140	1 566.305
	Financial corporations (S.12)						
+ Output (S.12)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	General government (S.13)						
+ Output (S.13)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)						
+ Output (S.15)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total economy (S.1)						
= Published figures.....	125.418	200.668	95.728	200.086	327.265	617.140	1 566.305

Determining intermediate consumption

3.139 Table 3–31 shows the intermediate consumption for the manufacturing industry, structured as follows (summary of source statistics).

3.140 Material consumption covers the cost of consumables and supplies, the input of goods purchased for resale and the cost of hired labour. The other items of intermediate

consumption include the cost of other industrial and tradesmen's services (repairs, maintenance and installation or assembly work), rentals and rent and other costs (e.g. insurance premiums, advertising expenses, freight costs and bank charges).

- 3.141 Intermediate consumption is determined on the basis of statistics from the annual cost structure survey on manufacturing **for enterprises with 20 or more employees**. These are the only source statistics available that provide a complete record of the cost of the units in WZ C.

Table 3–31: Intermediate consumption components

Year 2010

WZ C Manufacturing	Intermediate consumption	Share of intermediate consumption	Share of output
	In EUR (billions)	in %	
Material consumption	1 018.473	81.5	57.8
+ Other intermediate consumption.....	231.250	18.5	13.1
= Total intermediate consumption (cost structure survey, structure survey).....	1 249.723	100.0	71.0

- 3.142 Intermediate consumption for enterprises **with fewer than 20 employees** is determined on the basis of statistics from the annual structure survey, which provides details of the individual data situations. Missing components not covered by the structure survey are assessed via a special evaluation in the cost structure survey for the smallest enterprise size covered in the latter (20 to 49 employees) as the proportion of cost types in output. A check is carried out here for each economic activity to see if any significant economies of scale can be derived depending on the number of employees per enterprise, which could then be transferred to the estimated size bands as allowances or deductions where necessary.
- 3.143 **No data validation** is required for intermediate consumption in industry sector C.
- 3.144 The following allowances on source statistics – described in detail in Chapter 7 – are required as part of **adjustments for exhaustiveness** (Table 3–32).
- 3.145 The intermediate consumptions of the various adjustments for exhaustiveness are usually calculated by multiplying the corresponding output by a suitable intermediate consumption ratio. The intermediate consumption ratio for hidden economy is taken from the smallest enterprise size band 1 to 19. In the event of under-reporting, the intermediate consumption ratio of size band 1 or more employees is imputed.
- 3.146 As already mentioned for output, in the 'Manufacture of coke and refined petroleum products' industry sector, a corresponding balancing entry is made in intermediate consumption for the raw materials consumed, in order to clear up any inconsistencies.
- 3.147 Intermediate consumption for the Federal Spirits Monopoly Administration is originally taken from the annual report by the Federal Monopoly Administration for Spirits (BfB).
- 3.148 Field and mining royalties (concession levy) are part of intermediate consumption in the cost structure survey/structure survey. However, according to ESA 2010 concepts, these are to be recorded as rent and must therefore be eliminated from the data. Calculations for the general government sector (S.13) are used to determine the required scope of adjustments, plus a charge of approx. 8% in order to also incorporate households as payment recipients.

Table 3–32: Determining business results

Year 2010

WZ C Manufacturing	Intermediate consumption
	In EUR (billions)
Cost structure survey, 20 employees or more.....	1 189.159
+ Structure survey, 1 to 19 employees	60.564
= Cost structure survey + structure survey.....	1 249.723
– Data validation.....	0.000
= Sub-total.....	1 249.723
+ Allowance for hidden economy	4.389
+ Allowance for under-reporting.....	6.250
+ Reconciliation for refined petroleum products WZ 19.....	0.600
+ Federal Spirits Monopoly Administration WZ 11.....	0.100
+ Licence fees (mining royalties) WZ 19.....	- 0.441
+ Narcotics WZ 21	0.003
+ Adjustment for material consumption (-0.4%)	- 4.108
= Adjusted nominal balance sheet result	1 256.516

- 3.149 Intermediate consumption for the inclusion of narcotics production is calculated using a separate model calculation, based on the intermediate consumption ratio for WZ 21 Manufacture of basic pharmaceutical products and pharmaceutical preparations.
- 3.150 It is assumed that part of the enterprises will record excessive material consumption for tax reasons. A flat allowance of 0.4% is therefore included.
- 3.151 **Conceptual changes** are corrections that are explicitly taken into account when business accounting data are converted into national accounts concepts. They are conceptual changes of the relevant baseline values to ESA 2010 regulations. See Chapter 3.4 for a detailed description (Table 3–33):

Table 3–33: National accounts result

Year 2010

WZ C Manufacturing	Intermediate consumption
	In EUR (billions)
Adjusted nominal balance sheet result	1 256.516
<i>of which output/input holding gains/losses</i>	3.752
<i>of which net value of goods bought for resale</i>	- 191.739
<i>of which premiums</i>	- 1.952
<i>of which general government charges</i>	2.484
<i>of which use of sports and leisure facilities</i>	- 0.072
+ Total reclassifications	- 187.527
= Nominal national accounts result	1 068.989

3.152 Once the aforementioned adjustments for exhaustiveness and conceptual changes have been added to intermediate consumption calculations, this provides the intermediate consumption for the individual industry divisions of sector C in line with the national accounts concept. These output figures are then adjusted for **special items for transition to gross domestic product**, the so-called ESA-compliant changes (Table 3–34). See Chapter 5.10.4 for more details about research and development calculations, Chapter 3.17 for FISIM and Chapter 6 for macroeconomic adjustments.

Table 3–34: Nominal balanced result

Year 2010

WZ C Manufacturing	Intermediate consumption
	In EUR (billions)
Nominal national accounts result	1 068.989
+ FISIM, nominal	8.677
+ Research and development, nominal	- 13.536
+ Balancing, nominal	- 13.000
= Nominal balanced result	1 051.130

The following table 3–35 shows the individual work steps for determining intermediate consumption by selected industry divisions in Section C once again.

Table 3–35: Derivation of intermediate consumption by industry division

Section C: 'Manufacturing' (S.1)

Year 2010 in EUR (billions)

List	CE	CH	CJ	CK	CL	Other WZ	Section C
	Non-financial corporations and households (S.11/S.14)						
Source data	113.069	146.979	69.349	141.438	282.373	496.515	1 249.723
+ Data validation	0.000	0.000	0.000	0.000	0.000	0.000	0.000
= Sub-total.....	113.069	146.979	69.349	141.438	282.373	496.515	1 249.723
+ Own-account fixed capital formation.....	0.000	0.000	0.000	0.000	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress	0.000	0.000	0.000	0.000	0.000	0.000	0.000
= National accounts figures	113.069	146.979	69.349	141.438	282.373	496.515	1 249.723
+ Adjustments for exhaustiveness (N types).....	0.417	0.758	0.392	0.849	1.154	3.223	6.793
= Balance sheet result	113.486	147.737	69.741	142.287	283.527	499.738	1 256.516
+ Conceptual changes	-27.829	-8.864	-12.164	-17.804	-46.084	-74.782	-187.527
= National accounts result.....	85.657	138.873	57.577	124.483	237.443	424.956	1 068.989
+ Macroeconomic balancing.....	-1.035	-1.680	-1.039	-1.984	-2.202	-5.060	-13.000
+ FISIM.....	0.649	1.152	0.507	1.065	1.703	3.601	8.677
+ Research and development	-0.840	-0.190	-1.067	-0.580	-6.324	-4.535	-13.536
= Intermediate consumption (S.11/S.14).....	84.431	138.155	55.978	122.984	230.620	418.962	1 051.130
	Financial corporations (S.12)						
+ Intermediate consumption (S.12).....	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	General government (S.13)						
+ Intermediate consumption (S.13).....	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)						
+ Intermediate consumption (S.15).....	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total economy (S.1)						
= Published figures	84.431	138.155	55.978	122.984	230.620	418.962	1 051.130

Deriving gross value added

- 3.153 Gross value added for Section C is calculated by subtracting intermediate consumption from output (subtraction method). The 'balance sheet' result (not including allowances and adjustments) for gross value added is calculated by summarising as follows (Table 3–36):

Table 3–36: Determining gross value added

Year 2010

WZ C Manufacturing	Enterprise size band		
	20 or more	1–19	Total
	In EUR (billions)		
Output.....	1 658.605	102.364	1 760.969
– Intermediate consumption	1 189.159	60.564	1 249.723
<i>Intermediate consumption ratio in % of output.....</i>	<i>71.7</i>	<i>59.2</i>	<i>71.0</i>
= Gross value added (cost structure survey, structure survey)	469.446	41.800	511.246

- 3.154 Further additions above and beyond data validation, adjustments for exhaustiveness and conceptual changes are required for the special items for transition to gross domestic product, in order to reach a balanced result. This is determined by subtracting the corresponding values from output calculations and intermediate consumption calculations from one another.

The following table shows the results for output, intermediate consumption and gross value added, summarised by individual calculation step for Section C.

Table 3–37: Derivation of national accounts results in the production approach

Section C: 'Manufacturing' (S.1)

Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
	Non-financial corporations and households (S.11/S.14)		
Source data.....	1 750.131	1 249.723	500.408
+ Data validation.....	-46.698	0.000	-46.698
= Sub-total.....	1 703.433	1 249.723	453.710
+ Own-account fixed capital formation.....	3.213	0.000	3.213
+ Changes in inventories of finished products and work in progress.....	7.625	0.000	7.625
= National accounts figures.....	1 714.271	1 249.723	464.548
+ Adjustments for exhaustiveness (N types).....	18.472	6.793	11.679
= Balance sheet result.....	1 732.743	1 256.516	476.227
+ Conceptual changes.....	-192.591	-187.527	-5.064
= National accounts result.....	1 540.152	1 068.989	471.163
+ Macroeconomic balancing.....	0.000	-13.000	13.000
+ FISIM.....	0.000	8.677	-8.677
+ Research and development.....	26.153	-13.536	39.689
= National accounts result (S.11/S.14).....	1 566.305	1 051.130	515.175
	Financial corporations (S.12)		
+ National accounts result (S.12).....	0.000	0.000	0.000
	General government (S.13)		
+ National accounts result (S.13).....	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)		
+ National accounts result (S.15).....	0.000	0.000	0.000
	Total economy (S.1)		
= Published figures.....	1 566.305	1 051.130	515.175

3.10 Electricity, gas, steam and air conditioning supply (NACE Rev. 2: D)

3.155 Section D corresponds to the electricity, gas, steam and air conditioning supply division (WZ 35) in accordance with NACE Rev. 2 and/or WZ 2008, as this section only covers one division. National accounts results are published in line with the special national accounts breakdown A*64 in NACE Rev. 2 for Section D.

For the purposes of the input-output accounts and environmental-economic accounts, calculations according the production approach for this section are broken down further into groups (WZ 35.1 Electricity supply, WZ 35.2 Gas supply and WZ 35.3 Steam and air conditioning supply). The same calculation methods are used for all three industry groups within the electricity, gas, steam and air conditioning supply division.

Viewed across all national accounts sectors, Table 3–37 shows the results of the production approach for Section D (WZ 35) in 2010.

Table 3–38: Summary of the 'Electricity, gas, steam and air conditioning supply' publication area (NACE Rev. 2 D)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					Share in				
			in EUR (billions)	in EUR (billions)	GVA in industry	Total GVA	GDP	GNI	
1	D	Electricity, gas, steam and air conditioning supply.....	137.077	81.044	56.033	100	2.4	2.2	2.1

In terms of sectors, all economic output yielded in this section is exclusively from the non-financial corporations (S.11) and households (S.14) sectors.

Determining output

- 3.156 Turnover data are available from multiple official sources to determine output for all three industry groups in sector D. These are VAT statistics (advance VAT returns and time-delayed assessments), the statistical business register and, as specialised statistics, the cost structure survey for enterprises involved in electricity and gas supply, water supply, sewerage, waste management and remediation activities.
- 3.157 By weighing up the quality criteria such as exhaustiveness, accuracy, time availability and ESA-compliant use, the aforementioned cost structure survey was selected as the main source of statistics to be used to calculate output for the individual industry groups in the electricity, gas, steam and air conditioning supply industry division.
- 3.158 As well as ensuring more accurate demarcation of the electricity, gas, steam and air conditioning supply industry division into sectors, the cost structure survey is also used because, in comparison to the two other sources, it is the only survey that lists not only turnover data, but also the costs by cost type for the individual industry groups in sector D.

- 3.159 The cost structure survey in the fields of energy and water supply (EVAS 43221) is carried out with around 3 000 supply enterprises in the sense of Section 2 of the Second Act to Reform the German Energy Management Law (2. Gesetz zur Neuregelung des Energiewirtschaftsgesetzes) and energy supply enterprises that have their own generating plants within their enterprise or group of enterprises. Operators of plants generating electricity from renewable energies that feed the electricity they generate into the general supply network in line with the Renewable Energies Act (Erneuerbaren Energien Gesetz) and do not fall under the aforementioned definition are not included in the survey in order to limit the burden on respondents. However, the value of the electricity volumes fed into the general supply network is included in the use of bought-in energy and in the turnovers of network operators. These results are published in subject-matter series 4, series 6.1. 'Industry: Employees, turnover, investments and cost structure of enterprises involved in electricity and gas supply, water supply, sewerage, waste management and remediation activities'.
- 3.160 Even though the turnover data in the cost structure survey are used as the main source for calculating output in all three industry divisions in sector D, the results of all the other aforementioned sources are continuously observed, analysed and compared to the main source used, in order to check exhaustiveness.
- 3.161 Once the turnover data in the cost structure survey has been used to determine the main data source to be used to calculate output, the source data are subjected to **data validation** in the next work step. The excise duties included in the results of the cost structure survey will be deducted in order to render results in basic prices in all three industry groups as part of this validation. The cost structure survey asks explicitly about excise duties, and they can therefore be deducted for each economic activity directly from the cost structure survey results. In the transition from gross value added for all industries at basic prices to gross domestic product at market prices, these excise duties are added together with other taxes on products on a global basis once again, i.e. not broken down by economic activity.
- 3.162 Own-account fixed capital formation and changes in inventories of work in progress and finished products (output) are then added to the turnover data previously calculated from the cost structure survey. The calculation of both indicators is based on the corresponding results from the cost structure survey.
- 3.163 In order to ensure **exhaustiveness in line with ESA 2010**, the next work step involves further adjustments, some of which cover all three industry groups in sector D (see Chapter 7 for details). All three industry groups are affected by an under-reporting allowance for own-account fixed capital formation, attributable to the fact that enterprises in the electricity, gas, steam and air conditioning supply industry division tend not to activate own-account fixed capital formation for tax reasons; instead, they record these as costs (intermediate consumption) for the same period. This is why a flat allowance of 25% is added to the own-account fixed capital formation data in the cost structure survey for each industry group in sector D. A valuation adjustment is also applied to own-account fixed capital formation, with a mark-up as part of adjustments for exhaustiveness.
- 3.164 In the electricity supply industry (WZ 35.1), an allowance is also applied for renewable energies generated by households, as the results of the cost structure survey only include electricity generation by energy supply companies in the sense of Section 2 of the Second Act to Reform the German Energy Management Law and energy supply enterprises that have their own generating plants within their enterprise or group of enterprises; electricity generated by households from renewable energy sources is therefore basically not included in the cost structure survey. This adjustment for exhaustiveness is based on data on reimbursements to households for electricity fed into the general supply network from small solar power, wind power or biomass plants.

The data sources for this are the statistics reports compiled by the Federal Network Agency based on the Renewable Energies Act (EEG), the annual accounts of the information platform for German network operators and annual surveys of small plants up to 500 kW belonging to Solarenergie-Fördervereins Deutschland e.V. In 2010, the allowance was EUR 2.802 billion.

- 3.165 Once the aforementioned adjustments for exhaustiveness have been added to output, this provides the output for the individual industry groups in sector D in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts, e.g. recording the net value of goods bought for resale. **Own-account research and development** is also to be taken into account for the non-financial corporations sector in terms of further ESA-compliant implementation (see Chapter 5.10.4 for more details about research and development calculations).

Table 3–39 shows the individual work steps for determining output for the three industry groups in sector D for the integrated sectors of non-financial corporations and households (S.11/S.14) once again.

Determining intermediate consumption

- 3.166 The calculation of **intermediate consumption** for all three industry groups in section D for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output.
- 3.167 Intermediate consumption is determined using the results of the annual cost structure survey in the fields of energy supply, water supply, sewerage, waste management and remediation activities. These statistics contain all expenditure (costs) reported by the enterprises, broken down into survey characteristics relevant to the production approach, e.g. material consumption, use of goods (use of bought-in electricity, gas and water for further distribution and use of goods bought for resale), expenditure for bought-in services (e.g. repairs, maintenance, installation and assembly, costs for third-party operation and waste disposal, expenditure for the disposal of fuel residues by third parties), costs for non-industrial services (rentals and rent, other costs such as testing, consultancy and legal costs, postage charges, telephone charges) and agency worker costs.
- 3.168 Economic activity-specific intermediate consumption ratios are derived from the cost structure survey data for the electricity, gas, steam and air conditioning supply industry division via the reported expenditure and turnover data.
- 3.169 The national accounts source data for intermediate consumption for each industry group is determined by multiplying the industry sector-specific intermediate consumption ratios by the output determined on the basis of cost structure statistics.
- 3.170 A flat allowance of 0.4% is included in the economic activity-specific intermediate consumption ratios as part of the **adjustments for exhaustiveness**. This adjustment is based on the assumption that enterprises record private withdrawals as intermediate consumption to reduce profits for tax reasons, thereby recording excessive intermediate consumption in the cost structure survey. Corresponding intermediate consumption is also calculated for the adjustment allowance for output for the renewable energies generated by households in WZ sector 35.1. This is based on half the corresponding sector-specific intermediate consumption ratio in the cost structure survey, not including goods bought for resale. This process is based on the assumption that household intermediate consumption with smaller renewable energy sources is lower than intermediate consumption by the major energy enterprises included in the cost structure survey. Intermediate consumption for this adjustment for

exhaustiveness is calculated by multiplying the modified intermediate consumption ratio for renewable energies by the corresponding allowance in output.

Table 3–39: Derivation of output by industry division
Section D: 'Electricity, gas, steam and air conditioning supply'

Year 2010 in EUR (billions)

List	WZ 35.1/3	WZ 35.2	Section D
	Non-financial corporations and households (S.11/S.14)		
Source data	370.275	56.607	426.882
+ Data validation	-0.037	-0.006	-0.043
= Sub-total.....	370.238	56.601	426.839
+ Own-account fixed capital formation	0.575	0.038	0.613
+ Changes in inventories of finished products and work in progress	0.024	-0.025	-0.001
= National accounts figures	370.837	56.614	427.451
+ Adjustments for exhaustiveness (N types)	2.980	0.012	2.992
= Balance sheet result	373.817	56.626	430.443
+ Conceptual changes	-249.330	-44.073	-293.403
= National accounts result.....	124.487	12.553	137.040
+ Macroeconomic balancing.....	0.000	0.000	0.000
+ FISIM.....	0.000	0.000	0.000
+ Research and development	0.037	0.000	0.037
= Output (S.11/S.14).....	124.524	12.553	137.077
	Financial corporations (S.12)		
+ Output (S.12).....	0.000	0.000	0.000
	General government (S.13)		
+ Output (S.13).....	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)		
+ Output (S.15).....	0.000	0.000	0.000
	Total economy (S.1)		
= Published figures	124.524	12.553	137.077

3.171 Once the **conceptual changes** have been added to intermediate consumption, this provides the intermediate consumption for each industry division in line with national accounts concepts. In order to transpose the data to published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see

Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10.4).

Table 3–40 shows a summary of the individual intermediate consumption calculation phases for industry sector D once again.

Table 3–40: Derivation of intermediate consumption by industry division

Section D: 'Electricity, gas, steam and air conditioning supply'

Year 2010 in EUR (billions)

List	WZ 35.1/3	WZ 35.2	Section D
	Non-financial corporations and households (S.11/S.14)		
Source data	320.032	51.640	371.672
+ Data validation	0.000	0.000	0.000
= Sub-total	320.032	51.640	371.672
+ Own-account fixed capital formation	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress	0.000	0.000	0.000
= National accounts figures	320.032	51.640	371.672
+ Adjustments for exhaustiveness (N types)	-0.464	-0.207	-0.671
= Balance sheet result	319.568	51.433	371.001
+ Conceptual changes	-245.345	-43.731	-289.076
= National accounts result	74.223	7.702	81.925
+ Macroeconomic balancing	-1.387	-0.134	-1.521
+ FISIM	0.650	0.065	0.715
+ Research and development	-0.075	0.000	-0.075
= Intermediate consumption (S.11/S.14)	73.411	7.633	81.044
	Financial corporations (S.12)		
+ Intermediate consumption (S.12)	0.000	0.000	0.000
	General government (S.13)		
+ Intermediate consumption (S.13)	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)		
+ Intermediate consumption (S.15)	0.000	0.000	0.000
	Total economy (S.1)		
= Published figures	73.411	7.633	81.044

Deriving gross value added

3.172 Gross value added for Section D is calculated by subtracting intermediate consumption from output (subtraction method), which is generally used for market production.

The following table shows the results for output, intermediate consumption and gross value added, summarised by individual calculation step for Section D once again.

Table 3–41: Derivation of national accounts results in the production approach
Section D: 'Electricity, gas, steam and air conditioning supply'
Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
Non-financial corporations and households (S.11/S.14)			
Source data	426.882	371.672	55.210
+ Data validation	-0.043	0.000	-0.043
= Sub-total	426.839	371.672	55.167
+ Own-account fixed capital formation...	0.613	0.000	0.613
+ Changes in inventories of finished products and work in progress	-0.001	0.000	-0.001
= National accounts figures	427.451	371.672	55.779
+ Adjustments for exhaustiveness (N types)	2.992	-0.671	3.663
= Balance sheet result	430.443	371.001	59.442
+ Conceptual changes	-293.403	-289.076	-4.327
= National accounts result	137.040	81.925	55.115
+ Macroeconomic balancing	0.000	-1.521	1.521
+ FISIM	0.000	0.715	-0.715
+ Research and development	0.037	-0.075	0.112
= National accounts result (S.11/S.14) ..	137.077	81.044	56.033
Financial corporations (S.12)			
+ National accounts result (S.12)	0.000	0.000	0.000
General government (S.13)			
+ National accounts result (S.13)	0.000	0.000	0.000
Non-profit institutions serving households (S.15)			
+ National accounts result (S.15)	0.000	0.000	0.000
Total economy (S.1)			
= Published figures	137.077	81.044	56.033

3.11 Water supply, sewerage, waste management and remediation activities (NACE Rev. 2: E)

3.173 On the production side, this section is basically published in line with the industry divisions (integrated) of NACE Rev. 2 and/or WZ 2008; gross value added calculations themselves are more detailed and are broken down into the four divisions Water supply (WZ 36), Sewerage (WZ 37), Waste collection, treatment and disposal activities, including material recovery (WZ 38) and Remediation activities and other disposal activities (WZ 39).

The same calculation methods are used for all four industry groups within the industry section E.

Viewed across all national accounts sectors, table 3–42 shows the results of the production approach for section E (WZ 36 and WZ 37 to WZ 39) in 2010.

Table 3–42: Summary of the 'Water supply, sewerage, waste management and remediation activities' publication area (NACE Rev. 2 E)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					Share in				
			in EUR (billions)	in EUR (billions)	GVA in industry	Total GVA	GDP	GNI	
1	E	Water supply, sanitation and similar	49.902	25.972	23.930	100	1.0	0.9	0.9
2	36	Water supply	8.440	3.291	5.149	21.5	0.2	0.2	0.2
3	37–39	Sewerage, waste management; material recovery	41.462	22.681	18.781	78.5	0.8	0.7	0.7

In terms of sectors, this section includes general government (S.13), as well as non-financial corporations (S.11) and households (S.14). See Chapter 3.21 for details about calculations for the general government sector (S.13) for output, intermediate consumption and gross value added. The published figures for all sectors (S.1) are formed by adding the respective sector national accounts data.

The following derivation of the individual national accounts indicators in the production approach for section E and its industry divisions relates to the integrated national accounts sectors of non-financial corporations and households (S.11/S.14).

Determining output

3.174 Turnover data are available from multiple official sources to determine output for all four industry groups in section E. These are VAT statistics (advance VAT returns and time-delayed assessments), the statistical business register and, as specialised statistics, the cost structure survey for enterprises involved in electricity and gas supply, water supply, sewerage, waste management and remediation activities.

- 3.175 By weighing up the quality criteria such as exhaustiveness, accuracy, time availability and ESA-compliant use, the aforementioned cost structure survey was selected as the main source of statistics to be used to calculate output for all four industry divisions in section E.
- 3.176 As well as ensuring more accurate demarcation of the individual industry divisions, the cost structure survey is also used because, in comparison to the two other sources, it is the only survey that lists not only turnover data, but also the costs by cost type for the individual industry sectors in section E.
- 3.177 During the cost structure survey (EVAS 43221), a maximum of 7 000 enterprises, mainly involved in water supply, sewerage, waste management and remediation activities, are surveyed. The cut-off limit for water supply and sewerage enterprises is an annual water delivery figure or waste water volume of 200 000 m³ or more, while the cut-off limit for waste management enterprises is usually turnover of EUR 1 million or more.
- 3.178 These results are published in subject-matter series 4, series 6.1. 'Employees, turnover, investments and cost structure of enterprises involved in electricity and gas supply, water supply, sewerage, waste management and remediation activities'.
- 3.179 Even though the turnover data in the cost structure survey are used as the main source for calculating output in all four industry divisions in section E, the results of all the other aforementioned sources are continuously observed, analysed and compared to the main source used, in order to check exhaustiveness.
- 3.180 Once the turnover data in the cost structure survey has been used to determine the main data source to be used to calculate output, the source data are subjected to **data validation** in the next work step. The excise duties included in the results of the cost structure survey will be deducted in order to render results in basic prices in the water supply, sewerage, waste management and remediation activities industry divisions as part of this validation. The cost structure survey asks explicitly about excise duties, and they can therefore be deducted for each economic activity directly from the cost structure survey results. In the transition from gross value added for all industries at basic prices to gross domestic product at market prices, these excise duties are added together with other taxes on products on a global basis once again, i.e. not broken down by economic activity.
- 3.181 Own-account fixed capital formation and changes in inventories of work in progress and finished products (output) are then added to the turnover data previously calculated from the cost structure survey. The calculation of both indicators is based on the corresponding results from the cost structure survey.
- 3.182 In order to **ensure exhaustiveness** in line with ESA 2010, the next work step involves further adjustments, some of which cover all four industry divisions in sector E (see Chapter 7 for details).

All the industry divisions are affected by an allowance for hidden economy activities, as well as an under-reporting adjustment for own-account fixed capital formation, attributable to the fact that enterprises in the water supply, sewerage, waste management and remediation activities industry division tend not to activate own-account fixed capital formation for tax reasons; instead, they record these as costs (intermediate consumption) for the same period. This is why a flat allowance of 25% is added to the own-account fixed capital formation data in the cost structure survey for each industry division in section E. A valuation adjustment is also applied to own-account fixed capital formation, with a mark-up as part of adjustments for exhaustiveness.

- 3.183 Furthermore, reconciliation of the cost structure survey results with those in the business register shows that these are also under-reported in terms of very small enterprises due to the cut-off limits in the cost structure survey. This is why turnover data in the cost structure survey is increased in each of the four industry divisions by 1.0%.
- 3.184 Once the aforementioned adjustments for exhaustiveness have been added to output calculations, this provides the output for the individual industry divisions of industry sector E in line with the national accounts concept. Further conceptual changes (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts, e.g. recording the net value of goods bought for resale. Own-account research and development is also to be taken into account for the non-financial corporations sector in terms of further ESA-compliant implementation (see Chapter 5.10.4 for more details about research and development calculations).

The following table 3—43 shows the individual work steps for determining output for the four industry divisions in section E for the integrated sectors of non-financial corporations and households (S.11/S.14) once again.

Table 3—43: Derivation of output by industry division

Section E: 'Water supply, sanitation and similar'

Year 2010 in EUR (billions)

List	WZ 36	WZ 37	WZ 38	WZ 39	Section E
Non-financial corporations and households (S.11/S.14)					
Source data.....	9.083	10.247	24.376	0.377	44.083
+ Data validation.....	-0.002	0.000	-0.005	0.000	-0.007
= Sub-total.....	9.081	10.247	24.371	0.377	44.076
+ Own-account fixed capital formation.....	0.097	0.165	0.009	0.000	0.271
+ Changes in inventories of finished products and work in progress.....	0.007	0.007	0.076	0.005	0.095
= National accounts figures	9.185	10.419	24.456	0.382	44.442
+ Adjustments for exhaustiveness (N types)	0.157	0.190	0.563	0.008	0.918
= Balance sheet result	9.342	10.609	25.019	0.390	45.360
+ Conceptual changes.....	-1.625	-0.016	-2.165	-0.001	-3.807
= National accounts result	7.717	10.593	22.854	0.389	41.553
+ Macroeconomic balancing	0.000	0.000	0.000	0.000	0.000
+ FISIM.....	0.000	0.000	0.000	0.000	0.000
+ Research and development.....	0.000	0.002	0.000	0.000	0.002
= Output (S.11/S.14)	7.717	10.595	22.854	0.389	41.555
Financial corporations (S.12)					
+ Output (S.12)	0.000	0.000	0.000	0.000	0.000
General government (S.13)					
+ Output (S.13)	0.723	4.122	3.502	0.000	8.347

List	WZ 36	WZ 37	WZ 38	WZ 39	Section E
	Non-profit institutions serving households (S.15)				
+ Output (S.15).....	0.000	0.000	0.000	0.000	0.000
	Total economy (S.1)				
= Published figures.....	8.440	14.717	26.356	0.389	49.902

Determining intermediate consumption

- 3.185 The calculation of **intermediate consumption** for all four industry divisions in section E for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output.
- 3.186 Intermediate consumption is determined using the results of the annual cost structure survey for the branches electricity and gas supply, water supply, sewerage, waste management and remediation activities. These statistics contain all expenditure (costs) reported by the enterprises, broken down into survey features relevant to the production approach, e.g. material consumption, use of goods (use of bought-in electricity, gas and water for further distribution and use of goods bought for resale), expenditure for bought-in services (e.g. repairs, maintenance, installation and assembly, costs for third-party operation and waste disposal, expenditure for the disposal of fuel residues by third parties), costs for non-industrial services (rentals and rent, other costs such as testing, consultancy and legal costs, postage charges, telephone charges) and agency worker costs.
- 3.187 Economic activity-specific intermediate consumption ratios are derived from the cost structure survey data for the water supply, sewerage, waste management and remediation activities industry division via the reported expenditure and turnover data.
- 3.188 The national accounts source data for intermediate consumption for each industry division are determined by multiplying the industry sector-specific intermediate consumption ratios by the output determined on the basis of cost structure statistics.
- 3.189 A flat allowance of 0.4% is included in the economic activity-specific intermediate consumption ratios as part of the **adjustments for exhaustiveness**. This adjustment is based on the assumption that enterprises record private withdrawals as intermediate consumption to reduce profits for tax reasons, thereby recording excessive intermediate consumption in the cost structure survey.
- 3.190 Intermediate consumption for further adjustments for exhaustiveness in line with ESA 2010 is basically determined using the respective industry-specific intermediate consumption ratio (calculated as a percentage ratio of intermediate consumption to output). Only half the corresponding intermediate consumption ratio is used for the allowance for hidden economy activities per industry division, given the lack of precise information.
- 3.191 Once the **conceptual changes** have been added to intermediate consumption, this provides the intermediate consumption for each industry division in line with national accounts concepts. In order to transpose the data to published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10.4).

Table 3–44 shows a summary of the individual intermediate consumption calculation phases for section E again for the integrated non-financial corporations and households sectors (S.11/S.14).

Table 3–44: Derivation of intermediate consumption by industry division

Section E: 'Water supply, sanitation and similar'

Year 2010 in EUR (billions)

List	WZ 36	WZ 37	WZ 38	WZ 39	Section E
	Non-financial corporations and households (S.11/S.14)				
Source data	4.492	3.548	16.442	0.222	24.704
+ Data validation	0.000	0.000	0.000	0.000	0.000
= Sub-total.....	4.492	3.548	16.442	0.222	24.704
+ Own-account fixed capital formation	0.000	0.000	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress	0.000	0.000	0.000	0.000	0.000
= National accounts figures	4.492	3.548	16.442	0.222	24.704
+ Adjustments for exhaustiveness (N types)	0.035	0.026	0.204	0.002	0.267
= Balance sheet result	4.527	3.574	16.646	0.224	24.971
+ Conceptual changes	-1.440	-0.012	-2.114	-0.003	-3.569
= National accounts result.....	3.087	3.562	14.532	0.221	21.402
+ Macroeconomic balancing.....	-0.128	-0.194	-0.230	-0.005	-0.557
+ FISIM	0.040	0.060	0.133	0.000	0.233
+ Research and development	-0.001	-0.003	0.000	0.000	-0.004
= Intermediate consumption (S.11/S.14).....	2.998	3.425	14.435	0.216	21.074
	Financial corporations (S.12)				
+ Intermediate consumption (S.12).....	0.000	0.000	0.000	0.000	0.000
	General government (S.13)				
+ Intermediate consumption (S.13).....	0.293	1.817	2.788	0.000	4.898
	Non-profit institutions serving households (S.15)				
+ Intermediate consumption (S.15).....	0.000	0.000	0.000	0.000	0.000
	Total economy (S.1)				
= Published figures	3.291	5.242	17.223	0.216	25.972

Deriving gross value added

3.192 **Gross value added** for the individual industry divisions of section E is calculated by subtracting intermediate consumption from output (subtraction method) for the integrated non-financial corporations and households sectors (S.11/S.14).

The following table shows the results for output, intermediate consumption and gross value added, summarised by individual calculation step for section E and all sectors once again.

Table 3–45: Derivation of national accounts results in the production approach
Section E: 'Water supply, sanitation and similar'
Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
Non-financial corporations and households (S.11/S.14)			
Source data	44.083	24.704	19.379
+ Data validation	-0.007	0.000	-0.007
= Sub-total.....	44.076	24.704	19.372
+ Own-account fixed capital formation	0.271	0.000	0.271
Changes in inventories of finished products and work in progress.....	0.095	0.000	0.095
= National accounts figures	44.442	24.704	19.738
+ Adjustments for exhaustiveness (N types)	0.918	0.267	0.651
= Balance sheet result	45.360	24.971	20.389
+ Conceptual changes	-3.807	-3.569	-0.238
= National accounts result	41.553	21.402	20.151
+ Macroeconomic balancing	0.000	-0.557	0.557
+ FISIM.....	0.000	0.233	-0.233
+ Research and development.....	0.002	-0.004	0.006
= National accounts result (S.11/S.14)	41.555	21.074	20.481
Financial corporations (S.12)			
+ National accounts result (S.12)	0.000	0.000	0.000
General government (S.13)			
+ National accounts result (S.13)	8.347	4.898	3.449
Non-profit institutions serving households (S.15)			
+ National accounts result (S.15)	0.000	0.000	0.000
Total economy (S.1)			
= Published figures	49.902	25.972	23.930

3.12 Construction (NACE Rev. 2: F)

- 3.193 On the production side, calculations for the section construction are basically carried out for the three industry divisions (WZ 41, WZ 42, WZ 43) of NACE Rev. 2 and/or WZ 2008, published in line with WZ special breakdown A*64 in ESA 2010 at sector level and delivered to Eurostat (Table 3–46):

Table 3–46: Summary of the 'Construction' publication area (NACE Rev. 2 F)

Year 2010									
Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					Share in				
			in EUR (billions)	in EUR (billions)	GVA in industry	Total GVA	GDP	GNI	
					in %				
1	F	Construction	231.376	131.533	99.843	100	4.3	3.9	3.8

In terms of sectors, all economic output yielded in this section is exclusively from the non-financial corporations (S.11) and households (S.14) sectors.

Determining output

- 3.194 Various **source data** are available for calculating output for all three industry divisions in sector F. Alongside annual data from VAT statistics (advance VAT returns (EVAS 73311) and time-delayed assessments (EVAS 73321)), the results of the statistical business register (EVAS 52111) and specialised statistics for the construction industry are available. The specialised statistics include the annual business and investment survey (EVAS 44211, 44221) for enterprises with 20 or more employees, the construction structure survey (EVAS 44252) for enterprises with 1 to 19 employees (not published at national level), the construction cost structure survey (EVAS 44253, 44254) for enterprises with 20 or more employees, the annual survey in the secondary construction industry and for developers (EVAS 44241) for all enterprises with 10 or more employees, the supplementary survey for primary construction (EVAS 44231) for all primary construction enterprises and other industry sectors, including primary construction associations, and the craft and trade results taken from the business register.
- 3.195 By weighing up the quality criteria such as exhaustiveness, accuracy, time availability and ESA-compliant use, the annual business and investment survey for enterprises with 20 or more employees was selected as the main source of statistics to be used for the construction of buildings (WZ 41) and civil engineering (WZ 42) sectors, as well as the structure survey for enterprises with 1 to 19 employees (WZ 41) and/or the supplementary survey for main construction (WZ 42) for the 1 to 19 employees size band. Output for the specialised construction activities (WZ 43) is calculated on the basis of VAT statistics (advance VAT returns).
- 3.196 In the construction of buildings and civil engineering industry divisions (WZ 41 and WZ 42), the advantage of the annual enterprise survey over the turnover data from VAT statistics and the business register – despite the enterprise size band threshold – is that it also includes annual construction output. Annual construction output incorporates the value of all construction work undertaken in Germany during the

financial year, irrespective of when the work was ordered or paid for. It also incorporates income from work performed by enterprises as subcontractors and work performed for them by external enterprises or subcontractors. In terms of the two industry sectors, the annual construction output results are closer to the definition of output than the turnover data from other sources.

Nevertheless, all further statistics for these industry sectors are still observed regularly and compared to the main data sources to be used.

- 3.197 The source data for determining the output of the individual industry divisions are discussed in detail below. Given the enterprise size band threshold in the annual business and investment survey, separate calculations are carried out for enterprises with 1 to 19 employees and those with 20 or more employees in the construction of buildings (WZ 41) and civil engineering (WZ 42) industry sectors.

Construction of buildings WZ 41:

- 3.198 Annual construction output data from the annual business and investment survey are used to determine the source data for enterprises with 20 or more employees. The so-called 'other turnover' of the enterprises is added to this data. This is turnover from other own products and from industrial/craft and trade services, from goods bought for resale and other non-industrial and non-craft/non-trade activities. This information can also be derived from the annual business and investment survey.

The source data determined in this way for enterprises with 20 or more employees is then supplemented by turnover data from the construction structure survey for WZ 41 for enterprises below this enterprise size band, i.e. building construction enterprises with 1 to 19 employees.

Civil engineering WZ 42:

- 3.199 As for the WZ construction of buildings sector, annual construction output data and other turnover from the annual business and investment survey are used to determine the source data for civil engineering for enterprises with 20 or more employees. This source data for enterprises with 20 or more employees is supplemented with corresponding turnover data from the supplementary survey for primary construction for enterprises with 1 to 19 employees. Although these statistics contain the concept of establishment in comparison to the structure survey, the supplementary survey – not the structure survey – is used for the civil engineering industry sector as the former is more exhaustive.

Specialised construction activities WZ 43:

- 3.200 In the industry division for specialised construction activities, source data are based on the annual results of VAT statistics (advance VAT returns). The reason for this is that, in comparison to the annual business and investment survey, the VAT statistics cover all specialised construction enterprises, i.e. there is no enterprise size band threshold, and the differences between annual construction output and turnover in this industry division are of lesser importance.
- 3.201 Once the source data has been calculated for all construction industry divisions, **data validation** is carried out in the next work step. In relation to sector F, the results of the annual survey are adjusted for the construction of buildings and civil engineering industry divisions (WZ 41 and WZ 42), deducting the turnover generated by housing services in order to prevent double counting. Housing services (WZ sector L) are marked out as 'functional' according to national accounts concepts and therefore already cover all economic output from such housing services.
- 3.202 **Own-account fixed capital formation and changes in inventories** of work in progress and finished products (output) are then added to the turnover data previously

calculated, in order to determine output in the national accounts. The corresponding results from the construction cost structure survey are used as the source data for both indicators. As the cost structure survey only covers all enterprises with 20 or more employees, the smallest size band in that survey (20 to 49 employees) is used to replace the size band of 1 to 19 employees.

- 3.203 In order to ensure **exhaustiveness in line with ESA 2010**, the next work step involves further adjustments, some of which cover all the industry divisions in sector F (see Chapter 7 for details).
- 3.204 As part of the adjustments to ensure exhaustiveness, an allowance is made in all three industry divisions of sector F for own-account fixed capital formation on the grounds of imputed under-reporting, as there is a tax-related incentive for enterprises to record low volumes of own-account fixed capital formation in order to avoid higher taxes on enterprise profit. This allowance was 25% on own-account fixed capital formation reported in the cost structure survey in 2010.
- 3.205 Output is also increased for WZ 41 and 42 as the result of reconciliation with VAT statistics. The allowance was 2.5% in 2010. The allowance amount is the result of regular pilot assessments regarding the comparability of concept-based and systematic economic activity disparities between the various data sources for the construction industry.
- 3.206 An allowance is also made in output calculations for all industry divisions in sector F for annual construction output carried out by foreign enterprises. Construction activities carried out in Germany by foreign construction companies for a period of over one year are added to the national accounts, as are construction activities carried out abroad by German companies for a period of less than one year. The balance of payments statistics compiled by Deutsche Bundesbank are used as the data source for these adjustments for exhaustiveness.
- 3.207 There are also adjustments for exhaustiveness in the construction of buildings (WZ 41) and specialised construction activities (WZ 43) industries for illegal employment and work performed by non-entrepreneurs (NU). Work performed by non-entrepreneurs can be both construction work that is undertaken for investment reasons and non-capital construction work. Construction work that is undertaken for investment reasons is treated based on the calculation of capital formation in buildings and structures (see Chapter 5.10.1). These are assumptions made for own-account building work of the households as investors of dwellings (including family and neighbourly assistance) as well as for hidden activities. Initially calculated as expenditure and then transposed to production, work performed by non-entrepreneurs that is undertaken for investment reasons is broken down proportionally by the weight of nominal output for WZ 41 and WZ 43.
- 3.208 Non-capital construction work results from data gained from reconciliation with the input-output account as well as estimates. Overall, 10% of work performed by non-entrepreneurs that is undertaken for investment reasons was included in 2010. The results determined in this way for total work performed by non-entrepreneurs are then adjusted by output from voluntary activities.
- 3.209 An adjustment is also made in the construction of buildings and civil engineering industry sectors (WZ 41 and WZ 42) for small enterprise (1 to 19 employees) turnover recorded in the supplementary survey for primary construction, in order to avoid double counting. As the supplementary survey is an establishment survey, these data must be adjusted for enterprise-based presentation. The first requirement is to eliminate units that are part of enterprises outside the construction industry, and then adjustments must be made for double counting within the category of primary construction. Such double counting of output and/or turnover data invariably occurs

when construction units with 1 to 19 employees are required to submit returns in the supplementary survey and the enterprises with 20 or more employees to which they belong are required to submit returns in the annual business and investment survey. On the basis of various special studies, it is currently estimated that 2.5% of the turnover from the supplementary survey (1 to 19 employees) needs to be deducted in 2010.

- 3.210 Once the aforementioned adjustments for exhaustiveness have been added to output calculations, this provides the output for the individual industry divisions of industry sector F in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts, e.g. recording the net value of goods bought for resale. **Own-account research and development** is also to be taken into account for the non-financial corporations sector in terms of further ESA-compliant implementation (see Chapter 5.10.4 for more details about research and development calculations).

Table 3–47 below shows the individual work steps for determining output for the three industry divisions in sector F for the integrated sectors of non-financial corporations and households (S.11/S.14) once again.

Table 3–47: Derivation of output by industry division

Section F: 'Construction'

Year 2010 in EUR (billions)

List	WZ 41	WZ 42	WZ 43	Section F
	Non-financial corporations and households (S.11/S.14)			
Source data	42.330	25.687	143.170	211.187
+ Data validation	-0.076	-0.010	0.000	-0.086
= Sub-total.....	42.254	25.677	143.170	211.102
+ Own-account fixed capital formation	0.094	0.018	0.000	0.112
+ Changes in inventories of finished products and work in progress	0.034	0.017	0.000	0.051
= National accounts figures	42.383	25.712	143.170	211.265
+ Adjustments for exhaustiveness (N types)	4.077	0.771	20.225	25.073
= Balance sheet result	46.460	26.483	163.395	236.338
+ Conceptual changes	-4.112	-0.065	-0.830	-5.007
= National accounts result.....	42.348	26.418	162.565	231.331
+ Macroeconomic balancing.....	0.000	0.000	0.000	0.000
+ FISIM.....	0.000	0.000	0.000	0.000
+ Research and development	0.045	0.000	0.000	0.045
= Output (S.11/S.14).....	42.393	26.418	162.565	231.376
	Financial corporations (S.12)			
+ Output (S.12).....	0.000	0.000	0.000	0.000

List	WZ 41	WZ 42	WZ 43	Section F
	General government (S.13)			
+ Output (S.13).....	0.000	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)			
+ Output (S.15).....	0.000	0.000	0.000	0.000
	Total economy (S.1)			
= Published figures	42.393	26.418	162.565	231.376

Determining intermediate consumption

- 3.211 The calculation of **intermediate consumption** for all three industry divisions in section F for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output.
- 3.212 Only the results of the construction cost structure survey for enterprises with 20 or more employees are available as **source data**. Economic activity-specific percentage intermediate consumption ratios are derived from these results, dividing the recorded costs by turnover. No original collected intermediate consumption data are published for enterprises below the enterprise size band used in the cost structure survey, i.e. for those with 1 to 19 employees. Instead, the intermediate consumption ratio for the smallest size band used in the cost structure survey (20 to 49 employees) is used for this size band. In addition, an allowance is made for the fact that intermediate consumption ratios tend to diminish from higher to lower size categories (multiplication by the adjustment factor 0.95) Both calculations separated by enterprise size band are then added together, which generates an integrated intermediate consumption ratio for all enterprises for each construction industry division.
- 3.213 In the same way as output validation, expenditure for housing services implicitly included in the annual and investment survey is deducted when calculating intermediate consumption as part of **data validation**. The intermediate consumption ratio for housing services (sector L) was used here instead for this adjustment. The national accounts figures for intermediate consumption are compiled by adding the source data and data validation, plus corresponding intermediate consumption for own-account fixed capital formation and changes in inventories of work in progress and finished products (input).
- 3.214 As part of further **adjustments for exhaustiveness** in line with ESA 2010, the intermediate consumption ratios are reduced in all construction industry divisions, by 0.4% in 2010, as it can be assumed that there is a tendency to overstate intermediate consumption, because some inexpensive capital goods or products removed from inventories for private use are likely to be included in the recorded expenditure. The intermediate consumption ratio for own-account production is derived from the construction cost structure survey. The aforementioned modified intermediate consumption ratio for the smallest size band surveyed is used for the 1 to 19 employees size band, i.e. the size below the reporting threshold for the cost structure survey. These ratios are also used to determine intermediate consumption for hidden economy activities.
- 3.215 Once the **conceptual changes** have been added to intermediate consumption, this provides the intermediate consumption for each industry division in line with national accounts concepts. In order to transpose the data to published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see

Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10.4).

Table 3–48 shows a summary of the individual intermediate consumption calculation phases for industry sector F once again for the integrated non-financial corporations and households sectors (S.11/S.14).

Table 3–48: Derivation of intermediate consumption by industry division

Section F: 'Construction'

Year 2010 in EUR (billions)

List	WZ 41	WZ 42	WZ 43	Section F
	Non-financial corporations and households (S.11/S.14)			
Source data	27.466	16.301	81.825	125.592
+ Data validation	-0.019	-0.003	0.000	-0.022
= Sub-total	27.447	16.298	81.825	125.570
+ Own-account fixed capital formation	0.000	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress	0.000	0.000	0.000	0.000
= National accounts figures	27.447	16.298	81.825	125.570
+ Adjustments for exhaustiveness (N types)	1.608	-0.061	10.752	12.299
= Balance sheet result	29.055	16.237	92.577	137.869
+ Conceptual changes	-4.346	-0.111	-1.636	-6.093
= National accounts result	24.709	16.126	90.941	131.776
+ Macroeconomic balancing	-0.487	-0.284	-1.976	-2.747
+ FISIM	0.333	0.202	1.985	2.520
+ Research and development	-0.016	0.000	0.000	-0.016
= Intermediate consumption (S.11/S.14)	24.539	16.044	90.950	131.533
	Financial corporations (S.12)			
+ Intermediate consumption (S.12)	0.000	0.000	0.000	0.000
	General government (S.13)			
+ Intermediate consumption (S.13)	0.000	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)			
+ Intermediate consumption (S.15)	0.000	0.000	0.000	0.000
	Total economy (S.1)			
= Published figures	24.539	16.044	90.950	131.533

Deriving gross value added

3.216 Gross value added for the individual industry divisions, and therefore the entire construction section, is calculated by subtracting intermediate consumption from output (subtraction method).

The following table provides an overview of national accounts results (WZ F) in the production approach. It shows the results for output, intermediate consumption and gross value added, summarised by individual calculation step for industry section F.

Table 3–49: Derivation of national accounts results in the production approach
Section F: 'Construction'
Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
Non-financial corporations and households (S.11/S.14)			
Source data.....	211.187	125.592	85.595
+ Data validation.....	-0.086	-0.022	-0.064
= Sub-total	211.102	125.570	85.531
+ Own-account fixed capital formation.....	0.112	0.000	0.112
+ Changes in inventories of finished products and work in progress	0.051	0.000	0.051
= National accounts figures.....	211.265	125.570	85.695
+ Adjustments for exhaustiveness (N types).....	25.073	12.299	12.774
= Balance sheet result.....	236.338	137.869	98.469
+ Conceptual changes.....	-5.007	-6.093	1.086
= National accounts result	231.331	131.776	99.555
+ Macroeconomic balancing	0.000	-2.747	2.747
+ FISIM	0.000	2.520	-2.520
+ Research and development.....	0.045	-0.016	0.061
= National accounts result (S.11/S.14)....	231.376	131.533	99.843
Financial corporations (S.12)			
+ National accounts result (S.12).....	0.000	0.000	0.000
General government (S.13)			
+ National accounts result (S.13).....	0.000	0.000	0.000
Non-profit institutions serving households (S.15)			
+ National accounts result (S.15).....	0.000	0.000	0.000
Total economy (S.1)			
= Published figures.....	231.376	131.533	99.843

3.13 Wholesale and retail trade; repair of motor vehicles (NACE Rev. 2: G)

3.217 On the production side, this sector is basically calculated and published in line with the three industry divisions (WZ 45, WZ 46, WZ 47) of NACE Rev. 2 and/or WZ 2008. For the purposes of the input-output account, calculations for the industry divisions are also broken down further into the WZ five-digit heading level. A comparable calculation method is used for all industry groups and divisions in the 'Wholesale and retail trade, repair of motor vehicles' industry sector.

Viewed across all national accounts sectors, Table 3–50 shows the results of the production approach for industry sector G and the corresponding industry divisions in 2010.

Table 3–50: Summary of the 'Wholesale and retail trade; repair of motor vehicles' publication area (NACE Rev. 2 G)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					in EUR (billions)	in EUR (billions)	Share in		
							GVA in industry	Total GVA	GDP
					in %				
1	F	Wholesale and retail trade; maintenance and repair of motor vehicles	413.803	184.427	229.376	100	9.9	8.9	8.7
2	45	Wholesale and retail trade, maintenance and repair of motor vehicles	60.177	20.199	39.978	14.4	1.7	1.5	1.5
3	46	Wholesale trade (except of motor vehicles)	201.561	94.199	107.362	46.8	4.6	4.2	4.1
4	47	Retail trade (except of motor vehicles) ...	152.065	70.029	82.036	35.8	3.5	3.2	3.1

In terms of sectors, all economic output yielded in this section is exclusively from the non-financial corporations (S.11) and households (S.14) sectors.

Determining output

3.218 Turnover data for enterprises are available from multiple official sources to determine output for all three industry divisions and their groups in the wholesale and retail trade section (WZ G). These are the statistical business register (URS) (EVAS 52111), the annual survey of the wholesale and retail trade (EVAS 45341) and VAT statistics, the

latter being based on advance VAT returns (EVAS 73311) and time-delayed after assessments (EVAS 73321).

- 3.219 By weighing up the quality criteria such as exhaustiveness, accuracy and time availability, the URS results were selected as the main source of statistics to be used to calculate output for all three industry divisions. The structure and constant further development of the URS in recent years has led to an improved data source for turnover being available for the national accounts, as well as the fact that the specialised statisticians carry out their surveys (selection population) on the basis of the register. The advantage of the business register in comparison to VAT statistics (advance VAT returns) is that the results are not biased by the tax groups¹⁷ that occur particularly frequently in this industry sector in terms of economic activity classification. Another advantage of the URS compared to VAT statistics is that the industry-specific classification of enterprises is often carried out using data from the surveyed units in surveys carried out in line with NACE Rev. 2. This means that the WZ classification of this unit changes correctly if the main focus of economic activity of a unit changes or in the event of business field spin-offs for the unit. This method ensures that results by economic activity reflect reality as closely as possible.
- 3.220 In terms of using the annual survey of the wholesale and retail trade to determine output in industry sector G, comparative analyses have shown that turnover data from the annual survey have been behind those in VAT statistics and the business register for years. The business register was therefore chosen as a suitable data source for calculating output in the wholesale and retail trade in the 2014 revision, as the business register provides better systematic industry classification than the VAT statistics and therefore probably delivers more exhaustive results than the annual survey. Although the business register results are only available three years after the reporting year, they are available in time for the final calculation of national accounts.
- 3.221 Even though the turnover data in the statistical business register are used as the main source for calculating output in all three industry divisions in the wholesale and retail trade, the results of all the other aforementioned sources are continuously observed, analysed and compared to the main source used, in order to check exhaustiveness.
- 3.222 Once the turnover data in the business register has been used to determine the main data source to be used to calculate output, the source data are basically subjected to **data validation** in the next work step. No data validation was required for the results of the URS for industry sector G in 2010.
- 3.223 Own-account fixed capital formation and changes in inventories of work in progress and finished products (output) are then added to the turnover data previously calculated from the URS. Calculations for own-account fixed capital formation are based on the corresponding derived ratios from earlier cost structure statistics, since the annual survey of the wholesale and retail trade only surveys gross capital formation as a whole, with no further breakdown into own-account fixed capital. There are no changes in inventories in this industry sector.
- 3.224 In order to ensure **exhaustiveness in line with ESA 2010**, the next work step involves further adjustments, some of which cover all the industry divisions in sector G (see Chapter 7 for details). The individual adjustments are as follows:

¹⁷ Under German fiscal law, a tax group is a group of legally independent units that come together to form a tax unit. One or more legally independent units (subsidiary companies) will be incorporated into another legally independent unit (controlling company) in financial, economic and organisational terms. The controlling company represents the entire unit in communications with the tax authorities as the uniform taxpayer.

Allowance for smaller enterprises below the URS threshold (all WZ divisions)

The business register covers all enterprises with a current annual turnover of EUR 17 500 or more and/or those who employ at least one person who is liable for payment of social security. A corresponding allowance is made in output calculations for each industry division for smaller enterprises below these thresholds, in order to ensure exhaustiveness. The turnover of small enterprises as listed in VAT statistics is used as the data basis for calculating this allowance for exhaustiveness, based on assessments that are normally available four years after the end of the reporting year. Economic activity-specific allowance factors are generated for each industry division and its groups in the wholesale and retail trade sector, using the percentage ratio of small enterprise turnover to all turnover in the assessment statistics, in order to estimate the corresponding turnover results from the business register.

Allowances for hidden economy (all WZ divisions)

Adjustments for exhaustiveness are carried out in all industry divisions for hidden economy activities, such as illegal employment, as part of determining output for the wholesale and retail trade. These allowances are based on a model calculation, described in more detail in Chapter 7.

Allowance based on reconciliation with production statistics (WZ 46)

Checks on the recording of goods production as a secondary activity were carried out as part of calculations for the input/output account for the years from 2010 in the wholesale and retail trade sectors (WZ 45, WZ 46, WZ 47). Data on goods production in the wholesale and retail trade statistics were sometimes behind those for production statistics. Output has therefore been based on production statistics data (EVAS 42121, 42131) since this observation period in WZ 46 (in concrete terms: 46.4 and 46.5). In 2010, this led to an increase of EUR 3.506 billion in turnover from the URS.

Valuation adjustment for own-account fixed capital formation (WZ 45 and WZ 46)

Production for own final use, such as own-account fixed capital formation or own consumption by business owners should essentially be valued at the basic prices of comparable goods on the market (ESA 2010, Paragraph 3.45). This means that a mark-up basically needs to be taken into account for this type of production.

In terms of data taken from previous cost structure surveys for the wholesale and retail trade regarding own-account fixed capital formation, largely resulting from the business accounts of the individual enterprises, it is assumed that these are recorded without a mark-up for tax reasons and are therefore too low for national accounts. A percentage mark-up is therefore added to the results for own-account fixed capital formation in the production approach. These allowances are based on a model calculation for the individual industry divisions (see Chapter 7).

Allowance for tips (WZ 45)

According to ESA 2010 concepts, tips received are to be recorded under both compensation of employees and output. Since it is assumed that this indicator is not included in the URS as source statistics, an adjustment for exhaustiveness is included as part of the determination of output for trade in motor vehicles and the repair of motor vehicles (WZ 45). The allowance amount is determined as part of the calculation of household final consumption expenditure. As well as being included in the production approach, these values are incorporated at the same amount into the expenditure approach (household final consumption expenditure) and as part of compensation of employees (income approach).

Allowance for drugs and smuggling (WZ 47)

Illegal activities were included in the calculation of gross domestic product as part of the 2014 major revision of national accounts. This applies to the manufacture and sale of drugs and smuggled goods in Germany. The sale of drugs and smuggled goods was taken into account on the production side in the 'Retail trade excluding trade in motor vehicles' industry division (WZ 47). The corresponding data for this sector are determined in a separate model calculation (see Chapter 7).

Adjustment of URS turnover results for the so-called scrapping bonus (WZ 45)

In the 'Trade in motor vehicles' industry division (WZ 45), turnover data from the URS from 2009 and 2010 were adjusted to take into account the so-called scrapping bonus for motor vehicles, because this is recorded on the production side in the national accounts as a subsidy as part of conceptual changes, i.e. upon transition from business accounting to national accounts concepts. This change is the result of the harmonised recording of scrapping bonuses specified as a requirement by the European Commission for all Member States. The scrapping bonus was promised during the economic and financial crisis as part of the stimulus packages set up in various ways at national level in individual European Union Member States to support the automotive industry, which was suffering financial difficulties.

Treatment of the German National Petroleum Stockpiling Agency and the Federal Office for Agriculture and Food

As part of the 2014 revision, the German National Petroleum Stockpiling Agency and the Federal Office for Agriculture and Food (from 1994; previously known as BALM – Bundesanstalt für marktwirtschaftliche Marktordnung/Federal Office for the Organization of Agricultural Markets) were assigned to WZ 84; they are therefore no longer part of wholesale trade.

- 3.225 Once the aforementioned adjustments for exhaustiveness have been added to output calculations, this provides the output for the individual industry divisions of industry sector G in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts, e.g. recording the net value of goods bought for resale. **Own-account research and development** is also to be taken into account for the non-financial corporations sector in terms of further ESA-compliant implementation (see Chapter 5.10.4 for more details about research and development calculations).

Table 3–51 below shows the individual work steps for determining output for the three industry divisions in sector H for the integrated sectors of non-financial corporations and households (S.11/S.14) once again.

Table 3–51: Derivation of output by industry division

Section G: 'Wholesale and retail trade, maintenance and repair of motor vehicles'

Year 2010 in EUR (billions)

List	WZ 45	WZ 46	WZ 47	Section G
	Non-financial corporations and households (S.11/S.14)			
Source data	184.851	1 019.803	472.199	1 676.853
+ Data validation	0.000	0.000	0.000	0.000
= Sub-total	184.851	1 019.803	472.199	1 676.853
+ Own-account fixed capital formation	0.019	0.147	0.000	0.166
+ Changes in inventories of finished products and work in progress	0.000	0.000	0.000	0.000
= National accounts figures	184.870	1 019.950	472.199	1 677.019
+ Adjustments for exhaustiveness (N types).....	1.985	3.905	2.844	8.734
= Balance sheet result.....	186.855	1 023.855	475.043	1 685.753
+ Conceptual changes	-126.678	-822.298	-322.978	-1 271.954
= National accounts result.....	60.177	201.557	152.065	413.799
+ Macroeconomic balancing.....	0.000	0.000	0.000	0.000
+ FISIM	0.000	0.000	0.000	0.000
+ Research and development	0.000	0.004	0.000	0.004
= Output (S.11/S.14)	60.177	201.561	152.065	413.803
	Financial corporations (S.12)			
+ Output (S.12)	0.000	0.000	0.000	0.000
	General government (S.13)			
+ Output (S.13)	0.000	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)			
+ Output (S.15)	0.000	0.000	0.000	0.000
	Total economy (S.1)			
= Published figures	60.177	201.561	152.065	413.803

Determining intermediate consumption

- 3.226 The calculation of **intermediate consumption** for all three industry divisions in section G for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output.
- 3.227 Only the annual survey of the wholesale and retail trade is available as source statistics for calculating intermediate consumption. These statistics contain all expenditure (costs) reported by the enterprises, broken down into survey features relevant to the production approach, e.g. the purchase of goods for resale (goods

purchase), consumables and supplies, costs for rentals and rent and purchased services (payments for agency workers) and other operating expenditure (e.g. tax advice costs). The use of goods bought for resale is particularly significant in terms of the total operating expenditure reported by enterprises in this industry sector.

- 3.228 Economic activity-specific intermediate consumption ratios are derived from the data in the annual survey of the wholesale and retail trade via the reported expenditure and turnover data.

The national accounts source data for intermediate consumption for each industry is determined by multiplying the industry sector-specific intermediate consumption ratios by the output determined on the basis of the business register.

- 3.229 The ratio of goods bought for resale in WZ 45.2 is modified as part of **data validation**. This adjustment is the result of quality checks in harmony with the input-output account between the annual survey of the wholesale and retail trade and the wholesale and retail trade sample survey. These checks indicated that the use of goods bought for resale in the same condition is apparently excessive in the annual survey for the 'Repair of motor vehicles' division (WZ 45.2), resulting in a negative trade margin in this industry sector. The figures for the use of goods bought for resale in the annual survey are therefore reduced, in order to prevent this and ensure that records for this sector are as exhaustive as possible. For example, the figure for goods bought for resale in the annual survey in 2010 was adjusted by EUR 6.972 billion.

- 3.230 Intermediate consumption for further **adjustments for exhaustiveness** in line with ESA 2010 is basically determined using the respective industry-specific intermediate consumption ratio (calculated as a percentage ratio of intermediate consumption to output).

Only half the corresponding intermediate consumption ratio is used for the allowance for illegal employment per industry division, given the lack of precise information.

Intermediate consumption for the inclusion of drugs and smuggling is calculated using a separate model calculation, based on the intermediate consumption ratio for WZ 47.9.

- 3.231 Once the **conceptual changes** have been added to intermediate consumption, this provides the intermediate consumption for each industry division in line with national accounts concepts. In order to transpose the data into published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10).

Table 3–52 shows a summary of the individual intermediate consumption calculation phases for industry sector G once again.

Table 3–52: Derivation of intermediate consumption by industry division
 Section G: 'Wholesale and retail trade, maintenance and repair of motor vehicles'
 Year 2010 in EUR (billions)

List	WZ 45	WZ 46	WZ 47	Section G
	Non-financial corporations and households (S.11/S.14)			
Source data.....	154.576	912.026	391.961	1 458.564
+ Data validation.....	-6.969	0.000	0.000	-6.969
= Sub-total.....	147.607	912.026	391.961	1 451.594
+ Own-account fixed capital formation.....	0.000	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress.....	0.000	0.000	0.000	0.000
= National accounts figures.....	147.607	912.026	391.961	1 451.594
+ Adjustments for exhaustiveness N types).....	0.411	0.549	1.198	2.158
= Balance sheet result.....	148.018	912.575	393.159	1 453.752
+ Conceptual changes.....	-127.185	-816.371	-322.274	-1 265.830
= National accounts result.....	20.833	96.204	70.885	187.922
+ Macroeconomic balancing.....	-1.086	-2.907	-2.240	-6.233
+ FISIM.....	0.452	1.159	1.384	2.995
+ Research and development.....	0.000	-0.257	0.000	-0.257
= Intermediate consumption (S.11/S.14).....	20.199	94.199	70.029	184.427
	Financial corporations (S.12)			
+ Intermediate consumption (S.12).....	0.000	0.000	0.000	0.000
	General government (S.13)			
+ Intermediate consumption (S.13).....	0.000	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)			
+ Intermediate consumption (S.15).....	0.000	0.000	0.000	0.000
	Total economy (S.1)			
= Published figures.....	20.199	94.199	70.029	184.427

Deriving gross value added

3.232 Gross value added for industry section G is calculated by subtracting intermediate consumption from output (subtraction method), as is common practice with market production.

The following table provides an overview of national accounts results for the wholesale and retail trade section (WZ G) in the production approach.

Table 3–53: Derivation of national accounts results in the production approach
 Section G: 'Wholesale and retail trade, maintenance and repair of motor vehicles'
 Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
	Non-financial corporations and households (S.11/S.14)		
Source data	1 676.853	1 458.564	218.290
+ Data validation	0.000	-6.969	6.969
= Sub-total	1 676.853	1 451.594	225.259
+ Own-account fixed capital formation	0.166	0.000	0.166
+ Changes in inventories of finished products and work in progress	0.000	0.000	0.000
= National accounts figures	1 677.019	1 451.594	225.425
+ Adjustments for exhaustiveness (N types)	8.734	2.158	6.576
= Balance sheet result	1 685.753	1 453.752	232.001
+ Conceptual changes	-1 271.954	-1 265.830	-6.124
= National accounts result	413.799	187.922	225.877
+ Macroeconomic balancing	0.000	-6.233	6.233
+ FISIM	0.000	2.995	-2.995
+ Research and development	0.004	-0.257	0.261
= National accounts result (S.11/S.14)	413.803	184.427	229.376
	Financial corporations (S.12)		
+ National accounts result (S.12)	0.000	0.000	0.000
	General government (S.13)		
+ National accounts result (S.13)	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)		
+ National accounts result (S.15)	0.000	0.000	0.000
	Total economy (S.1)		
= Published figures	413.803	184.427	229.376

3.14 Transportation and storage (NACE Rev. 2: H)

3.233 On the production side, the transportation and storage industry sector is basically calculated and published in line with the five industry divisions (WZ 49, WZ 50, WZ 51, WZ 52, WZ 53) of NACE Rev. 2 and/or WZ 2008. Calculations for some industry divisions are broken down further into industry groups for the purposes of the input-output accounts and environmental economic account. A comparable calculation method is used for all industry groups and divisions in the 'Transportation and storage' section.

Viewed across all national accounts sectors, Table 3–54 shows the results of the production approach for section H and the corresponding industry divisions in 2010.

Table 3–54: Summary of the 'Transportation and storage' publication area (NACE Rev. 2 H)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added					
					in EUR (billions)	in EUR (billions)	Share in			
							GVA in industry	Total GVA	GDP	GNI
					in %					
1	H	Transportation and storage	266.034	158.184	107.850	100	4.6	4.2	4.1	
2	49	Land transport and transport via pipelines ..	87.532	45.840	41.692	38.7	1.8	1.6	1.6	
3	50	Water transport	23.590	15.810	7.780	7.2	0.3	0.3	0.3	
4	51	Air transport	23.417	17.009	6.408	5.9	0.3	0.2	0.2	

In terms of sectors, this section includes general government (S.13), as well as non-financial corporations (S.11) and households (S.14). See Chapter 3.21 for details about calculations for the general government sector (S.13) for output, intermediate consumption and gross value added. The published figures for all sectors (S.1) are formed by adding the respective sector national accounts data.

The following derivation of the individual national accounts indicators in the production approach for sector H and its industry divisions relates to the integrated national accounts sectors of non-financial corporations and households (S.11/S.14).

Determining output

3.234 Turnover data from multiple official and non-official sources, sometimes concurrent, are available as the **source data basis** for determining **output** for all five industry divisions and the industry groups in sector H. The annual official sources include VAT statistics (based on advance VAT returns and, with a lengthy time interval, those based on assessments), the statistical business register, annual transport statistics for selected transport sectors and the service structure survey. Profit and loss accounts taken from annual reports are also available as non-official sources for economically

significant transport enterprises such as Deutsche Bahn AG for rail transport and the Lufthansa Group for air transport.

- 3.235 By weighing up the quality criteria such as exhaustiveness, accuracy and time availability, the structural survey in the service sector (EVAS 47415) was selected as the main source of statistics to be used to calculate output for the five industry divisions of sector H. The service structure survey is a sample survey with a duty of disclosure. In comparison to the other sources, the advantage of these statistics is that the results are not biased by tax groups in terms of economic activity classification, as can be the case with VAT statistics. Industry-specific classification of the surveyed units in line with NACE Rev. 2 is carried out in the services structure survey in accordance with the economic focus of the enterprise, measured on the basis of gross value added. This means that the WZ classification of this unit changes correctly if the main focus of economic activity of a unit changes or in the event of business field spin-offs for the unit. This method ensures that results by economic activity reflect reality as closely as possible. A further advantage of the service structure survey is that it covers almost all the indicators relevant for production approach.
- 3.236 In terms of exhaustiveness, the turnover data from the service structure survey also covers non-taxable turnover by definition, and this turnover is potentially extremely significant in the transport sectors in particular (e.g. customs warehouse in a free port). The service structure survey differs from the VAT statistics, statistical business register and transport statistics in this respect. Although, in comparison to the service structure survey, the VAT statistics based on assessments (EVAS 73321) also include small enterprises, i.e. those with annual turnover below the (current) turnover threshold of EUR 17 500 per annum, the results of these statistics and currently also those of the statistical business register (EVAS 52111) are only made available with a time lag of almost four years/three years after the end of the reporting period. Data from these two sources would therefore not be available for the original production calculations carried out every summer for the reporting year $t - 2$ years. By contrast, the service structure survey meets the quality criterion of time availability, as the results of this survey are basically available around 18 months after the end of the reporting period. The results for small enterprises from annual VAT assessment statistics can nevertheless still be used in output calculations to ensure exhaustiveness, in a later work phase described below.
- 3.237 The results of transport statistics for selected transport sectors and the annual reports of economically significant transport enterprises would also be available on time for the original production calculations. However, in comparison to the service structure survey, the disadvantage of this information is that it does not cover the entire industry division, but only subsectors of a division or industry group. Furthermore, in conceptual terms, the annual transport statistics have been broken down by transport method rather than industry since they were amended in 2005.
- 3.238 Even though the turnover data in the service sector in the cost structure survey are used as the main source for calculating output in all five industry divisions, the results of all the other aforementioned sources are continuously observed, analysed and compared to the main source used, in order to check exhaustiveness.
- 3.239 Once the main data source to be used has been defined using the service structure survey, the source data are then supplemented, in the next work step as part of **data validation**, with turnover results for units that lie outside the scope of the service structure survey either in terms of industry or definition. This type of data validation is usually carried out at micro level and in close cooperation with specialised service statisticians. In terms of transport industry divisions, these are Deutsche Flugsicherung GmbH in WZ sector 52 and the international offices of Lufthansa (WZ 51). These units are not recorded in the service structure survey. The annual reports form the data basis

for supplementing information about these missing units as part of data validation for Deutsche Flugsicherung GmbH. Lufthansa itself makes internal information available for recording data about the Lufthansa international offices. For State-controlled or State-owned units (e.g. Deutsche Flugsicherung GmbH, which is 100% owned by the Federal Government), validation is only carried out after consultation with the relevant national accounts experts for the State budget.

- 3.240 Own-account fixed capital formation and changes in inventories of work in progress and finished products (output) are then added to the turnover data calculated previously, in order to determine output in the national accounts. The relevant national accounts experts provide data broken down accordingly into industry for the latter indicator to calculate changes in inventories. Own-account fixed capital formation is calculated on the basis of the service structure survey results for enterprises with an annual turnover of up to EUR 250 000. No data is directly available from these statistics for enterprises below this annual turnover threshold. To close these data gaps, the ratio of own-account fixed capital formation to gross fixed capital formation is determined for enterprises above the threshold, and this ratio is applied to smaller enterprises below the annual turnover threshold. This estimate is based on the assumption that the ratio of own-account fixed capital formation to total gross capital formation is similar for large and small enterprises.
- 3.241 In order to ensure **exhaustiveness in line with ESA 2010**, the next work step involves further adjustments, some of which cover all the industry divisions in sector H (see Chapter 7 for details). For example, this applies to allowances for under-reporting of the turnover of transport sector enterprises below the annual turnover threshold (EUR 17 500) in the service structure survey. The turnover of small enterprises as listed in VAT statistics is used as the data basis for calculating this allowance for exhaustiveness, based on assessments that are normally available four years after the end of the reporting year. Economic activity-specific allowance factors are generated for each transport and storage industry division, using the percentage ratio of small enterprise turnover to all turnovers in the assessment statistics, in order to estimate the corresponding turnover results from the service structure survey.
- 3.242 Allowances are also made in the divisions of sector H for turnover relating to illegal employment, tips and benefits in kind, as well as the adjustment of own-account fixed capital formation for mark-ups. There are also specific adjustments that only apply to one industry division in sector H. In the storage industry division (WZ 52), turnover data from the service structure survey is adjusted for the sales incorporated into the survey that are carried out by general government units in sector S.13. This is carried out in order to avoid double entry in both sectors. For air transport economic activity (WZ 51), data reconciliation with the air transport statistics indicates that turnover in the service structure survey is under-reported. A corresponding allowance for exhaustiveness is therefore made for this industry division.
- 3.243 Once the aforementioned adjustments for exhaustiveness have been added to output calculations, this provides the output for the individual industry divisions of industry sector H in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts, e.g. including subsidies on products in the industry sector for land transport for subsidised school transport. **Own-account research and development** is also to be taken into account for the non-financial corporations sector in terms of further ESA-compliant implementation (see Chapter 5.10.4 for more details about research and development calculations).

The following table shows the individual work steps for determining output for the five industry divisions in sector H for the integrated sectors of non-financial corporations and households (S.11/S.14) once again.

Table 3–55: Derivation of output by industry division

Section H: 'Transportation and storage'

Year 2010 in EUR (billions)

List	WZ 49	WZ 50	WZ 51	WZ 52	WZ 53	Section H
	Non-financial corporations and households (S.11/S.14)					
Source data	75.380	28.389	21.767	98.726	27.473	251.735
+ Data validation	0.000	0.000	0.109	1.012	0.000	1.121
= Sub-total.....	75.380	28.389	21.876	99.738	27.473	252.856
+ Own-account fixed capital formation..	1.562	0.000	0.000	0.143	0.000	1.706
+ Changes in inventories of finished products and work in progress	0.056	0.017	0.003	-0.208	0.000	-0.132
= National accounts figures	76.998	28.406	21.879	99.674	27.473	254.430
+ Adjustments for exhaustiveness (N types)	4.055	0.112	1.540	2.282	0.499	8.488
= Balance sheet result	81.053	28.518	23.419	101.956	27.972	262.918
+ Conceptual changes	6.452	-4.928	-0.002	-1.498	-0.418	-0.394
= National accounts result	87.505	23.590	23.417	100.458	27.554	262.524
+ Macroeconomic balancing	0.000	0.000	0.000	0.000	0.000	0.000
+ FISIM	0.000	0.000	0.000	0.000	0.000	0.000
+ Research and development.....	0.027	0.000	0.000	0.005	0.001	0.033
= Output (S.11/S.14)	87.532	23.590	23.417	100.463	27.555	252.557
	Financial corporations (S.12)					
+ Output (S.12)	0.000	0.000	0.000	0.000	0.000	0.000
	General government (S.13)					
+ Output (S.13)	0.000	0.000	0.000	3.477	0.000	3.477
	Non-profit institutions serving households (S.15)					
+ Output (S.15)	0.000	0.000	0.000	0.000	0.000	0.000
	Total economy (S.1)					
= Published figures	87.532	23.590	23.417	103.940	27.555	266.034

Determining intermediate consumption

- 3.244 The calculation of **intermediate consumption** for all five industry divisions in sector H for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output.
- 3.245 Alongside the results of the service structure survey, the profit and loss accounts in the annual reports of economically significant enterprises are also used each year as source data.
- 3.246 With the exception of the air transport division (WZ 51), the service structure survey is used as the main source for all other transport and storage industry divisions to

determine intermediate consumption, as for output, on the basis of its exhaustive industry coverage. The intermediate consumption ratio in the results of the Lufthansa profit and loss accounts is used to calculate intermediate consumption for the air transport sector, as this is the largest German air transport enterprise. In cooperation with the specialised service statisticians, special consideration is given to the fact that intermediate consumption data in the service structure survey could be biased, given Lufthansa's international connections.

- 3.247 The same data sources used to determine output are used to calculate intermediate consumption for the units added for Deutsche Flugsicherung GmbH and Lufthansa international offices, as part of **data validation**. The national accounts figures for intermediate consumption are compiled by adding the source data and data validation, plus corresponding intermediate consumption for own-account fixed capital formation and changes in inventories of work in progress and finished products (input).
- 3.248 Intermediate consumption for further **adjustments for exhaustiveness** in line with ESA 2010 is basically determined using the respective industry-specific intermediate consumption ratio (calculated as a percentage ratio of intermediate consumption to output). Only half the corresponding intermediate consumption ratio is used for the allowance for illegal employment per industry division, given the lack of precise information.
- 3.249 Once the **conceptual changes** have been added to intermediate consumption, this provides the intermediate consumption for each industry division in line with national accounts concepts. In order to transpose the data into published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10).

Table 3–56 shows a summary of the individual intermediate consumption calculation phases for industry sector H once again for the integrated non-financial corporations and households sectors (S.11/S.14).

Table 3–56: Derivation of intermediate consumption by industry division

Section H: 'Transportation and storage'

Year 2010 in EUR (billions)

List	WZ 49	WZ 50	WZ 51	WZ 52	WZ 53	Section H
Non-financial corporations and households (S.11/S.14)						
Source data.....	44.729	20.853	15.931	64.862	15.269	161.643
+ Data validation.....	0.000	0.000	0.092	0.169	0.000	0.261
= Sub-total.....	44.729	20.853	16.023	65.031	15.269	161.904
+ Own-account fixed capital formation	1.051	0.000	0.000	0.065	0.000	1.116
+ Changes in inventories of finished products and work in progress	0.032	0.012	0.002	-0.136	0.000	-0.089
= National accounts figures.....	45.811	20.866	16.025	64.960	15.269	162.931
+ Adjustments for exhaustiveness (N types)	1.074	0.041	1.052	0.685	0.139	2.993
= Balance sheet result.....	46.886	20.907	17.077	65.645	15.408	165.923
+ Conceptual changes.....	-0.625	-5.013	-0.015	-1.808	-0.425	-7.886
= National accounts result.....	46.261	15.894	17.062	63.837	14.983	158.037
+ Macroeconomic balancing	-1.138	-0.212	-0.175	-1.010	-0.347	-2.882
+ FISIM.....	0.727	0.128	0.122	0.603	0.166	1.746
+ Research and development.....	-0.010	0.000	0.000	-0.014	-0.001	-0.025
= Intermediate consumption (S.11/S.14).....	45.840	15.810	17.009	63.416	14.801	156.876
Financial corporations (S.12)						
+ Intermediate consumption (S.12).....	0.000	0.000	0.000	0.000	0.000	0.000
General government (S.13)						
+ Intermediate consumption (S.13).....	0.000	0.000	0.000	1.308	0.000	1.308
Non-profit institutions serving households (S.15)						
+ Intermediate consumption (S.15).....	0.000	0.000	0.000	0.000	0.000	0.000
Total economy (S.1)						
= Published figures.....	45.840	15.810	17.09	64.724	14.801	158.184

Deriving gross value added

3.250 **Gross value added** for the individual industry divisions of sector H is calculated by subtracting intermediate consumption from output (subtraction method) for the integrated non-financial corporations and households sectors (S.11/S.14).

The following table shows the results for output, intermediate consumption and gross value added, summarised by individual calculation step for industry sector H and all sectors once again.

Table 3–57: Derivation of national accounts results in the production approach

Section H: 'Transportation and storage'

2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
	Non-financial corporations and households (S.11/S.14)		
Source data.....	251.735	161.643	90.092
+ Data validation.....	1.121	0.261	0.860
= Sub-total.....	252.856	161.904	90.952
+ Own-account fixed capital formation.....	1.706	1.116	0.590
+ Changes in inventories of finished products and work in progress.....	-0.132	-0.089	-0.043
= National accounts figures.....	254.430	162.931	91.499
+ Adjustments for exhaustiveness (N types).....	8.488	2.993	5.496
= Balance sheet result.....	262.918	165.923	96.955
+ Conceptual changes.....	-0.394	-7.886	7.492
= National accounts result.....	262.524	158.037	104.487
+ Macroeconomic balancing.....	0.000	-2.882	2.882
+ FISIM.....	0.000	1.746	-1.746
+ Research and development.....	0.033	-0.025	0.058
= National accounts result (S.11/S.14).....	262.557	156.876	105.681
	Financial corporations (S.12)		
+ National accounts result (S.12).....	0.000	0.000	0.000
	General government (S.13)		
+ National accounts result (S.13).....	3.477	1.308	2.169
	Non-profit institutions serving households (S.15)		
+ National accounts result (S.15).....	0.000	0.000	0.000
	Total economy (S.1)		
= Published figures.....	266.034	158.184	107.850

3.15 Accommodation and food service activities (NACE Rev. 2: I)

3.251 On the production side, calculations for this section are basically carried out for the two industry divisions (WZ 55, WZ 56) of NACE Rev. 2 and/or WZ 2008, published in line with WZ special breakdown A*64 in ESA 2010 at sector level and delivered to Eurostat.

For the purposes of the input-output account, calculations for the industry divisions are also broken down further into the WZ 3-digit heading level. The same calculation method is used for all industry groups and divisions in the 'Accommodation and food service activities' section.

Viewed across all national accounts sectors, Table 3-58 shows the results of the production approach for the entire industry sector I in 2010.

Table 3–58: Summary of the 'Accommodation and food service activities' publication area (NACE Rev. 2 I)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					Share in				
			in EUR (billions)	in EUR (billions)	GVA in industry	Total GVA	GDP	GNI	
1	I	Accommodation and food service activities...	71.473	38.202	33.271	100	1.4	1.3	1.3

In terms of sectors, all economic output yielded in this section is exclusively from the non-financial corporations (S.11) and households (S.14) sectors.

Determining output

3.252 Turnover data for enterprises are available from multiple official sources to determine output for the two industry divisions and their groups in the accommodation and food service section. These are the statistical business register (URS) (EVAS 52111), the annual survey of the hotels and restaurants sector (EVAS 45342) and VAT statistics, the latter being based on advance VAT returns (EVAS 73311) and time-delayed on assessments (EVAS 73321).

3.253 By weighing up the quality criteria such as exhaustiveness, accuracy and time availability, the URS results were selected as the main source of statistics to be used to calculate output for both industry divisions. The structure and constant further development of the URS in recent years has led to an improved data source for turnover being available for the national accounts, as well as the fact that the specialised statisticians carry out their surveys (selection population) on the basis of the register. The advantage of the business register in comparison to VAT statistics (advance VAT returns) is that the results are not biased by tax groups in terms of economic activity classification. Another advantage of the URS compared to VAT statistics is that the industry-specific classification of enterprises is often carried out using data from the surveyed units in surveys carried out in line with NACE Rev. 2. This means that the economic activity classification of this unit changes correctly if the

main focus of economic activity of a unit changes or in the event of business field spin-offs for the unit. This method ensures that results by economic activity reflect reality as closely as possible.

- 3.254 In terms of the use of the annual survey of hotels and restaurants to determine output in industry sector I, comparative analyses have shown that turnover data from the annual survey have been behind those in VAT statistics and the business register for years. The business register was therefore chosen as a suitable data source for calculating the output approach in the accommodation and food services activities section in the 2014 revision, as the business register provides better systematic industry classification than the VAT statistics and therefore probably delivers more exhaustive results than the annual survey. Although the business register results are only available three years after the reporting year, they are available in time for the final calculation of national accounts.
- 3.255 Even though the turnover data in the statistical business register are used as the main source for calculating output in both industry divisions in the hotels and restaurants sector, the results of all the other aforementioned sources are continuously observed, analysed and compared to the main source used, in order to check exhaustiveness.
- 3.256 Once the turnover data in the business register has been used to determine the main data source to be used to calculate output, the source data are basically subjected to **data validation** in the next work step. No data validation was required for the results of the URS for industry sector I in 2010.
- 3.257 Own-account fixed capital formation and changes in inventories of work in progress and finished products (output) are then added to the turnover data previously calculated from the URS. Calculations for own-account fixed capital formation are based on the corresponding derived ratios from earlier cost structure statistics, since the annual survey of hotels and restaurants only surveys gross capital formation as a whole, with no further breakdown into own-account fixed capital. There are no changes in inventories in this industry sector.
- 3.258 In order to ensure **exhaustiveness in line with ESA 2010**, the next work step involves further adjustments, some of which cover all the industry divisions in sector I (see Chapter 7 for details). The individual adjustments are as follows:

Allowance for smaller enterprises below the URS threshold (all divisions)

- 3.259 The business register covers all enterprises with a current annual turnover of EUR 17 500 or more and/or those who employ at least one person who is liable for payment of social insurance. A corresponding allowance is made in output calculations for each industry division for smaller enterprises below these thresholds, in order to ensure exhaustiveness. The turnover of small enterprises as listed in VAT statistics is used as the data basis for calculating this allowance for exhaustiveness, based on assessments that are normally available four years after the end of the reporting year. Economic activity-specific allowance factors are generated for each industry division and its groups in the accommodation and food services section, using the percentage ratio of small enterprise turnover to all turnovers in the assessment statistics, in order to estimate the corresponding turnover results from the business register.

Allowances for hidden economy (all WZ divisions)

- 3.260 As part of determining output for the accommodation and food services section, adjustments for exhaustiveness are carried out in both industry divisions for hidden economy activities such as illegal employment. These allowances are based on a model calculation, described in more detail in Chapter 7.

Valuation adjustment for own-account fixed capital formation (all divisions)

- 3.261 Production for own final use, such as own-account fixed capital formation or own consumption by business owners should essentially be valued at the basic prices of comparable goods on the market (ESA 2010, Paragraph 3.45). This means that a mark-up basically needs to be taken into account for this type of production.

In terms of data taken from previous cost structure surveys for the hotels and restaurants sector regarding own-account fixed capital formation, largely resulting from the business accounts of the individual enterprises, it is assumed that these are recorded without a mark-up for tax reasons and are therefore too low for national accounts. A percentage mark-up is therefore added to the results for own-account fixed capital formation in the production approach. These allowances are based on a model calculation for the individual industry divisions (see Chapter 7).

Allowance for tips (all divisions)

- 3.262 According to ESA 2010 concepts, tips received are to be recorded under both compensation of employees and output. As there is an assumption when using the URS as source statistics that this indicator is not included in turnover data, an adjustment for exhaustiveness is carried out when determining output for the accommodation and food services section. The allowance amount is determined as part of the calculation of household final consumption expenditure. As well as being included in the production approach, these values are incorporated at the same amount into the expenditure approach (household final consumption expenditure) and as part of compensation of employees (income approach).

Allowance for stays in private accommodation with fewer than nine beds (division 55)

- 3.263 In the 'Accommodation' industry division (WZ 55), there is also an economic activity-specific allowance for stays in private accommodation with fewer than nine beds. This allowance for smaller units is determined as part of the calculation of household final consumption expenditure (expenditure approach) (see Chapter 7.2 and 5.7 for details).
- 3.264 Once the aforementioned adjustments for exhaustiveness have been added to output calculations, this provides the output for the individual industry divisions of section I in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts, e.g. recording the net value of goods bought for resale. **Own-account research and development** is also to be taken into account for the non-financial corporations sector in terms of further ESA-compliant implementation (see Chapter 5.10.4 for more details about research and development calculations).

The table 3–59 shows the individual work steps for determining output for the two industry divisions in section I for the integrated sectors of non-financial corporations and households (S.11/S.14) once again.

Determining intermediate consumption

- 3.265 The calculation of **intermediate consumption** for both industry divisions in sector I for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output.
- 3.266 Only the annual survey of the accommodation and food services section is available as source statistics for calculating intermediate consumption. These statistics contain all expenditure (costs) reported by the enterprises, broken down into survey features relevant to the production approach, e.g. the purchase of goods for resale (goods purchase), consumables and supplies, costs for rentals and rent and purchased

services (payments for agency workers) and other operating expenditure (e.g. tax advice costs).

- 3.267 Economic activity-specific intermediate consumption ratios are derived from the data in the annual survey of the hotels and restaurants sector via the reported expenditure and turnover data.
- 3.268 The national accounts source data for intermediate consumption for each industry is determined by multiplying the industry sector-specific intermediate consumption ratios by the output determined on the basis of the business register.

Table 3–59: Derivation of output by industry division

Section I: 'Accommodation and food service activities'

Year 2010 in EUR (billions)

List	WZ 55	WZ 56	Section I
	Non-financial corporations and households (S.11/S.14)		
Source data	23.593	43.199	66.792
+ Data validation	0.000	0.000	0.000
= Sub-total.....	23.593	43.199	66.792
+ Own-account fixed capital formation	0.006	0.011	0.017
+ Changes in inventories of finished products and work in progress.....	0.000	0.000	0.000
= National accounts figures	23.599	43.209	66.808
+ Adjustments for exhaustiveness (N types)	2.752	3.455	6.206
= Balance sheet result	26.351	46.664	73.015
+ Conceptual changes	-0.417	-1.125	-1.542
= National accounts result	25.934	45.539	71.473
+ Macroeconomic balancing	0.000	0.000	0.000
+ FISIM.....	0.000	0.000	0.000
+ Research and development.....	0.000	0.000	0.000
= Output (S.11/S.14).....	25.934	45.539	71.473
	Financial corporations (S.12)		
+ Output (S.12).....	0.000	0.000	0.000
	General government (S.13)		
+ Output (S.13).....	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)		
+ Output (S.15).....	0.000	0.000	0.000
	Total economy (S.1)		
= Published figures	25.934	45.539	71.473

3.269 Once the source data for intermediate consumption has been calculated, the source data are basically subjected to **data validation** in the next work step. No data validations were required for industry sector I in 2010, based on the intermediate consumption derived from the annual survey of the hotels and restaurants sector using intermediate consumption ratios.

3.270 Intermediate consumption for further **adjustments for exhaustiveness** in line with ESA 2010 is basically determined using the respective industry-specific intermediate consumption ratio (calculated as a percentage ratio of intermediate consumption to output).

Only half the corresponding intermediate consumption ratio is used for the allowance for illegal employment per industry division, given the lack of precise information.

3.271 Once the **conceptual changes** have been added to intermediate consumption, this provides the intermediate consumption for each industry division in line with national accounts concepts. In order to transpose the data into published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10).

Table 3–60 shows a summary of the individual intermediate consumption calculation phases for section I once again.

Table 3–60: Derivation of intermediate consumption by industry division

Section I: 'Accommodation and food service activities'

Year 2010 in EUR (billions)

List	WZ 55	WZ 56	Section I
	Non-financial corporations and households (S.11/S.14)		
Source data	12.801	24.828	37.629
+ Data validation	0.000	0.000	0.00
= Sub-total	12.801	24.828	37.629
+ Own-account fixed capital formation	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress	0.000	0.000	0.000
= National accounts figures	12.802	24.826	37.628
+ Adjustments for exhaustiveness (N types)	1.099	0.521	1.620
= Balance sheet result	13.900	25.347	39.247
+ Conceptual changes	-0.182	-0.819	-1.001
= National accounts result	13.718	24.528	38.246
+ Macroeconomic balancing	-0.337	-0.580	-0.917
+ FISIM	0.285	0.588	0.873
+ Research and development	0.000	0.000	0.000
= Intermediate consumption (S.11/S.14)	13.666	24.536	38.202
	Financial corporations (S.12)		
+ Intermediate consumption (S.12)	0.000	0.000	0.000
	General government (S.13)		
+ Intermediate consumption (S.13)	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)		
+ Intermediate consumption (S.15)	0.000	0.000	0.000
	Total economy (S.1)		
= Published figures	13.666	24.536	38.202

Deriving gross value added

3.272 Gross value added for section I is calculated by subtracting intermediate consumption from output (subtraction method), as is common practice with market production.

The following table 3–61 provides an overview of national accounts results in accommodation and food services section (WZ I) in the production approach.

Table 3–61: Derivation of national accounts results in the production approach

Section I: 'accommodation and food service activities'

Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
	Non-financial corporations and households (S.11/S.14)		
Source data.....	66.792	37.629	29.163
+ Data validation.....	0.000	0.000	0.000
= Sub-total.....	66.792	37.629	29.163
+ Own-account fixed capital formation.....	0.017	0.000	0.017
+ Changes in inventories of finished products and work in progress.....	0.000	0.000	0.000
= National accounts figures	66.808	37.628	29.180
+ Adjustments for exhaustiveness (N types)	6.206	1.620	4.586
= Balance sheet result	73.015	39.247	33.768
+ Conceptual changes	-1.542	-1.001	-0.541
= National accounts result	71.473	38.246	33.227
+ Macroeconomic balancing.....	0.000	-0.917	0.917
+ FISIM.....	0.000	0.873	-0.873
+ Research and development.....	0.000	0.000	0.000
= National accounts result (S.11/S.14)	71.473	38.202	33.271
	Financial corporations (S.12)		
+ National accounts result (S.12)	0.000	0.000	0.000
	General government (S.13)		
+ National accounts result (S.13)	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)		
+ National accounts result (S.15)	0.000	0.000	0.000
	Total economy (S.1)		
= Published figures.....	71.473	38.202	33.271

3.16 Information and communication (NACE Rev. 2: J)

3.273 In the production approach, calculations for the 'Information and communication' industry sector – newly created during the introduction of NACE Rev. 2 and/or WZ 2008 from other sectors in NACE Rev. 1.1 and/or WZ 2003 – are basically carried out in line with the six industry divisions (WZ 58, WZ 59, WZ 60, WZ 61, WZ 62, WZ 63) in sector J. Several industry divisions have already been combined for national accounts publishing purposes after conversion to WZ 2008.

The same calculation method is used for all divisions in the information and communication industry sector.

Viewed across all national accounts sectors, table 3–62 shows the results of the production approach for industry sector J and the corresponding industry divisions in 2010, some of which have been combined.

Table 3–62: Summary of the 'Information and communication' publication area (NACE Rev. 2 J)

Year 2010

Serial no	WZ 2008	Industrial classification	Output in EUR (billions)	Inter-mediate consumption	Gross value added				
					in EUR (billions)	Share in			
						GVA in industry	Total GVA	GDP	GNI
					in %				
1	J	Information and communication	215.078	111.733	103.345	100	4.5	4.0	3.9
2	JA	Publishing, audio-visual and broadcasting activities	58.99	30.543	28.447	27.5	1.2	1.1	1.1
3	58	Publishing	29.894	16.537	13.357	12.9	0.6	0.5	0.5
4	59-60	Audiovisual and broadcasting activities	29.096	14.006	15.09	14.6	0.6	0.6	0.6
5	JB	Tele-communications	71.344	43.872	27.472	26.6	1.2	1.1	1.0
6	JC	IT and information service providers	84.744	37.318	47.426	45.9	2.0	1.8	1.8

In terms of sectors, all economic output yielded in this section is exclusively from the non-financial corporations (S.11) and households (S.14) sectors.

Determining output

3.274 Turnover data from multiple official and non-official sources, sometimes concurrent, are available as the **source data basis** for determining **output** for all six industry divisions in sector J. The annual official sources include VAT statistics (based on

advance VAT returns as well as those based on assessments, which have a longer time interval), the statistical business register and the service structure survey. Profit and loss accounts from annual reports are also available for economically significant enterprises, such as Deutsche Telekom AG for the telecommunications sector (WZ 61). The ARD and ZDF yearbooks are available as further non-official data sources for the programming and broadcasting activities sector (WZ 60).

- 3.275 By weighing up the quality criteria such as exhaustiveness, accuracy and time availability, the structural survey in the service sector (SiD) (EVAS 47415) was selected as the main source of statistics to be used to calculate output for the six industry divisions of sector J, in the same way as for the transport and storage sectors (Chapter 3.14).
- 3.276 The service structure survey is a sample survey with a duty of disclosure. Compared to the other source data, the advantage of these statistics is that the results are not biased by tax groups in terms of economic activity classification, as can be the case with VAT statistics. Industry-specific classification of the surveyed units in line with NACE Rev. 2 is carried out in the services structure survey in accordance with the economic focus of the enterprise, measured on the basis of gross value added. This means that the WZ classification of this unit changes correctly if the main focus of economic activity of a unit changes or in the event of business field spin-offs for the unit. This method ensures that results by economic activity reflect reality as closely as possible. A further advantage of the service structure survey is that it covers almost all the indicators relevant for production approach.
- 3.277 Although, in terms of exhaustiveness in comparison to the service structure survey, the VAT statistics based on assessments (EVAS 73321) also include small enterprises, i.e. those with annual turnover below the (current) turnover threshold of EUR 17,500 per annum, the data from these statistics and currently also those from the statistical business register (EVAS 52111) are only made available with a time lag, respectively, of almost four years and three years after the end of the reporting period. Data from these two sources would therefore not be available for the original production approach calculations carried out every summer for the reporting year $t - 2$ years. By contrast, the service structure survey meets the quality criterion of time availability, as the results of this survey are basically available around 18 months after the end of the reporting period. The results for small enterprises from annual VAT assessment statistics can nevertheless still be used in output calculations to ensure exhaustiveness, in a later work phase described below.
- 3.278 The annual reports of Deutsche Telekom AG and the ARD and ZDF yearbooks for programming and broadcasting activities would also be available in time for the original production approach calculations. However, in comparison to the service structure survey, the disadvantage of this information is that it does not cover the entire industry division, only subsectors of a division.
- 3.279 Even though the turnover data in the service structure survey are used as the main source for calculating output in all six industry divisions of sector J, the results of all the other aforementioned sources are continuously observed, analysed and compared to the main source used, in order to check exhaustiveness.
- 3.280 Once the main data source to be used has been defined, the source data are then supplemented in the next work step as part of **data validation**, with turnover results for units that lie outside the scope of the service structure survey either in terms of industry or definition. The survey results are also adjusted to take account of incorrect attributions to economic sectors. These types of data validation are usually carried out at micro level and in close cooperation with the specialised service statisticians.

- 3.281 In terms of the information and communication divisions, this means the Federal Office for Post and Telecommunications (Bundesanstalt für Post und Telekommunikation) in division 61. Consultation with the relevant national accounts experts for the state budget is carried out before the validation of this unit in the non-financial corporations sector (S.11).
- 3.282 Furthermore, adjustments had to be made in 2010 to take account of the incorrect attribution of the Musical Performance and Mechanical Reproduction Rights Society (GEMA) within the scope of the service structure survey. This unit was incorrectly included in industry division 77 (Rental and leasing activities), but, given its industry activity features, it should belong to the industry division for motion picture, video and television programme productions (WZ 59). The relevant annual reports of these units are used as the data basis for the two aforementioned validations. A further data validation was carried out in the industry division for programming and broadcasting activities (WZ 60). Missing information about three broadcasters in North Rhine-Westphalia who were not subject to the duty of disclosure and/or did not respond had to be added to the results of the service structure survey in this division in 2010. This information was based on the corresponding results from the ARD and ZDF yearbooks. The assumptions for these units were made in close consultation with the North Rhine-Westphalia national accounts representative and the national accounts working group of the Federal States.
- 3.283 After data validation, own-account fixed capital formation and changes in inventories of work in progress and finished products (output) are then added to the turnover data previously calculated in order to determine output in the national accounts. The relevant national accounts experts provide data broken down accordingly into industry for the latter indicator to calculate changes in inventories. Own-account fixed capital formation is calculated on the basis of the service structure survey results for enterprises with an annual turnover of up to EUR 250 000. No data is directly available from these statistics for enterprises below this annual turnover threshold. To close these data gaps, the ratio of own-account fixed capital formation to gross fixed capital formation is determined for enterprises above the threshold, and this ratio is applied to smaller enterprises below the annual turnover threshold. This estimate is based on the assumption that the ratio of own-account fixed capital formation to total gross capital formation is similar for large and small enterprises.
- 3.284 In order to ensure **exhaustiveness in line with ESA**, the next work step involves further adjustments, some of which cover all the industry divisions in sector J (see Chapter 7 for details). This applies to allowances for under-reporting of the turnover of units in the information and communication sectors below the annual turnover threshold (EUR 17 500) in the service structure survey. The turnover of small enterprises as listed in VAT statistics is used as the data basis for calculating this allowance for exhaustiveness, based on assessments that are normally available four years after the end of the reporting year. Economic activity-specific allowance factors are generated for each division in the information and communication sectors, using the percentage ratio of small enterprise turnover to all turnovers in the assessment statistics, in order to estimate the corresponding turnover results from the service structure survey. Allowances are also made in the divisions of sector J for turnover relating to illegal employment, as well as the adjustment of own-account fixed capital formation for mark-ups.
- 3.285 Once the aforementioned adjustments for exhaustiveness have been added to output calculations, this provides the output for the individual industry divisions of sector J in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts, e.g. the production of copyright licences. **Own-account research**

and development is also to be taken into account for the non-financial corporations sector in terms of further ESA-compliant implementation (see Chapter 5.10.4 for more details about research and development calculations).

The following table shows the individual work steps for determining output for the six industry divisions in sector J for the integrated sectors of non-financial corporations and households (S.11/S.14) once again.

Table 3–63: Derivation of output by industry division

Section J: 'Information and communication'

Year 2010 in EUR (billions)

List	WZ 58	WZ 59	WZ 60	WZ 61	WZ 62	WZ 63	Section J
	Non-financial corporations and households (S.11/S.14)						
Source data	29.855	8.765	14.102	72.660	80.800	8.636	214.819
+ Data validation	0.000	0.857	1.763	0.184	0.000	0.000	2.804
= Sub-total	29.855	9.622	15.865	72.844	80.800	8.636	217.622
+ Own-account fixed capital formation.....	0.001	0.004	0.023	0.069	0.032	0.006	0.135
+ Changes in inventories of finished products and work in progress	-0.038	0.008	-0.052	0.204	0.297	0.036	0.456
= National accounts figures	29.819	9.634	15.836	73.117	81.129	8.678	218.213
+ Adjustments for exhaustiveness (N types)	0.262	0.078	0.063	0.138	0.605	0.080	1.227
= Balance sheet result	30.081	9.712	15.899	73.255	81.734	8.758	219.440
+ Conceptual changes	-0.187	3.276	0.209	-2.215	-6.701	-0.186	-5.804
= National accounts result	29.894	12.988	16.108	71.040	75.033	8.572	213.635
+ Macroeconomic balancing	0.000	0.000	0.000	0.000	0.000	0.000	0.000
+ FISIM	0.000	0.000	0.000	0.000	0.000	0.000	0.000
+ Research and development.....	0.000	0.000	0.000	0.304	1.139	0.000	1.443
= Output (S.11/S.14).....	29.894	12.988	16.108	71.344	76.172	8.572	215.078
	Financial corporations (S.12)						
+ Output (S.12).....	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	General government (S.13)						
+ Output (S.13).....	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)						
+ Output (S.15).....	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total economy (S.1)						
= Published figures	29.894	12.988	16.108	71.344	76.172	8.572	215.078

Determining intermediate consumption

- 3.286 The calculation of **intermediate consumption** for all six industry divisions of sector J is basically carried out using the same method as for determining output.
- 3.287 Alongside the results of the service structure survey, the profit and loss accounts in the annual reports of economically significant enterprises are also used each year as source data, e.g. Deutsche Telekom AG for subsectors in the telecommunications industry, as well as the ARD and ZDF yearbooks for programming and broadcasting activities.
- 3.288 The service structure survey is used as the main source for all information and communication industry divisions to determine intermediate consumption, as for output, on the basis of its exhaustive industry coverage.
- 3.289 The same data sources used to determine output are used to calculate intermediate consumption for the units added for the Federal Office for Post and Telecommunications, GEMA and the missing three broadcasters in North Rhine-Westphalia, as part of **data validation**. The national accounts figures for intermediate consumption are compiled by adding the source data and data validation, plus corresponding intermediate consumption for own-account fixed capital formation and changes in inventories of work in progress and finished products (input).
- 3.290 Intermediate consumption for further **adjustments for exhaustiveness** in line with ESA 2010 is basically determined using the respective industry-specific intermediate consumption ratio (calculated as a percentage ratio of intermediate consumption to output). Only half the corresponding intermediate consumption ratio is used for the allowance for illegal employment per industry division, given the lack of information.
- 3.291 Once the **conceptual changes** have been added to intermediate consumption, this provides the intermediate consumption for each industry division in line with national accounts concepts. In order to transpose the data to published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10).

Table 3–64 shows a summary of the individual intermediate consumption calculation phases for industry sector J once again for the integrated non-financial corporations and households sectors (S.11/S.14).

Table 3–64: Derivation of intermediate consumption by industry division

Section J: 'Information and communication'

Year 2010 in EUR (billions)

List	WZ 58	WZ 59	WZ 60	WZ 61	WZ 62	WZ 63	Section J
	Non-financial corporations and households (S.11/S.14)						
Source data	17.267	5.251	8.049	46.808	42.540	4.140	124.054
+ Data validation	0.000	0.051	1.312	0.030	0.000	0.000	1.393
= Sub-total	17.267	5.302	9.362	46.838	42.540	4.140	125.448
+ Own-account fixed capital formation	0.001	0.002	0.014	0.044	0.017	0.003	0.080
+ Changes in inventories of finished products and work in progress	-0.022	0.005	-0.030	0.131	0.156	0.017	0.257
= National accounts figures	17.245	5.309	9.345	47.013	42.713	4.160	125.785
+ Adjustments for exhaustiveness (N types)	0.076	0.025	0.018	0.044	0.167	0.021	0.351
= Balance sheet result	17.322	5.334	9.363	47.057	42.880	4.181	126.136
+ Conceptual changes	-0.592	-0.404	-0.040	-2.422	-8.372	-0.419	-12.249
= National accounts result	16.730	4.930	9.323	44.635	34.508	3.762	113.887
+ Macroeconomic balancing	-0.363	-0.222	-0.187	-0.729	-1.118	-0.133	-2.752
+ FISIM	0.170	0.079	0.083	0.372	0.455	0.062	1.221
+ Research and development	0.000	0.000	0.000	-0.406	-0.218	0.000	-0.624
= Intermediate consumption (S.11/S.14)	16.537	4.787	9.219	43.872	33.627	3.691	111.733
	Financial corporations (S.12)						
+ Intermediate consumption (S.12)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	General government (S.13)						
+ Intermediate consumption (S.13)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)						
+ Intermediate consumption (S.15)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total economy (S.1)						
= Published figures	16.537	4.787	9.219	43.872	33.627	3.691	111.733

Deriving gross value added

3.292 **Gross value added** for the individual industry divisions of sector J is calculated by subtracting intermediate consumption from output (subtraction method) for the integrated non-financial corporations and households sectors (S.11/S.14).

The following table shows the results for output, intermediate consumption and gross value added, summarised by individual calculation step for industry sector J.

Table 3–65: Derivation of national accounts results in the production approach
Section J: 'Information and communication'
Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
Non-financial corporations and households (S.11/S.14)			
Source data	214.819	124.054	90.765
+ Data validation	2.804	1.393	1.410
= Sub-total.....	217.622	125.448	92.175
+ Own-account fixed capital formation	0.135	0.080	0.054
+ Changes in inventories of finished products and work in progress.....	0.456	0.257	0.199
= National accounts figures	218.213	125.785	92.428
+ Adjustments for exhaustiveness (N types) .	1.227	0.351	0.876
= Balance sheet result	219.440	126.136	93.304
+ Conceptual changes	-5.804	-12.249	6.445
= National accounts result	213.635	113.887	99.748
+ Macroeconomic balancing	0.000	-2.752	2.752
+ FISIM.....	0.000	1.221	-1.221
+ Research and development.....	1.443	-0.624	2.067
= National accounts result (S.11/S.14)	215.078	111.733	103.345
Financial corporations (S.12)			
+ National accounts result (S.12)	0.000	0.000	0.000
General government (S.13)			
+ National accounts result (S.13)	0.000	0.000	0.000
Non-profit institutions serving households (S.15)			
+ National accounts result (S.15)	0.000	0.000	0.000
Total economy (S.1)			
= Published figures	215.078	111.733	103.345

3.17 Financial and insurance activities (NACE Rev. 2: K)

3.293 In the production approach, information about the 'Financial and insurance activities' industry section is basically published in line with the three industry divisions (WZ 64, WZ 65, WZ 66) in section K. Calculations are broken down further.

This generates the production approach results shown Table 3–66 for industry section K and its corresponding industry divisions.

Table 3–66: Summary of the 'Financial and insurance activities' publication area (NACE Rev. 2 K)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					in EUR (billions)	in EUR (billions)	Share in		
							GVA in industry	Total GVA	GDP
					in %				
1	K	Financial and insurance activities.....	240.275	133.983	106.292	100	4.6	4.1	4.0
2	64	Financial services.....	145.566	73.468	72.098	67.8	3.1	2.8	2.7
3	65	Insurance enterprises and pension funding.....	66.665	44.917	21.748	20.5	0.9	0.8	0.8
4	66	Activities auxiliary to financial services and insurance activities	28.044	15.598	12.446	11.7	0.5	0.5	0.5

3.294 Financial and insurance activities are basically treated in national accounts as intermediation activities. The main function of a deposit-taking corporation is to collect financial resources with a view to lending them in return for the payment of interest or investing them. Commercial insurers provide cover against particular risks by collecting premiums in order to compensate policyholders financially for loss or damage. For both sectors, the data required for determining output mainly comes from the supervisory bodies responsible for the banking and insurance industries whose functions ensure that they have access to regular and extensive information.

3.295 The financial corporations sector has been broken down further upon the introduction of ESA 2010. The following figure shows the connection between classification economic activities in accordance with NACE Rev. 2 (only shown here for WZ 64–66) and sector classification in accordance with ESA 2010 for the financial corporations sector (S.12):

Figure 3–6: Subdivision of the financial corporations sector

Sector/ industry	WZ 64 Financial service activities, except insurance and pension funding	WZ 65 Insurance, reinsurance and pension funding, except compulsory social security	WZ 66 Activities auxiliary to financial services and insurance activities
S.121	Central bank (WZ 64.11)		
S.122	Deposit-taking corporations (WZ 64.19)		
S.123	Money market funds (WZ 64.30)		
S.124	Investment funds (WZ 64.30) Investment management companies (WZ 64.99)		
S.125	Financial leasing (WZ 64.91) Special deposit-taking corporations (WZ 64.92) Other financial services (WZ 64.99)		
S.126	Other financial services (WZ 64.99)		All activities in WZ 66 with the exception of independent insurance brokers (S.14)
S.127	Holding companies (WZ 64.20)		
S.128		Insurance (WZ 65.1) Reinsurance (WZ 65.2)	
S.129		Pension funding (WZ 65.3)	

3.296 Even though most of the economic activities in sector S.12 take place in WZ 64–66, sector S.12 and industry section K do not always coincide. The financial corporations sector S.12 also includes:

- Housing services by financial corporations (WZ 68.2)
- Head offices, whose subsidiaries are all or predominantly financial corporations (WZ 70.10)
- Research and development (WZ 72) for the financial sector
- Membership organisations serving financial corporations (WZ 94.1).

The description below basically follows the classification of economic activities used as standard in the production approach.

3.17.1 Financial service activities, except insurance and pension funding (WZ 64)

1) Central bank (WZ 64.11)

- 3.297 The output of the central bank is, by convention, to be measured as the sum of 'administrative costs', i.e. its intermediate consumption, compensation of employees, consumption of fixed capital and other taxes less other subsidies on production. No FISIM is calculated for the central bank.
- 3.298 The part of the total central bank output (sum of costs less commissions and fees) that is not sold has to be allocated to the intermediate consumption of other deposit-taking corporations. A balancing entry is made here: the relevant intermediate consumption amount allocated to the deposit-taking corporation is to be counterbalanced by a current transfer from the central bank to the deposit-taking corporation for the same amount. Commissions and fees for central bank services will be allocated to the units making use of those services.
- 3.299 Profit-and-loss accounts published in the relevant annual report are used as data basis for calculating the output for the German Central Bank (Deutsche Bundesbank). Data for calculating intermediate consumption also come from this source.

Table 3–67: Derivation of gross value added for the Deutsche Bundesbank
Year 2010 in EUR (billion)

Cost of materials.....	0.252
+ Commission costs	0.017
+ Cost of printing paper currency	0.125
+ Other expenses.....	0.218
= Total intermediate consumption	0.612
+ Consumption of fixed capital	0.115
+ Compensation of employees	0.622
= Output	1.349
– Intermediate consumption.....	0.612
= Gross value added	0.737

2) Deposit-taking corporations (except special deposit-taking corporations) (WZ 64.19)

- 3.300 The output of deposit-taking corporations consists of two elements:
- Firstly, the services charged directly to customers, calculated in the same way as in other industry sections.¹⁸
 - For most financial services provided by deposit-taking corporations however, no direct charges are imposed; they are more often settled indirectly via the difference between interest earned and paid. As there are no data sources available to directly determine these services that are not explicitly charged

¹⁸ This also includes services for which fees are not charged directly, but are instead expressed as the difference between the issue and redemption price, for example.

for, this output element is determined indirectly using a model and described as FISIM¹⁹.

- 3.301 FISIM is part of output for deposit-taking corporations, but is also an intermediate consumption component for the industry sectors for enterprise sectors S.11, S.12 and S.14, a consumption expenditure components for sectors S.13, S.14 and S.15 and an export and import component for sector S.2, given its industry classification in user sectors. Given its special nature, FISIM accounting is described in detail in all its aspects in the following digression. The other sections where FISIM is relevant will then only include a reference to this digression.

Excursus on FISIM

- 3.302 The FISIM concept consists of two components. Firstly, the determination of the value of banking services produced and not explicitly charged for by deposit-taking corporations, and, secondly, the allocation of these banking services to the sectors that make use of them. Whether FISIM influences the amount and development of gross domestic product (GDP) and gross national income (GNI) depends on the economic unit that makes use of the banking service.
- For market producers, banking services are intermediate consumption in the production process, deducted when determining value added for these enterprises. GDP and GNI remain unaffected.
 - Banking services are also intermediate consumption for non-market producers controlled by the general government or non-profit institutions serving. However, given the calculation of non-market output by addition using expenditure items, this increases GDP and GNI.
 - For households, banking services are consumption expenditure and therefore also increase GDP and GNI.
 - If households make use of banking services in their role as owners of dwelling, these services are then deemed to be intermediate consumption for housing service entrepreneurship and do not affect GDP and GNI.
 - By contrast, the balance of cross-border banking services, reflected in the balance of exports and imports, affects GDP and GNI.
- 3.303 The determination of FISIM is based on the idea that there is an interest rate that is free from service charges (reference rate) and is the same for borrowers and depositors. However, borrowers do effectively pay interest that is increased by the addition of a service charge, while depositors actually receive an interest rate that is lower than the reference rate. The deposit-taking corporation retains the service charge attributed to the depositors. The interbank rate is viewed as a service-free reference rate. FISIM is calculated as the difference between the actual loan and deposit rates on one hand, and the loans and deposits valued using the reference rate on the other.
- 3.304 The fundamental method of determining FISIM is defined in Commission Regulation (EC) No 1889/2002 of 23 October 2002. These rules were also incorporated into ESA 2010 and more details were added in some areas.²⁰

¹⁹ FISIM – 'Financial Intermediation Services Indirectly Measured'

²⁰ See: Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013 on the European system of national and regional accounts in the European Union, Chapter 14.

- 3.305 First, the interest payments received and made by the deposit-taking corporation and its transaction partners are determined. Almost all interest flows for the deposit-taking corporations are determined using model calculations. Portfolios of assets and liabilities are weighted by type, maturities and sectors with corresponding interest rates.
- 3.306 The assets and liabilities, particularly loans and deposits, are taken from banking statistics. Sector changes are made on an individual basis. Particular reference should be made here to loans drawn on by general government bodies according to the rules of the National Accounts.
- 3.307 Interest rates are allocated to the (adjusted) loans and deposits of the deposit-taking corporations. The Deutsche Bundesbank's statistics on interest rates from the years 1991 to 2002 were used for this purpose. These statistics have now been replaced by new statistics on interest rates that are produced by the European Central Bank (from January 2003 onwards). The essential improvement in the suitability of the new interest rate statistics compiled by the European Central Bank with regard to the calculation of FISIM lies in the fact that now the statistics include not just the interest rates applied for new business in certain investment instruments (short-term loans, fixed term deposits, etc.), they also cover the average interest rates of portfolios by sector. However, there are no explicit interest rates for the non-profit institutions serving households and general government sectors. The non-profit institutions sector is therefore allocated the same interest rates as those used for calculating household interest. With general government deposits, it is assumed that the interest on these will be the same as for deposits by non-financial corporations. By contrast, general government loans are subject to an interest rate that is 1% lower than the rate used for non-financial corporations. This is based on the assumption that financing is cheaper for the government than for enterprises, given the good credit rating of the former.
- 3.308 Estimates of the deposit-taking corporation's interest revenue and expenses are obtained by combining the portfolio of loans and deposits with the corresponding interest rates.
- 3.309 The results of model calculations are replaced by more precise data on interest payments for the following transactions:
- Reliable information about interest received and paid by insurance companies and pension funds is taken from their accounts.
 - Data from the balance-of-payment statistics (EVAS 83111) are used for cross-border interest received and paid by deposit-taking corporations.
- 3.310 Interest flows from (domestic) interbank relations must be the same size, as interest payments by one domestic deposit-taking corporation to another must match what the recipient deposit-taking corporation receives as incoming interest. For this reason, the estimated value of the interest paid by domestic deposit-taking corporations to other domestic deposit-taking corporations is also used on the income side for the banking sector. The same procedure is applied to interbank assets and liabilities. Relevant is the value of interbank liabilities. The internal reference interest rate is from the result of the interbank liabilities and the interest paid by domestic deposit-taking corporations to other domestic deposit-taking corporations. A counter-entry in the same amount is made on the income side for the deposit-taking corporation. It is assumed that this internal reference rate is relevant for all domestic banking services output, i.e. the exported services as well. The reason for this is that German deposit-taking corporations primarily issue loans to foreign non-banks in EUR. Three separate external reference rates are determined just to calculate the import of banking services.

- 3.311 When the loans and deposits of the deposit-taking corporations according to sector are multiplied by the reference rate, the difference from the actual interest income and expenditure (after all modifications and adjustments) represents the service charge. The result is presented in the following table.

**Table 3–68: FISIM output for domestic deposit-taking corporations
by transaction partner**
Year 2010 in EUR (billions)

Sector code	Description	Total FISIM	FISIM on loans	FISIM on deposits
S.11	Non-financial corporations.....	15.295	7.696	7.599
S.12 (others)	Financial corporations, not including FISIM producers.....	3.805	0.711	3.094
S.13	General government.....	1.559	0.094	1.465
S.14a	Households (consumers)	26.522	7.419	19.103
S.14b	Households (owner-occupiers of dwellings).....	14.850	14.850	–
S.14c	Households (individual entrepreneurs).....	12.886	10.126	2.760
S.15	Non-profit institutions serving households	1.152	0.365	0.787
S.2	Export	8.312	4.922	3.390
Total	FISIM output.....	84.381	46.183	38.198

- 3.312 According to WZ 2008, the WZ 64.19 class includes the acceptance of deposits or close substitutes for deposits, as well as the issuing of loans. FISIM output is determined for this class alone in Germany. In the other WZ 64 classes, financial intermediation activities are not considered the main activity of the units classified herein, as the enterprises would otherwise have to be considered deposit-taking corporations. The proportion of financial intermediation activities that WZ 64.9 enterprises carry out is comparatively low, meaning that there is no need for a separate FISIM calculation. This is particularly the case in Germany, as financial leasing in the sense of the ESA not relevant here.
- 3.313 Although the term 'financial leasing' is used in German economic reality, the contractual arrangement of such agreements in Germany does not comply with the definition of financial leasing as defined in ESA. In practice in Germany, financial leasing is based on a basic lease term of between 40% and 90% of the duration of depreciation for wear and tear. The agreements are usually configured so that accounting for the leasing object can continue with the lessor.
- 3.314 The definition of financial leasing in ESA 2010 differs from this. Here, the financial leasing transaction is an agreement in which all risks and rewards of ownership of the leasing object are passed to the lessee. 'Under a financial lease, the lessor is deemed to make, to the lessee, a loan with which the lessee acquires the asset. Thereafter the leased asset is shown on the balance sheet of the lessee and not the lessor' (ESA 2010, 5.134). In practice, German financial leasing is more like a lease agreement. For this reason, it is recorded in industry division 77, in the same way as operating leasing.
- 3.315 However, in addition to domestic FISIM output – which already covers loan and deposit transactions between domestic deposit-taking corporations and non-resident

economic units – the values for services imported in relation to loan and deposit transactions between domestic non-banks and foreign deposit-taking corporations must also be determined. Estimates here are based on data from the Deutsche Bundesbank regarding the financial assets and liabilities of German non-banks in relation to foreign deposit-taking corporations, as well as IMF interest statistics. Calculations are broken down to Euro-area countries, European non-Euro countries and third countries. The external reference rates here are the average interest rate of those interest rates that apply to loans and deposits. This results in the following service charges for imported banking services:

Table 3–69: FISIM import by domestic users
2010 in EUR (billions)

Sector code	Description	Total FISIM	FISIM on loans	FISIM on deposits
S.11/S.12	Corporations	2.837	1.131	1.706
S.13	General government.....	0.391	0.320	0.071
S.14a	Households (consumers)	0.094	-	0.094
S.14c	Households (individual entrepreneurs)	0.097	-	0.097
Total	FISIM import	3.419	1.451	1.968

As mentioned above, FISIM has a varying effect on gross domestic product and gross national income, depending on which economic unit makes use of the banking services.²¹

- 3.316 The contribution of FISIM to gross national income in 2010 was around EUR 29.7 billion. The effect is often lower than its contribution to gross domestic product. This is because FISIM accounting has an entirely negative effect on the balance of primary income. This effect is offset by its inversely positive effect on the balance of exports and imports in the same amount.

Table 3–70: FISIM effect on gross domestic product and gross national income
2010 in EUR (billions)

FISIM contribution to...	
Household final consumption expenditure.....	26.616
Final consumption expenditure of non-profit institutions serving households.....	1.152
General government final consumption expenditure	1.950
Total (= effect on GNI).....	29.718
FISIM balance of exports and imports.....	4.893
Total (= effect on GDP).....	34.611

²¹ For a detailed description of these relationships, see: Eichmann, Wolfgang 'Finanzserviceleistung, indirekt Messung (FISIM)' in *Wirtschaft und Statistik*, 7/2005, Pages 710-716, Wiesbaden 2005.

- 3.317 Overall, gross national income only changes as a result of changes in the final national uses of products. However, the transition from cross-border primary income to cross-border services has an impact on gross domestic product. Furthermore, primary income figures increased by service charges require compensatory services transactions to mirror these rises, which also change gross domestic product.
- 3.318 Alongside FISIM allocation to user sectors, intermediate consumption FISIM must also be allocated to industry section, in order to continue showing gross value added by industry section. As no information is available about enterprise loans and deposits by industry section, such an allocation can instead be based on the output of the industry sections, as indicated in Commission Regulation (EC) No 1889/2002 of 23 October 2002.

End of the excursus

- 3.319 The deposit-taking corporations listed in WZ 64.19 comprise the following banking groups:

- Commercial banks
- Central giro institutions
- Savings banks
- Central cooperative banks
- Mortgage banks
- Deposit-taking corporations with special functions
- Credit cooperatives
- Building societies

- 3.320 The main data source for directly calculating value added in this sector is the statistics on the profit and loss accounts of deposit-taking corporations²² (EVAS 47261) compiled by the Deutsche Bundesbank, to which all deposit-taking corporations are required to submit their accounts. These statistics provide information about the aforementioned banking groups, including building societies.

The gross value added of deposit-taking corporations in 2010 was as follows:

Table 3–71: Gross value added of deposit-taking corporations

Year 2010

	EUR billion
FISIM	84.381
+ Incidental sales (excluding housing)	45.043
+ Own-account software	0.334
+ Own-account R&D	0.050
= Output	129.808
– Intermediate consumption	62.927
= Gross value added	66.881

²² See the monthly report of the Deutsche Bundesbank for September of each year.

- 3.321 Revenues from incidental sales and own-account fixed capital formation must be added to FISIM in order to determine total output for this subsector. Incidental sales are as follows:

Table 3–72: Determining incidental sales for deposit-taking corporations

Year 2010	
	EUR billion
Commissions receivable	42.848
+ Revenue from commodity trade (net)	0.170
+ Other operating revenue (20 %) (excluding housing)	2.105
– Non-life insurance claims	0.080
= Total incidental sales	45.043

- 3.322 Source data are taken from profit and loss account statistics of deposit-taking corporations and building societies compiled by the Deutsche Bundesbank . An estimated share of 20% of other operating income is attributed to output. In addition, around EUR 0.3 billion was added to output calculations for deposit-taking corporations for own-account software (as non-market production) and EUR 0.05 billion was added for own-account research and development, taken from the calculation of capital formation in fixed assets (see section 5.10.3).
- 3.323 The same profit-and-loss accounts of the deposit-taking corporations and building societies are also used as a data source for calculating **intermediate consumption**. The following items are included as intermediate consumption:

Table 3–73: Determining intermediate consumption for deposit-taking corporations

Year 2010	
	EUR billion
Commissions payable	13.765
+ Other administrative expenses	36.341
+ Other operating expenses (excluding housing expenditure)	11.635
– Net non-life insurance premiums	0.080
+ Central bank output ²³ (S.121)	1.282
+ Research and development	– 0.016
= Intermediate consumption	62.927

- 3.324 Net non-life insurance premiums are excluded from the expenditure of deposit-taking corporations, and consequently only the service charge for insurance services is

²³ Less the commissions receivable for the central bank, as these are already included in the expenditure items for deposit-taking corporations.

ultimately taken into account as intermediate consumption of these corporations. Furthermore, the proportion of central bank output that is not sold is attributed to the intermediate consumption of the deposit-taking corporations.

- 3.325 An adjustment is required, since, according to the profit-and-loss accounts, intermediate consumption items also include expenditure for own-account research and development, because these are added from a separate calculation for gross value added.

The gross value added of the deposit-taking corporations mentioned above is calculated by subtracting intermediate consumption from output.

3) Other financial service activities in WZ 64

- 3.326 This subsector of financial services covers a wide range of different activities: holding companies, funds, financial leasing corporations, guarantee banks, pawn shops, investment companies and other financial intermediaries.

Table 3–74: Derivation of results for other financial intermediaries

Sub-classes of WZ 64	Output	Intermediate consumption	Gross value added
Holding companies (WZ 64.20).....	0.026	0	0.026
+ Trusts, funds and similar financial entities (WZ 64.30).....	5.130	5.130	0
+ Special deposit-taking corporations (WZ 64.92.1).....	0.111	0.005	0.106
+ Pawn shops (WZ 64.92.2).....	0.058	0.020	0.038
+ Other financial intermediaries n.e.c (WZ 64.99.9).....	9.084	4.774	4.310
= Total	14.409	9.929	4.480

a) Activities of holding companies (WZ 64.20)

- 3.327 In the context of the introduction of ESA 2010, it was stated that holding companies are to be allocated to the financial sector S.12, irrespective of the sector classification of the shares they hold. The main objective of this new method in ESA 2010 is to compile information on economic links using shareholdings as part of financial accounts (Deutsche Bundesbank). This must then also be reflected in non-financial accounts when calculating value added, as well as in investment income in particular (income distributed to/from holding companies). The following recommendations were developed within the framework of a task force (Eurostat, ECB, OECD, DE, other EU countries) in order to define holding companies and the difference between these and management holdings, specified in even greater detail by the subsequent classification task force:

- (1) the unit holds at least 50% of shares in its subsidiaries;
- (2) the unit has few employees (< 3);
- (3) the unit has low turnover (< EUR 250 000);
- (4) the unit does not carry out management activities for the group.

These criteria for defining holding companies cannot be used in Germany for positive selection, since balance sheet data is not linked to the business register and therefore the first criterion cannot be checked. Criteria (2) and (3) could be used instead, but neither turnover nor the number of employees allows for clear differentiation between holding companies and management holdings. Case-by-case checks are required for criterion (4).

During the 2011 National Accounts benchmark revision, the business register in WZ 64.20 was evaluated in order to determine holding companies with management activities which should be classified as non-financial enterprises (S.11/S.14). This evaluation, using number of employees and turnover (no case-by-case checks), indicated that 87% of the units in WZ 64.20 were not purely holding companies. These units were transferred proportionally from WZ 64.20 to WZ 70.10. Where these units had a significant number of employees and/or significant turnover, it is assumed that they carry out entrepreneurial activities alongside any existing pure holding of shares. The proportion of turnover listed in the business register (87% of total turnover in WZ 64.20) was allocated to WZ 70.10 in the production approach for the entire period from 1991, and therefore to the non-financial corporations sector (S.11).

3.328 Value added calculations are now carried out for the remaining units in WZ 64.20 (13% of units) that belong to S.12 in conceptual terms, for the first time since the 2014 revision. The following assumptions can be made when determining value added for pure holding companies:

- (1) The number of units on the holding list compiled by the Deutsche Bundesbank is used as the benchmark for value added calculation, in order to ensure consistency between the non-financial and financial accounts.
- (2) There is no consumption of fixed capital or intermediate consumption in addition to gross value added.
- (3) Each holding company is estimated to have two employees.
- (4) The level of compensation of employees for these two employees is assumed to match the average compensation of employees in WZ 64.

Using the input approach, this results in a value added of around EUR 26 million for 2010.

b) Trusts, funds and similar financial entities (WZ 64.30)

3.329 A fund is basically a special asset managed by an investment company. It is assumed that investment funds sell a service to investors that they receive at the same value from the investment fund managers (investment companies). The gross value added of the investment fund thus equals zero. Investment fund intermediate consumption corresponds to the output of investment companies (see the section on WZ 64.99 below and the section on WZ 66.30 for details about calculating output for investment management companies). Interest (D.41) and distributed income of corporations (D.42) as income flows are also recorded for the special asset.

c) Other financial service activities (WZ 64.9)

- Financial leasing (WZ 64.91)

3.330 Leasing contracts in Germany are usually configured in compliance with leasing decrees. This also applies to leasing contracts that are classified as financial leasing. Compliance with leasing decrees means that the contracts are designed in such a way as to take the four leasing decrees of the Federal Ministry of Finance into consideration, thus activating the leased property in the balance sheets of the lessor.

In turn, this means that the lessor is not only the legal but also the economic owner of the leased property.

Configuring contracts in compliance with the relevant decrees is desirable both for the lessee and the lessor, as this is associated with advantages for both sides.

By contrast, the ESA defines a financial leasing transaction as a contract in which all risks and benefits of ownership of the leased property are conveyed to the lessee.²⁴ 'Under a financial lease, the lessor is deemed to make, to the lessee, a loan with which the lessee acquires the asset. Thereafter the leased asset is shown on the balance sheet of the lessee and not the lessor' (Paragraph 5.135). Table 15.1 in ESA also states: 'The user is the economic owner of a non-financial asset, financed by a loan from the lessor. The payments are for the most part re-payment of principal and payments of interest on the loan.'

As German financial leasing contracts largely do not correspond to the ESA definitions of a financial leasing transaction, no financial leasing is recorded in WZ 64.91, irrespective of the identical name in the National Accounts.

- Other credit granting (WZ 64.92)

- 3.331 Special deposit-taking corporations (WZ 64.92.1) and pawn shops (WZ 64.92.2) are also classified as financial corporations that issue loans. Many other credit granting corporations (mortgage banks such as private mortgage banks or corporations with special functions, such as the Kreditanstalt für Wiederaufbau [Credit Institution for Reconstruction]) are to be classified as deposit-taking corporations and therefore included in WZ 64.19. For example, guarantee banks fall within the definition of WZ 64.92.1.. As they fall within the definition of the Banking Act (Gesetz über das Kreditwesen – KWG), they are monitored by the supervisory authorities and aggregated data on balance sheets and profit-and-loss accounts is available.

Output and intermediate consumption are calculated for guarantee banks (WZ 64.92.1) as shown below, using 2010 as an example:

Table 3–75: Determining gross value added for guarantee banks

Year 2010 in EUR (billions)

Output	0.111
Commissions receivable.....	0.096
Other operating income.....	0.015
– Intermediate consumption	0.005
Commissions payable	0.001
Other administrative expenses.....	0.015
Other operating expenses	0.004
Minus: Income from write-ups for receivables and certain securities, as well as from the dissolution of reserves in loan transactions.....	0.015
= Gross value added	0.106

²⁴ See the European System of Accounts ESA 2010, Chapter 5.134 et seq. and 15.14 et seq. and Table 15.1.

Information about pawnshops (WZ 64.92.2) is available from the Central Association of the German Pawn Credit Business (Zentralverband des deutschen Pfandkreditgewerbes). Output is determined from the data on the number and amount of loans issued and the number and amount of loans that must be auctioned. According to expert reports, the various charges for this service add up to a total sum of 36% p.a. of the original loan amount. A surcharge of 10% is added to cover vehicle pawnbrokers that do not belong to the Central Association of the German Pawn Credit Business. Based on information from the association the intermediate consumption ratio was set at 35% for 2010. This resulted in an output of EUR 58 million and intermediate consumption of EUR 20 million for 2010. Gross value added in 2010 was EUR 38 million.

- Other financial service activities n.e.c. (WZ 64.99)

3.332 While, in terms of institutional units, ESA 2010 differentiates between the managers of investment funds (Paragraph 2.96 h) which belong to sector S.126 Financial auxiliaries and the investment funds themselves, the industrial classification system for economic activities does not separate these units. In terms of sectors, investment funds may therefore be classified as money market funds (S.123) or non-MMF investment funds (S.124). Duplicate entry is therefore used in the classification of areas of economic activity in order to comply with the institutional classification requirements of ESA 2010, but this has no effect on gross value added. According to the model assumption, investment funds sell a service to investors that they receive at the same value from the investment fund managers (investment companies) as intermediate consumption. The gross value added of the investment fund thus equals zero. The intermediate consumption of the investment fund corresponds to the output of the investment fund manager. Calculations for investment companies are shown in detail under WZ 66.30, in which they are also recorded.

This industry class also includes factoring enterprises and authorised dealers. Since these are financial activities subject to supervision, aggregated profit and loss account data are also available from the Deutsche Bundesbank for various activities within this industry class.

Output and intermediate consumption of the other financial intermediaries n.e.c. (WZ 64.99.9) are determined as follows:

Table 3–76: Determining gross value added for other financial intermediaries

Year 2010 in EUR (billion)

Output	9.084
Commissions receivable.....	1.383
Other operating income	7.701
– Intermediate consumption	4.774
Commissions payable	0.183
Other administrative expenses.....	0.778
Other operating expenses.....	3.879
Minus: Income from write-ups for receivables and certain securities, as well as from the dissolution of reserves in loan transactions	0.066
= Gross value added	4.310

3.17.2 Insurance, reinsurance and pension funding, except compulsory social security (WZ 65)

- 3.333 Insurance activities are basically subject to a special treatment in National Accounts. Insurance companies act as intermediaries: the insurance company receives a premium from the policyholder and retains it until either the insured event takes place or the insurance period expires. The policyholder's premium is invested by the insurance company and earns investment income. The insurance company calculates the premium amount so that the total of premiums plus the investment income earned, less the expected claims payments, leave a margin that can be retained by the insurance company for its intermediation services. In National Accounts, this margin represents the output of the insurance companies, otherwise known as their service charge. Any income from other services and own-account fixed capital formation are also added to the service charge.
- 3.334 Gross value added of the insurance company is calculated by deducting intermediate consumption from the total of these items (output).
- 3.335 Industry division 65 is divided into three groups: insurance, reinsurance and pension funding. The insurance group covers two categories: life insurance and non-life insurance. Non-life insurance is subdivided into health, indemnity and accident insurance. Calculations are carried out and shown separately for the individual classes, i.e. life insurance, health insurance, indemnity and accident insurance, reinsurance and pension funding. This entirely separate calculation has been carried out for reinsurance since the introduction of ESA 2010.

The results, subdivided by insurance classes, are as follows:

Table 3–77: Derivation of gross value added for the insurance industry

Year 2010 in EUR (billions)

Insurance class	Service charge from premiums	Other charges	Intermediate consumption	GVA
	Output			
Life insurance (WZ 65.11)	15.257	3.846	12.957	6.146
+ Health insurance (WZ 65.12.1)	5.720	1.151	4.470	2.401
+ Indemnity and accident insurance (WZ 65.12.2)	26.427	4.247	21.725	8.949
+ Reinsurance (WZ 65.20)	6.713	1.141	4.338	3.516
+ Pension funding (WZ 65.30)	1.301	1.523	0.849	1.975
= Sub-total	55.418	11.908	44.339	22.987
– Housing		0.790	0.140	0.650
+ FISIM		0	0.735	– 0.735
+ Research and development		0.129	– 0.017	0.146
= Insurance, reinsurance and pension funding (WZ 65)		66.665	44.917	21.748

- 3.336 Data sources here are the forms and records made available to the Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht – BaFin) in line with the 'Regulation on Reporting by Insurance Undertakings to the Federal Financial Supervisory Authority' (Versicherungsberichterstattungs-Verordnung – BerVersV) and/or the 'Regulation on Reporting by Pension Funds to the Federal Financial Supervisory Authority' (Pensionsfondsberichterstattungs-Verordnung – BerPensV). They are made available to the Federal Statistical Office by the Federal Financial Supervisory Authority (BaFin) as so-called internal accounting documents.
- 3.337 Data on the following insurance companies, which are not subject to this reporting obligation, are also analysed:
- Occupational pension schemes
 - Public service supplementary pension funds
 - Health insurance schemes operated by Deutsche Bahn AG and Deutsche Post AG
- 3.338 Data on the occupational pension schemes and public service supplementary pension funds are taken from the statistical data compiled by the Arbeitsgemeinschaft für kommunale und kirchliche Altersversorgung e.V. (Association for municipal and church pension schemes), the Arbeitsgemeinschaft berufsständischer Versorgungswerke e.V. (Association of professional pension funds) and the annual report by the Versorgungsanstalt des Bundes und der Länder. Data are also available on the health insurance scheme for public servants at Deutsche Bahn as well as postal public servants.

3.17.2.1 Life insurance (WZ 65.11)

3.339 The service charge from premiums is calculated as follows for life insurance companies (table 3–78):

**Table 3–78: Determining the service charge from premiums
(life insurance companies)**
Year 2010 in EUR (billion)

Gross premiums written	86.722
– Reinsurance commissions	0.070
+ Premiums from the provision for rebates	3.434
+ Premium supplements	28.727
+ Revenue arising from the reduction of specific gross insurance technical reserves	– 0.001
+ Change in the gross provision for unearned premiums	0.095
– Gross expenditure on settlement of claims paid	50.074
– Gross expenditure on policy redemptions paid	12.850
– Gross expenditure on rebate of premiums	10.603
– Gross allocation to provision for claims	0.177
– Gross allocation to provision for claims settlement	0.001
– Gross allocation to redemption provisions	– 0.020
– Gross allocation to redemption provisions for settlement	0.001
– Gross allocation to reserves for rebate of premiums	0.055
– Gross amount of life assurance provision	36.764
– Expenditure arising from increases in specific gross insurance technical reserves	0.191
+ Share capital gain/loss balance	7.046
= Service charge from premiums	15.257

The premiums items and the change in provisions for unearned premiums can be taken directly from the basic tables in the internal accounts. Premium supplements is an estimated value that does not appear in the insurance companies' accounts, but is instead derived from items in annual reports for National Accounts purposes; it is designed to reflect an imputed rate of interest applied to policyholders' financial entitlements. The first step is the calculation of a figure for total revenue, comprising the following items:

- Interest income
- Dividend income
- Net rents from commercial or residential land used by third parties

It is assumed that the liability to be assigned to the policyholders for the payment of interest is part of the aforementioned total revenue, as a percentage derived from the ratio of insurance technical reserves to the aggregate balance sheet total for the corresponding insurance companies in each insurance class (in 2010, for example, this came to 91.4% for life insurance companies).

3.340 **Other service charges** by life insurance companies are as follows:

Table 3–79: Other service charges (life insurance companies)

Year 2010 in EUR (billion)

Other insurance technical gross income.....	1.148
+ Other income.....	1.823
+ Income from land used by others	0.832
+ Own-account software.....	0.043
= Other service charges	3.846

3.341 **Intermediate consumption** of life insurance companies is calculated as follows:

Table 3–80: Intermediate consumption (life insurance companies)

Year 2010 in EUR (billion)

Commissions.....	6.569
+ Payments for temporary agency workers	0.005
+ Remuneration for purchased services used	2.991
+ Other material expenses.....	1.386
+ Net cost of ceded reinsurance	0.395
+ Other gross insurance technical expenses	0.372
+ Other expenses	-0.044
+ External services.....	1.373
- Income from owner-occupied land	0.090
= Intermediate consumption	12.957

The intermediate consumption figures can be derived directly from business accounting costs by expenditure type in the internal accounts. Commissions and other income for insurance representatives for their own business and for transactions carried out as intermediaries for other insurance companies are considered to be purchases of services, and are therefore to be considered as intermediate consumption. Reinsurance commissions, wages and salaries, super commissions to employees, social security contributions and expenses for other welfare benefits, expenditure on pensions and support and other personnel expenditure are not considered to be intermediate consumption and are to be deducted from the total expenditure. However, payments for temporary agency workers are services purchased from third parties, and are therefore part of intermediate consumption. Remuneration for purchased services and other material expenses are also part of intermediate consumption.

The cost of ceded reinsurance for life insurance companies is added to intermediate consumption, as are the other gross insurance technical expenses and other expenses. Expenditure for investment management is recorded as external services as well and also enters intermediate consumption. The imputed rents for owner-occupied real estate are deducted from intermediate consumption.

3.17.2.2 Health insurance (WZ 65.12.1)

- 3.342 The data obtained from health insurers' internal accounts are supplemented by details of the premiums received and payments made by the in-house health insurance funds of the German Postal Service and German Railways. This, however, does not affect the value of the **service charge from premiums**, since the premiums received by these funds are equal to the payments made. The service charge element of health insurers' income from premiums is calculated as follows::

**Table 3–81: Determining the service charge from premiums
(health insurance companies)**

Year 2010 in EUR (billion)

Gross premiums written	33.283
– Reinsurance commissions	0
+ Premiums from the provision for rebates	2.915
+ Premium supplements	7.086
+ Revenue from the reduction of specific gross insurance technical reserves.....	0
+ Change in gross provision for unearned premiums.....	–0.006
+ Health insurance for German Postal Service and Railways employees.....	1.177
– Gross expenditure on settlement of claims paid.....	20.734
– Gross expenditure on policy redemptions paid	0
– Gross expenditure on rebate of premiums.....	4.230
– Gross allocation to provision for claims.....	0.245
– Gross allocation to provision for claims settlement	0.014
– Gross allocation to redemption provisions	0
– Gross allocation to redemption provisions for settlement	0
– Gross allocation to reserves for rebate of premiums.....	–0.471
– Gross allocation to actuarial reserves.....	12.693
– Expenditure arising from increases in specific gross insurance technical reserves.....	0.004
– Health insurance for German Postal Service and Railways employees.....	1.177
+ Share capital gain/loss balance	–0.109
= Service charge from premiums.....	5.720

The method for determining the individual items corresponds to the calculation method used for life insurance companies. The ratio of insurance technical reserves to the balance sheet total, which is used as weighting for the total revenue in the valuation of premium supplements, amounted to 95% in 2010 for health insurance companies.

3.343 **Other service charges** by health insurance companies include the following components:

Table 3–82: Other service charges (health insurance companies)

Year 2010 in EUR (billion)

Other gross insurance technical income.....	0.158
+ Other income	0.867
+ Income from land used by others	0.107
+ Own-account software.....	0.019
= Other service charges	1.151

3.344 As for **intermediate consumption**, calculations for the service charge by health insurance companies are carried out using the same method as used for calculations for life insurance companies.

Table 3–83: Intermediate consumption (health insurance companies)

Year 2010 in EUR (billion)

Commissions.....	1.970
+ Payments for temporary agency workers	0.010
+ Remuneration for purchased services used	1.430
+ Other material expenses.....	0.760
+ Net cost of ceded reinsurance	0.027
+ Other gross insurance technical expenses	0.182
+ Other expenses	-0.082
+ External services.....	0.183
- Income from owner-occupied land	0.010
= Intermediate consumption	4.470

3.17.2.3 Indemnity and accident insurance (WZ 65.12.2)

3.345 Data from internal accounts are used as the data source for indemnity and accident insurance calculations. The **service charge** of the indemnity and accident insurance companies is calculated as follows:

**Table 3–84: Determining the service charge from premiums
(indemnity and accident insurance companies)**

Year 2010 in EUR (billion)

Gross premiums written	61.271
– Reinsurance commissions.....	0.750
+ Premiums from the provision for rebates.....	0
+ Premium supplements	3.948
+ Revenue arising from the reduction of specific gross insurance technical reserves	0.078
+ Change in the gross provision for unearned premiums.....	– 0.207
– Fire protection tax	0.305
– Gross expenditure on settlement of claims paid	35.928
– Gross expenditure on policy redemptions paid	1.178
– Gross expenditure on rebate of premiums.....	0.465
– Gross allocation to provision for claims.....	0.786
– Gross allocation to provision for claims settlement.....	0.189
– Gross allocation to redemption provisions	0.004
– Gross allocation to redemption provisions for settlement	0
– Gross allocation to reserves for rebate of premiums.....	– 0.014
– Gross allocation to actuarial reserves.....	0.336
– Expenditure arising from increases in specific gross insurance technical reserves.....	0.205
– Change in the equalisation provision	– 0.560
+ Share capital gain/loss balance	0.909
= Service charge from premiums	26.427

The method for determining the listed items corresponds to the calculation method used by life insurance companies. The ratio of insurance technical reserves to the balance sheet total –used as weighting to calculate the premium supplements – amounted to 70.1% in 2010 for indemnity and accident insurance companies.

3.346 **Other service charges** by indemnity and accident insurance companies consist of the following items:

Table 3–85: Other service charges (indemnity and accident insurance companies)

Year 2010 in EUR (billion)

Other gross insurance technical income	0.189
+ Other income.....	4.009
+ Income from land used by others	0.170
+ Own-account software	0.079
– Claims payments	0.200
= Other service charges	4.247

Calculations are carried out in line with the method used for life insurance companies, in the same way as for the intermediate consumption calculations below.

- 3.347 The following items are considered **intermediate consumption** for indemnity and accident insurance companies:

Table 3–86: Intermediate consumption (indemnity and accident insurance companies)

Year 2010 in EUR (billion)	
Commissions.....	9.390
+ Payments for temporary agency workers	0.020
+ Remuneration for purchased services.....	6.000
+ Other material expenses.....	3.080
+ Net cost of ceded reinsurance	1.658
+ Other gross insurance technical gross expenses	0.126
+ Other expenses	1.483
+ External services.....	0.308
– Income from owner-occupied land	0.140
– Net premiums.....	0.200
= Intermediate consumption	21.725

3.17.2.4 Reinsurance (WZ 65.20)

- 3.348 Reinsurance companies have been treated in the same way as direct insurance companies since the introduction of ESA 2010, in line with calculations for indemnity and accident insurance. Data from internal accounts are similarly used as the basis for calculating service charges.

**Table 3–87: Determining the service charge from premiums
(reinsurers)**

Year 2010 in EUR (billion)

Gross premiums written	43.307
– Reinsurance commissions.....	11.041
+ Premiums from the provision for rebates.....	0
+ Premium supplements	4.630
+ Revenue arising from the reduction of specific gross insurance technical reserves	0.017
+ Change in the gross provision for unearned premiums.....	– 0.688
– Fire protection tax.....	0.067
– Gross expenditure on settlement of claims paid.....	26.257
– Gross expenditure on policy redemptions paid	1.671
– Gross expenditure on rebate of premiums.....	0.035
– Gross allocation to provision for claims.....	2.159
– Gross allocation to provision for claims settlement	0.014
– Gross allocation to redemption provisions	0
– Gross allocation to redemption provisions for settlement	0
– Gross allocation to reserves for rebate of premiums.....	0
– Gross allocation to actuarial reserves.....	0.047
– Expenditure arising from increases in specific gross insurance technical reserves.....	0.036
– Change in the equalisation provision	0.083
+ Share capital gain/loss balance	0.857
= Service charge from premiums	6.713

The method for determining the listed items corresponds to the calculation method used for the other insurance classes. The ratio of insurance technical reserves to the balance sheet total, which is used as weighting to calculate the premium supplements, amounted to 47.4% in 2010 for reinsurers.

3.349 **Other service charges** by reinsurers consist of the following items:

Table 3–88: Other service charges (reinsurers)

Year 2010 in EUR (billion)

Other gross insurance technical income.....	0.093
+ Other income.....	0.857
+ Income from land used by others.....	0.139
+ Own-account software	0.052
= Other service charges	1.141

Calculations are carried out in line with the method used for the other insurance classes, in the same way as for the intermediate consumption calculations below.

3.350 The following items are considered **intermediate consumption** for reinsurers:

Table 3–89: Intermediate consumption (reinsurers)

Year 2010 in EUR (billion)

Commissions.....	0.037
+ Payments for temporary agency workers	0.008
+ Remuneration for purchased services used	1.085
+ Other material expenses.....	0.752
+ Net cost of ceded reinsurance	0.709
+ Other gross insurance technical expenses	0.138
+ Other expenses	- 0.097
+ External services.....	1.736
- Income owner-occupied land.....	0.030
= Intermediate consumption	4.338

3.17.2.5 Pension funding (WZ 65.30)

3.351 Data about pension funding subject to the supervision of the Federal Financial Supervisory Authority (BaFin) can also be taken from internal accounts. Furthermore, estimates are used for occupational pension schemes and public service supplementary pension funds.

3.352 The **service charge from premiums** for pension funding is calculated as follows, in line with the method used for life insurance companies:

**Table 3–90: Determining the service charge from premiums
(pension funding)**

Year 2010 in EUR (billion)

Gross premiums written	32.373
– Reinsurance commissions	0
+ Premiums from the provision for rebates	0.501
+ Premium supplements	12.277
+ Revenue arising from the reduction of specific gross insurance technical reserves	0
+ Change in the gross provision for unearned premiums	0.001
– Gross expenditure on settlement of claims paid	18.732
– Gross expenditure on policy redemptions paid	0.152
– Gross expenditure on rebate of premiums	0.770
– Gross allocation to provision for claims	0.020
– Gross allocation to provision for claims settlement	0
– Gross allocation to redemption provisions	– 0.001
– Gross allocation to redemption provisions for settlement	0
– Gross allocation to reserves for rebate of premiums	0.058
– Gross allocation to actuarial reserves	26.123
– Expenditure arising from increases in specific gross insurance technical reserves	0.019
+ Share capital gain/loss balance	2.022
= Service charge element of premiums income	1.301

All items adding up to form the premium supplements are determined using the same method as described for life insurance companies. Once again, weighting is carried out with the ratio of insurance technical reserves to the balance sheet total, in order to estimate the interest payable to the policyholders. In 2010, the ratio for pension funding and its estimated components was 76.7%. The method for calculating all other items does not differ from the method used for life insurance companies.

3.353 The **other service charges** for pension funding consist of the following items and are determined in the same way as those for life insurance companies.

Table 3–91: Other service charges (pension funding)

Year 2010 in EUR (billion)

Other gross insurance technical income	0.693
+ Other income	0.035
+ Income from land used by others	0.793
+ Own-account software	0.002
= Other service charges	1.523

3.354 **Intermediate consumption** for pension funding is also calculated using the same method as described for life insurance companies. The following items were included as intermediate consumption:

Table 3–92: Intermediate consumption (pension funding)

Year 2010 in EUR (billion)

Material administrative costs (supplementary pension schemes)	0.270
+ Commissions	0.115
+ Remuneration for purchased services used	0.190
+ Other material expenses	0.170
+ Net cost of ceded reinsurance	0.009
+ Other gross insurance technical expenses	0.055
+ Other expenses	– 0.128
+ External services	0.178
– Income owner-occupied land	0.010
= Intermediate consumption	0.849

3.17.3 Activities auxiliary to financial services and insurance activities WZ 66

3.355 Industry division 66 covers the provision of services closely related to those of deposit-taking corporations and insurance companies, but not incorporating either of these. In German National Accounts, this includes the Deutsche Börse Group, the Federal Financial Supervisory Authority (BaFin), the securities and commodities trade (loan brokers, securities brokers, investment advisers) and other activities auxiliary to financial services. The activity of insurance brokers and independent insurance brokers is part of this economic activity, as does fund management (management of pension funding and investment funds).

Table 3–93: Derivation of gross value added for WZ 66

Year 2010 in EUR (billions)

Groups of WZ 66	Output	Intermediate consumption	Gross value added
Activities auxiliary to financial services (WZ 66.1)	4.630	1.860	2.770
+ Activities auxiliary to insurance (WZ 66.2)	18.044	7.218	10.826
+ Fund management activities(WZ 66.3)	5.130	3.315	1.815
= Total	27.804	12.393	15.411
+ FISIM	0	3.212	– 3.212
+ Research and development	0.083	– 0.007	0.090
+ Own-account software	0.157	0	0.157
= Activities auxiliary to financial services and insurance activities	28.044	15.598	12.446

a) Activities auxiliary to financial services (WZ 66.1)**Stock and commodity exchanges (WZ 66.11.0)**

- **Deutsche Börse Group**

3.356 The figures with relevance for National Accounts can be derived from internal accounts data from the annual report for the Deutsche Börse Group. The entire Group is analysed and included in the calculations (instead of the German share in the Deutsche Börse Group alone), in order to counteract any under-reporting in WZ 66.

Table 3–94: Derivation of gross value added for the Deutsche Börse Group

Year 2010 in EUR (billions)

Output	2.253
Sales revenue.....	2.106
Own work capitalized	0.045
Net interest income from banking business.....	0.060
Other operating income.....	0.042
– Intermediate consumption	0.569
Commission expenses from banking	0.211
Other operating expenses.....	0.415
Minus:	
Non-deductible input tax	0.034
Expenses resulting from exchange differences.....	0.009
Non-wage labour costs and voluntary social benefits.....	0.009
Supervisory Board remuneration.....	0.005
= Gross value added	1.684

- **Federal Financial Supervisory Authority (BaFin)**

3.357 BaFin has been assigned to the financial sector since 2002 and is listed here as industry class 66.11, which also includes the monitoring of financial markets.

Data for calculating the figures with relevance for National Accounts can be taken from internal accounting data in the annual budget plan published by the Federal Financial Supervisory Authority.

Output consists of administrative and other income and reached EUR 0.143 billion in 2010. Intermediate consumption consists of material administrative expenditure and amounts to EUR 0.021 billion.

Gross value added is calculated as the subtraction of intermediate consumption from output, and is EUR 0.122 billion for the Federal Financial Supervisory Authority for 2010.

Security and commodity contracts brokerage (WZ 66.12) and other activities auxiliary to financial services (WZ 66.19)

- 3.358 The annual accounts and profit and loss accounts of enterprises subject to supervision by the Deutsche Bundesbank in line with the Banking Act (Kreditwesengesetz) are used as the data basis for calculating gross value added. These are units that issue loans to households, as well as investment advisers, contract brokers, operators of multilateral trading platforms and placement business services. The data is provided by the Deutsche Bundesbank in aggregated form.

Table 3–95: Derivation of gross value added for WZ 66.12 and 66.19

Year 2010 in EUR (billions)

Output	1.674
Commissions receivable.....	1.577
Other operating income.....	0.097
– Intermediate consumption	0.840
Commissions payable	0.380
Other administrative expenses	0.414
Other operating expenses	0.048
Minus: Income from write-ups for receivables and certain securities, as well as from the dissolution of reserves in loan transactions	0.002
= Gross value added	0.834

Activities related to the processing and settlement of financial transactions (including credit card transactions), for which no information is available from the aforementioned source, are estimated separately. Information from the former Gesellschaft für Zahlungssysteme (payment systems company) was used for this purpose up until 2002. This information has been extrapolated since 2003. Gross value added for these activities amounts to EUR 0.130 billion in 2010.

b) Activities auxiliary to insurance and pension funding (WZ 66.2)

Activities of insurance agents and brokers (WZ 66.22.0)

- 3.359 According to § 51 para 5 of the Regulation on the Accounting of Insurance Companies (Verordnung über die Rechnungslegung der Versicherungsunternehmen, RechVersV) of 8 November 1994, insurance companies should provide information about the commission and other remuneration paid to insurance representatives in the sense of § 92 of the German Commercial Code (HGB), as well as the data from insurance

technical accounts. This information is provided broken down by insurance class. The amounts specified in this information concerning commission from primary insurers correspond to the output of independent insurance representatives used in National Accounts. The intermediate consumption ratio is set at 40%.

The results of VAT statistics (advance VAT returns, EVAS 73311) are taken into account when this amount is allocated to sectors S.126 (Financial auxiliaries) and S.14 (Households). The turnover (deliveries and services) specified in the VAT statistics for the whole of WZ 66 is interpreted here as turnover for the independent insurance brokers belonging to S.12 who are liable to submit VAT returns. The difference between the total output for insurance brokers and the turnover of insurance brokers liable to submit VAT returns equals the output of the insurance brokers who belong to S.14.

Performance-based remuneration for insurance brokerage to employees who are part of the insurer's external sales force are part of the salaries and wages that insurance companies record in their accounts. Sales representatives are therefore considered as employees of the insurance company in National Accounts and are not included in the aforementioned calculation. Remuneration for insurance brokerage between insurance companies is part of non-insurance technical accounts and is recorded as other income or other expenses in the profit and loss accounts of the insurance companies. This remuneration is taken into account elsewhere in calculations and therefore does not play any role here either.

The output of insurance brokers in 2010 is EUR 18.044 billion and intermediate consumption is EUR 7.218 billion. This results in gross value added of EUR 10.826 billion for 2010.

c) Fund management activities WZ 66.3

- 3.360 The output and intermediate consumption of investment company managers are calculated on the basis of aggregated profit-and-loss accounts provided by the Deutsche Bundesbank.

Table 3–96: Derivation of gross value added for WZ 66.3

Year 2010 in EUR (billions)

Output	5.130
Commissions receivable	4.858
Other operating income	0.272
– Intermediate consumption	3.315
Commissions payable	2.065
Other administrative expenses	1.125
Other operating expenses	0.131
Minus: Income from write-ups for receivables and certain securities, as well as from the dissolution of reserves in loan transactions.....	0.006
= Gross value added	1.815

3.18 Real estate activities (NACE Rev. 2: L)

3.361 Industry section L corresponds to the real estate activities industry division (WZ 68) in accordance with NACE Rev. 2 and/or WZ 2008, as this section only covers one industry division. National accounts results are published in line with the special national accounts breakdown A*64 in NACE Rev. 2 for industry section L.

Real estate activities (NACE Rev. 2 section L and/or WZ 68) are basically calculated in the production approach broken down into the following industry groups:

68.1 Buying and selling of own real estate

68.2 Renting and operating of own or leased real estate

68.3 Real estate activities on a fee or contract basis

Calculations for these industry groups do not include housing services. In some areas, it is therefore necessary to break down value added calculation into further groups (by industry class and/or sub-class). Various calculation methods are used, depending on the source data. 'Housing services' is a separate accounts item that also includes owner occupied dwellings, and is described in a separate sub-section of this section (3.18.2).

Viewed across all national accounts sectors, including housing services, table 3–97 shows the results of the production approach for industry section L (WZ 68) in 2010.

**Table 3–97: Summary of the 'Real estate activities' publication area
(NACE Rev. 2 L)**

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					in EUR (billions)	in EUR (billions)	Share in		
			GVA in industry	Total GVA			GDP	GNI	
1	L	Real estate activities ...	361.146	93.867	267.279	100	11.5	10.4	10.2

In terms of sectors, this industry sector includes non-financial corporations (S.11), financial corporations (S.12) and households (S.14) as well as general government (S.13). S.12 and S.13 are included exclusively in the model calculations for housing services. See Chapter 3.21 for details about calculations for the general government sector (S.13) for output, intermediate consumption and gross value added.

The published figures for all sectors (S.1) are formed by adding the respective sector national accounts data.

3.18.1 Real estate activities (excluding housing services)

Determining output

- 3.362 The determination of output in the real estate activities sector is split into two areas. The entire output arising in relation to the use of housing stock is determined separately using a model in the housing services account item (WZ 68.20.1), and added to WZ 68. The output for all economic activities in this area that are not related to housing services is determined in parallel to this. In order to avoid double counting, it is thus necessary to initially eliminate housing services from source data when determining output for industry sector L.
- 3.363 Turnover data from multiple official sources, sometimes concurrent, are available as the **source data basis** for determining **output** for the industry groups and classes (not including housing services) in sector L. The annual official sources include VAT statistics (based on advance VAT returns (EVAS 73311) and, with a longer time interval, those based on assessments (EVAS 73321)), the statistical business register (EVAS 52111) and the structural survey in the service sector (SiD) (EVAS 47415).
- 3.364 The VAT statistics based on assessments also include small enterprises, i.e. those with annual turnover below the (current) turnover threshold of EUR 17 500 per annum. However, the results of these statistics and, currently, those of the statistical business register as well, are only made available with a time lag of almost four years/three years after the end of the reporting period. Data from these two sources would therefore not be available for the original production calculations carried out every summer for the reporting year $t - 2$ years. The results for small enterprises from annual VAT assessment statistics can nevertheless still be used in output calculations to ensure exhaustiveness, in a later work phase described below. By contrast, the VAT statistics (advance VAT returns) meet the quality criterion of time availability, as the results of this survey are basically available around 18 months after the end of the reporting period. For this reason, and given the greater exhaustiveness of the VAT statistics in comparison to the service structure survey (SiD), the VAT statistics were selected as the main source of statistics to be used to calculate output in industry sector L (excluding housing services).
- 3.365 The following method is used to adjust the VAT statistics results for the element of turnover from housing services contained in those statistics:

In sector WZ 68.20.1 'Renting and operating of own or leased real estate', output is calculated without housing services, with only the taxable turnover in the VAT statistics being taken into account, as tax-free turnover in this sector is income from housing services. In terms of the taxable turnover used, it is assumed that this mainly comes from secondary activities, not housing services.

By contrast, tax-free turnover is also included in sub-sector 68.3 'Real estate activities on a fee or contract basis'; however, a 50% adjustment is deducted for income from housing services. Taxable turnover is used to calculate output in all other sectors of WZ 68. The turnover figures in VAT statistics for this sub-sector are higher than the turnover figures in service statistics for 2010, as in other years; the difference in 2010 is around EUR 38 billion. It can therefore be assumed that the VAT statistics are the more comprehensive data source in this case.

Even though the turnover data in the VAT statistics (advance VAT returns) are used as the main source for calculating output (not including housing services) in industry division WZ 68, the results of all the other aforementioned sources are continuously observed, analysed and compared to the main source used, in order to check exhaustiveness.

- 3.366 Once the main data source to be used has been defined using the VAT statistics (advance VAT returns), the source data are then supplemented in the next work step as part of **data validation**, with turnover for units that belong to the general government sector in the national accounts in order to avoid duplicate sector records. This type of validation is only carried out after consultation with the relevant national accounts experts for the state budget. In industry sector L, this means the Institute for Federal Real Estate (Bundesanstalt für Immobilienaufgaben, BIMA). BIMA, recorded in VAT statistics in WZ L, is part of the general government sector in national accounts (S.13). For this reason, BIMA turnover as reported in the 'statistics of public funds, institutions and enterprises' (ÖFEU) is deducted from the VAT statistics turnover data as part of data validation.
- 3.367 Changes in inventories of work in progress and finished products (output) are then added to the turnover data previously calculated in order to determine output in the national accounts (excluding housing services). The relevant national accounts experts provide data broken down accordingly into industry for the calculation of changes in inventories. Own-account fixed capital formation is not significant in this sub-calculation in sector L.
- 3.368 In order to ensure **exhaustiveness in line with ESA 2010**, the next work step involves further adjustments, some of which cover all the industry groups in industry sector L (see Chapter 7 for details). For example, this applies to allowances for under-reporting of the turnover of units below the annual turnover threshold (EUR 17 500) in the VAT statistics (advance VAT returns). The turnover of small enterprises as listed in VAT statistics is used as the data basis for calculating this allowance for exhaustiveness, based on assessments after t - 4 years. Allowances for turnover from illegal employment are also made in industry sector L. Proportional implementation (10%) of the turnover earned by corporations for financial leasing (WZ 64.91) from real estate leasing is also carried out as part of adjustments for exhaustiveness (see Chapter 3.20 for details).
- 3.369 Once the aforementioned adjustments for exhaustiveness have been added to output calculations, this provides the output for the industry divisions of industry sector L in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts, e.g. recording the net value of goods bought for resale. Own-account research and development is also basically to be taken into account for the non-financial corporations sector, in terms of further ESA-compliant implementation (see the chapter 10.5.4 for more details about research and development calculations). Own-account research and development was of no significance in value terms for industry sector L in 2010.

Determining intermediate consumption

- 3.370 The calculation of **intermediate consumption** for all three industry groups in sector L (excluding housing services) for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output. The main source of data is the annual results of the service structure survey (SiD).
- 3.371 Corresponding expenditure is determined during **data validation** using the same method as for determining output. The national accounts figures for intermediate consumption are compiled by adding the source data and data validation, plus corresponding intermediate consumption for changes in inventories of work in progress and finished products (input).

- 3.372 Intermediate consumption for further **adjustments for exhaustiveness** in line with ESA 2010 is basically determined using the respective industry-specific intermediate consumption ratio (calculated as a ratio of intermediate consumption to output). Only half the corresponding intermediate consumption ratio is used for the allowance for illegal employment per industry sector, given the lack of precise information.
- 3.373 Once the **conceptual changes** have been added to intermediate consumption, this provides the intermediate consumption for the industry sector in line with national accounts concepts. In order to transpose the data into published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10.4).

Deriving gross value added

- 3.374 Gross value added for industry sector L (excluding housing services) is calculated by subtracting intermediate consumption from output (subtraction method) for the integrated non-financial corporations and households sectors (S.11/S.14).

3.18.2 Housing services

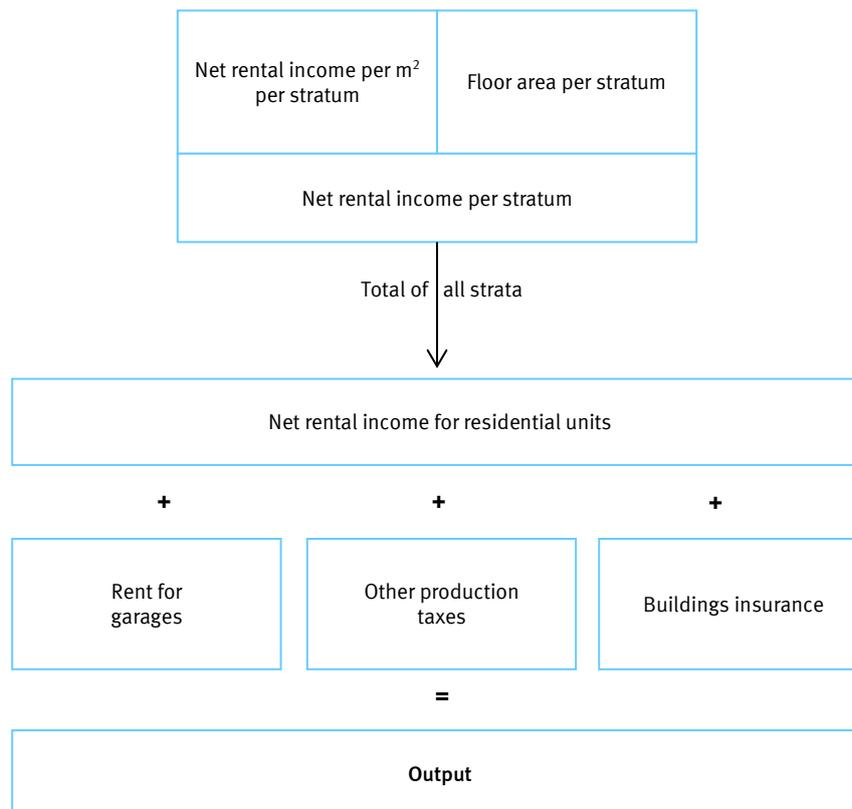
- 3.375 Housing services are considered separately in functional terms, i.e. all transactions relating to the letting of dwellings are recorded under economic activity (WZ) 68.20.1. It covers all letting of residential accommodation (irrespective of ownership), owner occupied dwellings, holiday homes (not including holiday homes used on a commercial/hotel basis) and garages/parking spaces linked to dwellings. In conceptual terms, housing services are invariably regarded as a statistical unit in their own right, irrespective of whether their provision is the principal or secondary activity of an economic unit. Based on the data, this approach facilitates full statistical coverage of the activities in connection with housing services. The consequence of this approach, however, is that care must be taken to ensure that the assessment of gross value added in all other areas of activity excludes housing services so that the contribution of these services is not counted twice. The imputed rents for owner occupied dwellings are determined using comparative rents for rented dwellings with a similar size, location, furnishing and quality. The stratification method is used here in compliance with Regulation (EC) No 1722/2005.

A dwelling or residential unit consists of one room or multiple contiguous rooms that are closed off from the outside, serve residential purposes and allow for independent household management. Most dwellings are in residential buildings, with the rest in non-residential buildings, e.g. caretaker dwellings in buildings otherwise predominantly used for commercial purposes. They also include self-contained residential units in residential facilities (e.g. student halls of residence, retirement homes, nurses' homes or residential homes for mothers and children), as well as holiday homes. Rooms in barracks, garden houses or caravans are also considered to be dwellings if people live in them permanently and have no other dwelling place. Office premises and practices, workshops, accommodation in caves, prisons, hospitals or clinics and rooms in retirement homes, care homes, residential facilities for the disabled and children's homes are not considered to be dwellings if they do not allow for household activities. These dwellings are considered to be institutional dwellings. Empty dwellings are not included in the output calculations for housing services. Holiday homes and second homes that are only used occasionally are not considered to be empty and are included in calculations.

Determining output

3.376 Output is determined in multiple steps, as shown in Figure 3—7. The main indicator for output is the rent without additional charges (net rent). This is determined using the volume/price model. Data on the floor area (volume), differentiated by characteristics (strata), are multiplied by the corresponding average net rent per square metre (price). The floor area and price per square metre are determined in separate work steps, as various different data sources are available. The total net rent calculated in this way for the individual strata is the first component for output. The output for garages and/or parking spaces and for other production taxes and insurance premiums not included in the extrapolated net rent is then added. They are determined in separate calculations.

Figure 3—7: Determining output for housing services



(1) Determining floor area

3.377 Net rent is determined using the stratification method. Broken down significantly into different levels, the volume (i.e. floor area in square metres) is calculated separately for leased dwellings and those used by the owners. As net rent is used as a price parameter in the next accounts step, the characteristics selected here to create the strata are those that have a significant effect on rent. Investigations using tabular analysis have shown that various structures relating to

- the size of the dwelling
- the year in which the building was built
- regional factors

have a significant effect on rent. In comparison to the previous stratification, the 2014 revision has now introduced the size of the local authority district as a new

stratification characteristic. Given the significant differences in rents in urban and rural areas, even within a single Federal state (Bundesland), this means a fundamental improvement in the criterion for regional differentiation. A new category for large dwellings was also introduced on the basis of the increase in average floor area per residential unit in terms of dwelling size. This means a total of 504 strata for Germany. Figure 3–9 shows the stratification characteristics that are used to evaluate the current source statistics for volume and price components.

Figure 3–8: Stratification characteristics

Stratification characteristics			
Size of the dwelling in square meters	Population size of the municipality	Age of the building	Region
<ul style="list-style-type: none"> – 40 and smaller – 41 to 80 – 81 to 120 – above 120 	<ul style="list-style-type: none"> – Below 20 000 – From 20 000 to fewer than 100 000 – 100 000 and more 	<ul style="list-style-type: none"> – Prior to 1948 – From 1949 to 1990 – 1991 and newer 	16 Federal states (Länder)
504 strata in total of which: 36 strata per federal state (Land) 12 strata per city state			

- 3.378 Population and housing censuses (GWZ) (EVAS 31211) are used as the data basis for determining housing stock, ensuring exhaustive recording of this housing stock. These housing censuses are carried out at lengthy intervals and supply data for so-called benchmark years, which are then extrapolated until the next census using suitable indicators. Holiday homes are included in the housing censuses by number of residential units and floor area, meaning that no separate calculation is required for them. They are stratified and included in output calculations in the same way as all other dwellings. The benchmark years for earlier periods are 1987 for the old Federal states in the 1987 population and housing census (GWZ 1987) and 1995 for the new Federal states in the 1995 population and housing census carried out only in those states (GWZ 1995). Current deep-structured new data is available from a census of housing stock for the benchmark year 2011, (GWZ 2011). Using this data the complete time series was revised in the 2014 major revision.
- 3.379 The quantity structure (number and area of dwellings) for the five new states and East Berlin was revised back to 1996. The floor area results remained unchanged for 1991 to 1995, based on GWZ 1995 carried out in the new states. The quantity structure was revised back to GWZ 1987 for the old states, including Berlin West. However, as the output for 1991 for the old states was to remain changed in the 2014 revision, the changes for the old states only stretch back to 1992 (see below for further explanation).

The following Table 3–98 shows the number of dwellings and their floor area on average in 2010, taken from the stock extrapolation in national accounts. The floor area of occupied residential units is definitive when calculating output, subdivided into rented and owner-occupied units.

Table 3–98: Average number and floor area of dwellings in 2010

	Dwellings	Floor area	Floor area per dwelling
	1 000	mill. m ²	m ²
Total housing stock	40 449	3 667	91
Empty residential units.....	1 823	136	75
Occupied residential units.....	38 626	3 530	91
Rented dwellings.....	21 360	1 510	71
Owner-occupied dwellings	17 267	2 021	117

- 3.380 All occupied and empty dwellings are recorded as the source data for stock extrapolation, excluding buildings used entirely for commercial purposes, diplomatic residences and the homes of foreign armed forces personnel. When determining output, an adjustment is made for empty dwellings in a separate work step. Information about building completions and stock withdrawals is taken from official statistics on construction activity (EVAS 311) at Federal state level for extrapolation as of 2011 and/or to determine the number and area of dwellings in the years between the results of the population and housing censuses. However, these data are not sufficiently differentiated so as to show all the stratification characteristics described above. A reduced number of strata is therefore assumed for the years between the censuses. The data from construction activity statistics are grouped into strata, that is, separately by Federal State (*Bundesland*), rented dwellings, owner-occupied dwellings and year of construction (before or after 1949). This yields 32 strata for rented and another 32 strata for owner-occupied dwellings for the years between the housing censuses.
- 3.381 However, the cumulative balances of housing stock additions and withdrawals in construction activity statistics do not exactly match the changes in stock calculated as the difference between the GWZ 2011 stocks and the GWZ 1987 (old states) and/or GWZ 1995 stock (new states). Correction factors were therefore calculated for interpolation in the years between the censuses and used to adjust stock changes in the construction activity statistics, so that the cumulative stock changes correspond to the difference between the various housing censuses. Newly added dwellings and/or floor area created by building completions minus dwelling or floor area withdrawals are used as the basis for extrapolation as of 2011.
- 3.382 Only the total floor area stock minus the floor area for empty dwellings is definitive when calculating output. Buildings used entirely for commercial purposes, diplomatic residences and the homes of foreign armed forces personnel are, as indicated above, already excluded from source data from GWZ, and are therefore not part of stock extrapolation. However, empty dwellings must still be eliminated from GWZ. Information about the number of empty dwellings is available in the 1987, 1995 and 2011 population and housing censuses, the 1993 dwellings census carried out throughout Germany and the microcensus additional surveys for 2002, 2006 and 2010. Only the number of empty dwellings was recorded in these surveys. GWZ 2011 also surveyed the floor area of empty dwellings for the first time. The number and floor area of empty dwellings were also revised for past years in the 2014 revision.
- 3.383 Survey errors had to be corrected in the empty dwellings data from the microcensus. In the microcensus additional housing surveys that surveyed the households living in the dwellings, the interviewers carrying out the survey also recorded as empty rented but

unoccupied dwellings (e.g. where people were moving house) or potential also owner-occupied dwellings, if no one was living in them at the time of the interview. Based on the survey method, the possibility cannot be excluded that the interviewers even recorded permanently occupied dwellings (e.g. those where the residents are absent for a long period) as empty incorrectly. Given the vacancies results in GWZ 2011, the vacancy rates from the microcensus additional surveys housing had to be significantly adjusted downwards, with a corresponding increase in the number of occupied dwellings. The ratio between the state-specific vacancy rates in GWZ 2011 and the rates according to the 2010 microcensus additional housing survey was used as the basis for adjusting all microcensus additional surveys. The vacancy rates were interpolated on a linear basis for the years for which no data are available. The information available for the first time about the average dwelling size of empty dwellings in GWZ 2011 was taken into account in another step, keeping the ratio of average dwelling size of empty dwellings to the average dwelling size of all housing stock in May 2011 constant for the entire time range. These calculations are also carried out separately for each Federal state.

- 3.384 The total number of residential units and/or floor area (including holiday homes), extrapolated and rewritten using construction activity statistics, was adjusted by the number of empty dwellings and their average floor area. The floor area of occupied dwellings determined in this way is valued at the corresponding average prices per square metre, stratified in line with the aforementioned stratification characteristics.

(2) Determining net rental income per square metre

- 3.385 The volume/price model described above for determining net rent requires the net rent per square metre as a price component, as well as the floor area as a volume component. The average net rental incomes per square metre of rented main tenant dwellings (market rent) are used as comparative rents for owner-occupied dwellings, excluding those made available at a discount or free of charge. This market rent is also used for dwellings made available at a discount or free of charge, as well as for holiday homes, which are valued at market rent in the same way as owner-occupied dwellings.
- 3.386 Although GWZ 1995 (new Federal states only) and GWZ 2011 provide detailed data on the number of dwellings and their floor areas, they do not contain any information about the rent amount. The following data sources are available for determining average rents per square metre:
- GWZ 1987 (housing census only in old states)
 - Dwellings survey (WS) 1993 (1% dwellings survey in Germany)
 - Microcensus additional housing surveys on living situations in 2002 and 2010 (1% survey of households) (EVAS 12212)
 - Price statistics data for interpolation for the years between surveys and/or current extrapolation
 - Annual statistics compiled by the Federation of German Housing Enterprises
- 3.387 The following process was used for the current benchmark year 2011:

In the first step, the 504 possible strata in the quantity structure were integrated, given the insufficient numbers of individual cases for a few individual strata in the microcensus additional surveys. This leads to a reduction from a possible 504 to 431 actual strata available for the net rental income of tenant households as a comparative rent for owner-occupied dwellings.

In the second step, the net rent per square metre was extrapolated from the 2010 microcensus additional survey for the 431 actual strata used, based on the

development of the price statistics consumer price indices, classified by Federal state at the time of GWZ 2011. Although GWZ 2011 contains no rent data, it does contain detailed information about floor area in its capacity as a full survey, whereas the microcensus additional surveys provide a biased representation of the actual dwellings structure, given their 1% survey base. The floor area used as a weighting factor in the relevant stratum (431 strata) was replaced with the data from GWZ 2011, meaning that the dwelling structure data in GWZ 2011 is definitive in terms of weighting. This balanced out any structural bias. The determined net rental income per square metre figures are then compressed into 32 strata each for rented and owner-occupied dwellings (Federal states and buildings constructed before or after 1949) for extrapolation.²⁵

- 3.388 There are three benchmark years for calculations for the years before 2010: 2002, with the results of the 2002 microcensus additional housing survey; 1993, with dwellings survey data (WS 1993); and, for the old states, 1987, when rent was also recorded as part of the population and housing census. Before 2002, it was therefore WS 1993 that was definitive. Interpolation was carried out up to 2002 using WS 1993, based on price statistics information.²⁶ Quarterly price indices from consumer price statistics are also used for calculations for the years between 2002 and 2010. The same applies to calculations from 2010 onwards.
- 3.389 Only pure price changes from one period to another are taken into account in consumer price statistics. However, price changes triggered by changes in quality are not reflected in price index calculations. It cannot be denied that changes in quality as the result of modernisations in housing stock also play a part in the development of actual market rents. However, opposing developments could occur if housing stock is not maintained sufficiently and this causes the quality level of the housing stock to suffer.
- 3.390 Tenants or lessors need to be surveyed about rent prices for rented dwellings at certain time intervals in order to reflect both pure price development and quality changes. In Germany, net rent for rented dwellings – as described above – is determined at four-yearly intervals in microcensus additional housing surveys, which then allows the revision of the last three years before the survey. This means quality changes not included in price statistics can also be taken into account. Rents per square metre from the last available survey can then be extrapolated on a current basis with the price indices from consumer price statistics. Any adjustment required can only be carried out once the next survey is available.
- 3.391 The aforementioned calculations and adjustments carried out result in the average net rental income per square metre for each stratum. These results are multiplied by the floor area per stratum determined in (1) to give the extrapolated net rental income as the total of all strata.
- 3.392 As the result for all strata, the net rental income per square metre and month for tenant households is EUR 5.36 and the imputed rent for owner-occupied dwellings is EUR 4.92. The reason for the generally lower average rents for owner-occupied dwellings is

²⁵ Specific correction factors for both construction age classes were then calculated by way of comparing the two results after compression (32 extrapolated strata, divided into rented and owner-occupied dwellings), with weighting via dwelling structure from GWZ 2011 and dwelling structure from the 2010 microcensus additional housing survey. These correction factors were used to adjust the results from the 2002 and 2010 microcensus additional surveys.

²⁶ GdW information on rent development was also taken into account when extrapolating WS 1993 for the new Federal states.

that these are often found more frequently in rural areas than in urban areas where tenant dwellings are more dominant and rents are higher. Owner-occupied dwellings are also generally larger on average than tenant-occupied dwellings. The rent per square metre is higher for smaller dwellings.

(3) Special assessment for garages and parking spaces linked to dwellings

- 3.393 Garages and/or parking spaces used by tenants and owner-occupiers are to be taken into account in housing services output where they are linked to the relevant dwellings. For example, garages are not taken into account if they have been leased or sold due to their proximity to a workplace.
- 3.394 The rent per garage/space per month in WS 1993, divided into owner-occupied and tenant households and also subdivided by Federal state, is used to calculate garage and/or parking space rent as the basis for extrapolation and revision. The imputed parking space rents for garages/parking spaces used by owner-occupiers are determined in line with the method used for net rental income for rented garages/parking spaces (stratification method). WS 1993 is currently still the only source that provides representative information about the number of garages/parking spaces and the rent per garage/parking space.
- 3.395 The extrapolation and revision of garage rents per parking space from WS 1993 are based on state-specific price indices from consumer price statistics. Extrapolation of the number of garages/parking spaces is carried out on the basis of the state-specific proportions of rented/owner-occupied dwellings with garages/parking spaces. These proportions, calculated from the results of WS 1993, are retained throughout the entire period. The nominal garage rents are determined by multiplying the rent per parking space by the number of garages/parking spaces.
- 3.396 While the number of occupied residential units has risen overall by approx. 8.5% between 1993 and 2010, the number of garages/parking spaces has grown by a good 10% in the same period. This is mainly attributable to changes in the composition of rented and owner-occupied dwellings. As the proportion of owner-occupied dwellings – approx. 80% of which have a garage/parking space (rented dwellings approx. 38%) – has risen in the total number of occupied dwellings, the number of garages/parking spaces has risen more sharply than the number of dwellings in the selected extrapolation method.

(4) Other production taxes and insurance premiums for buildings insurance

- 3.397 Real estate tax B is taken into account as the only other production charge for housing services. It is charged on developed land, whether developed for residential or commercial purposes. As it is not part of net rental income, it is determined separately and added to output.
- 3.398 Actual property tax B (Grundsteuer B) revenue is recorded in the tax statistics (EVAS 71211). However, the entire revenue amount is not to be added for housing services, as property tax B is also payable for commercial property. Property tax B is divided into residential and commercial property by evaluating individual building type data provided for the first time for 2011 in public finance statistics. In 2011, 62.5% of total property tax B revenues came from dwellings. The ratio of net capital stock for dwellings to total buildings in the wealth accounting in national accounts is used as an indicator to extrapolate and revise this figure. Property tax B is subdivided by individual Federal state into rented and owner-occupied dwellings using the relevant net rental income at fixed prices.

3.399 The insurance premiums for residential buildings insurance (actual premiums paid) are also part of output in national accounts.²⁷ As these are not included in net rent, with the costs being passed on to the tenants as part of their additional charges for housing, they must be determined separately and added to net rental income. The total value of paid insurance premiums is taken from the reported annual premium income of insurance companies offering residential buildings insurance. Division into rented and owner-occupied dwellings is carried out using the relevant net rental income in fixed prices. The gross premium consists of the net premium, which corresponds to the indemnity insurance benefits, and the service charge. As the service charge is associated with the production process for housing services, it is to be recorded as intermediate consumption. The net premium is a transfer to the insurance companies, which then flows back again to the dwelling owner in the form of indemnity insurance benefits. Costs for maintenance repairs, which are part of intermediate consumption, are then paid using the indemnity insurance benefits.

Table 3–99 shows the significance of the individual output components.

Calculating intermediate consumption

- 3.400 The largest parameter for intermediate consumption is expenditure on dwelling maintenance. Further components include the service charge for buildings insurance and financial services (FISIM).
- 3.401 The amount of maintenance expenditure is determined using intermediate consumption ratios. The ratios are based on the results of household surveys carried out as part of continuous household budget surveys (LWR) and the results of annual statistics compiled by the Federation of German Housing Enterprises for rented dwellings in the new Federal states.
- 3.402 The LWR are annual surveys of 8 000 households, from which information about household maintenance expenditure for owner-occupied dwellings can be derived directly. Maintenance expenditure is usually only payable by dwelling owners. Tenant households do not have to bear this expenditure and can therefore not provide any information about maintenance costs in the household surveys. The LWR record 'Owner expenditure (owner-occupied or rented dwelling) on the maintenance (construction measures to maintain value) of land, buildings and owner-occupied dwellings' (SEA No 1575) and imputed rent payments for owner-occupied dwellings (SEA 042). The intermediate consumption ratios for owner-occupied dwellings are calculated by correlating expenditure on maintenance (excluding payments for maintenance reserve fund) by owner-occupier households to the imputed rent for owner-occupied households. This provides the intermediate consumption ratio, which is then smoothed out by calculating the sliding five-year averages to avoid annual fluctuations. The smoothed intermediate consumption ratios are only used up to 90%, as incorrect attributions may be possible, given the difficulty of separating intermediate consumption from consumption and/or capital formation.
- 3.403 Maintenance expenditure is calculated by multiplying the intermediate consumption ratio by the total net rent (output for owner-occupied dwellings, excluding insurance premiums and property tax B).
- 3.404 In the old Federal states, the intermediate consumption ratios derived from the LWR for owner-occupier households are also used for rented dwellings. The method is the

²⁷ The services charge contained therein is part of intermediate consumption, while net premiums are part of current transfers.

same as for owner-occupied dwellings. The calculated intermediate consumption ratios from the LWR are thus used both for owner-occupied dwellings in the old and new Federal states and for rented dwellings in the old Federal states.

- 3.405 However, the data from GdW annual statistics are used as the basis for maintenance expenditure for rented dwellings in the new Länder. The GdW annual statistics contain information about maintenance (excluding modernisation) and net rent, used as the basis for calculating intermediate consumption ratios. By contrast to the old states, where letting by private households plays a significant role, housing associations dominate the rental market in the new states.²⁸ This means the GdW data can only be used for intermediate consumption for the new states.
- 3.406 The proportional service charge for residential buildings insurance to be added to intermediate consumption, is determined in a separate calculation for the insurance sector. FISIM and the service charge are added as absolute values to the maintenance expenditure calculated using the intermediate consumption ratios (see Table 3–99).
- 3.407 No information from statistical sources about maintenance expenditure is available for garages/parking spaces. It can be assumed that intermediate consumption relating to garages is far lower than that for dwellings in terms of net rent. A separate approach was therefore selected for intermediate consumption for garage rent and a flat intermediate consumption ratio of 3% was imputed in relation to output. The intermediate consumption derived here was also added.

Calculation of gross value added

- 3.408 Gross value added is calculated by deducting intermediate consumption from output. Table 3–99 shows the individual output and intermediate consumption components before macroeconomic balancing. The macroeconomic adjustment that leads to a reduction in the calculated intermediate consumption and an increase in gross value added is discussed in Chapter 6.

Table 3–99: Output, intermediate consumption and gross value added for housing services

Year 2010 in EUR (billions)

	Total	Rented dwellings	Owner-occupied dwellings
Output.....	235.790	105.277	130.513
Net rent	216.451	97.180	119.272
Garage rent.....	7.896	2.935	4.961
Property tax B	6.824	3.187	3.636
Paid residential buildings insurance premiums	4.619	1.975	2.644
Intermediate consumption before reconciliation	57.220	24.613	32.607
Maintenance expenditure	35.606	15.909	19.697
Service charge for insurance premiums	2.305	0.986	1.319
FISIM.....	19.309	7.718	11.591
Gross value added before reconciliation	178.570	80.664	97.906

²⁸ According to the GdW data, the market share of the new Federal states (including Berlin) in all occupied rented dwellings is 51.6% in 2011 (old states, 20.2%).

The proportion of intermediate consumption before reconciliation of output is 24.3% in total for 2010, with almost two-thirds being attributable to maintenance expenditure. 75.7% of output is therefore gross value added before reconciliation.

3.18.3 Real estate activities, including housing services

3.409 The calculations for the NACE/WZ section L are carried out separately for the subclasses commercial real estate activities (3.18.1) and housing services (3.18.2). Subsequently the figures are aggregated to a section total for output, intermediate consumption and gross value added respectively. As already mentioned at the beginning of this chapter, the non-financial corporations (S.12) and general government (S.13) sectors only include economic activities related to housing services. The following Table 3–100 shows the results for output, intermediate consumption and gross value added for the entire industry section L, summarised by individual calculation step and the economic sectors once again.

Table 3–100: Derivation of national accounts results in the production approach

Section L: 'Real estate activities'
Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
Non-financial corporations and households (S.11/S.14)			
Source data	408.373	129.376	278.997
+ Data validation	-1.560	1.671	-3.231
= Sub-total.....	406.813	131.048	275.765
+ Own-account fixed capital formation	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress	-0.504	-0.259	-0.245
= National accounts figures	406.309	130.788	275.521
+ Adjustments for exhaustiveness (N types)	2.179	1.702	0.476
= Balance sheet result	408.488	132.491	275.997
+ Conceptual changes	-50.219	-52.314	2.095
= National accounts result	358.269	80.177	278.092
+ Macroeconomic balancing.....	0.000	-7.692	7.692
+ FISIM.....	0.000	19.309	-19.309
+ Research and development	0.000	0.000	0.000
= National accounts result (S.11/S.14)	358.269	91.794	266.475
Financial corporations (S.12)			
+ National accounts result (S.12)	0.960	0.190	0.770
General government (S.13)			
+ National accounts result (S.13)	1.917	1.883	0.034
Non-profit institutions serving households (S.15)			
+ National accounts result (S.15)	0.000	0.000	0.000
Total economy (S.1)			
= Published figures	361.146	93.867	267.279

3.19 Professional, scientific and technical activities (NACE Rev. 2: M)

3.410 On the production side, calculations for industry sector M are basically carried out in line with the seven industry divisions (WZ 69, WZ 70, WZ 71, WZ 72, WZ 73, WZ 74 and WZ 75) of NACE Rev. 2 and/or WZ 2008. Several industry divisions have already been combined for national accounts publishing purposes in line with WZ special breakdown A*64 in NACE Rev. 2. For the purposes of the input-output account, calculations for the individual industry divisions are also broken down further by industry group. The same calculation methods are used for all industry groups and divisions within the 'Professional, scientific and technical activities' industry sector.

Viewed across all national accounts sectors, Table 3–101 shows the results of the production approach for industry sector M and the corresponding industry divisions in 2010.

Table 3–101: Summary of the 'Professional, scientific and technical activities' publication area (NACE Rev. 2 M)

Year 2010									
Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					Share in				
			in EUR (billions)	in EUR (billions)	GVA in industry	Total GVA	GDP	GNI	in %
1	M	Professional, scientific and technical activities	249.401	109.309	140.092	100	6.0	5.4	5.3
2	MA	Professional and technical activities	182.346	80.599	101.747	72.6	4.4	3.9	3.9
3	69–70	Legal and tax advice, business consulting	125.770	54.919	70.851	50.6	3.1	2.7	2.7
4	71	Architecture and engineering activities; technical testing and analysis.....	56.576	25.680	30.896	22.1	1.3	1.2	1.2
5	MB	Research and development ..	25.526	9.334	16.192	11.6	0.7	0.6	0.6
6	MC	Other professional, scientific and technical activities	41.529	19.376	22.153	15.8	1.0	0.9	0.8
7	73	Advertising and market research	23.806	11.484	12.322	8.8	0.5	0.5	0.5
8	74–75	Professional, scientific and technical activities n.e.c., veterinary activities.....	17.723	7.892	9.831	7.0	0.4	0.4	0.4

In terms of sectors, this industry section includes general government (S.13) and non-profit institutions serving households (S.15), as well as non-financial corporations (S.11) and households (S.14). See Chapter 3.21 and/or Chapter 5.8 for details about calculations for the general government sector (S.13) for output, intermediate consumption and gross value added, and calculations for the non-profit institutions serving households sector (S.15). The published figures for all sectors (S.1) are formed by adding the respective sector national accounts data.

The following derivation of the individual national accounts indicators in the production approach for industry section M and its industry divisions relates to the integrated national accounts sectors of non-financial corporations and households (S.11/S.14).

Determining output

- 3.411 Turnover data from multiple official sources, sometimes concurrent, are available as the **source data basis** for determining **output** for all seven industry divisions and the industry groups in sector M. The annual official sources include VAT statistics (based on advance VAT returns (EVAS 73311)) and, with a longer time interval, those based on assessments (EVAS 73321), the statistical business register (EVAS 52111) and the structural survey in the service sector (SiD) (EVAS 47415).
- 3.412 Even after the service statistics (SiD) are available, the VAT statistics (advance VAT returns) remain the main data basis for determining output in industry sector M. The SiD was only established as the database for the research and development industry division (WZ 72) in the 2014 revision, with transition to this source for calculating output for the period as of 2003. Although, in comparison to the service structure survey, the VAT statistics based on assessments also include small enterprises, i.e. those with annual turnover below the (current) turnover threshold of EUR 17 500 per annum, the results of these statistics and currently also those of the statistical business register are only made available with a time lag of almost four years/three years after the end of the reporting period. Data from these two sources would therefore not be available for the original production calculations carried out every summer for the reporting year $t - 2$ years. By contrast, the VAT statistics (advance VAT returns) meet the quality criterion of time availability, as the results of this survey are basically available around 18 months after the end of the reporting period. Even though the turnover data in the VAT statistics (advance VAT returns) are used as the main source for calculating output in industry divisions WZ 69, 70, 71, 73, 74 and 75, with the turnover data in the service structure survey being used for industry division WZ 72, the results of all the other aforementioned sources are continuously observed, analysed and compared to the main source used, in order to check exhaustiveness.
- 3.413 Once the main data source to be used has been defined using the VAT statistics (advance VAT returns) and/or the service structure survey, the source data are then supplemented in the next work step as part of **data validation** with turnover results for units that lie outside the scope of the VAT statistics (advance VAT returns), either in terms of industry or definition. The most extensive data validation was carried out in 2010 in WZ 70 (implementation of holding companies with management activities from WZ 68), with a far less extensive data validation in WZ 75.
- 3.414 **Own-account fixed capital formation and changes in inventories of work in progress and finished products** (output) are then added to the turnover data calculated previously, in order to determine output in the national accounts. The relevant national accounts experts provide data broken down accordingly into industry for the calculation of changes in inventories. Own-account fixed capital formation is calculated on the basis of the service structure survey results for enterprises with an annual turnover of up to EUR 250 000. No data is directly available from these

statistics for enterprises below this annual turnover threshold. To close these data gaps, the ratio of own-account fixed capital formation to gross fixed capital formation is determined for enterprises above the threshold, and this ratio is applied to smaller enterprises below the annual turnover threshold. This estimate is based on the assumption that the ratio of own-account fixed capital formation to total gross capital formation is the same for large and small enterprises.

- 3.415 In order to ensure **exhaustiveness in line with ESA 2010**, the next work step involves further adjustments, some of which cover all the industry divisions in industry sector M (see Chapter 7 for details). For example, this applies to allowances for under-reporting of the turnover of units below the annual turnover threshold (EUR 17 500) in the VAT statistics (advance VAT returns). Allowances for turnover from illegal employment are also made in the industry divisions of industry sector M. An allowance for exhaustiveness is also made in the research and development industry sector (WZ 72), based on an employment reconciliation with the employment account in national accounts and with notaries (WZ 69.10.3) – as a special case – for land transfer tax. Land transfer tax is incorporated into capital formation in construction as part of capital expenditure. It should therefore also be taken into account in product supplies (in terms of production). This is done with an explicit allowance added to output (and taxes on products) in the notary industry sector. This method is neutralised for the industry sector once again upon transition to basic prices as part of conceptual changes.
- 3.416 Once the aforementioned adjustments for exhaustiveness have been added to output calculations, this provides the output for the individual industry divisions of industry sector M in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts, e.g. adjustment of the allowance for land transfer tax, and recording the net value of goods bought for resale. Own-account research and development is also to be taken into account for the non-financial corporations sector (see Chapter 5.10.4 for more details about research and development calculations).

The following table shows the individual work steps for determining output for the seven industry divisions in industry sector M for the integrated sectors of non-financial corporations and households (S.11/S.14) once again.

Table 3–102: Derivation of output by industry division
Section M: 'Professional, scientific and technical services'
Year 2010 in EUR (billions)

List	WZ 69	WZ 70	WZ 71	WZ 72	WZ 73	WZ 74	WZ 75	Sec. M
Non-financial corporations and households (S.11/S.14)								
Source data	41.574	70.687	53.400	10.089	28.399	7.883	2.666	214.698
+ Data validation	0.000	15.370	0.000	0.000	0.000	0.000	0.013	15.383
= Sub-total.....	41.574	86.057	53.400	10.089	28.399	7.883	2.679	230.081
+ Own-account fixed capital formation ...	0.003	0.015	0.040	0.003	0.001	0.001	0.001	0.064
+ Changes in inventories of finished products and work in progress	0.010	-0.006	2.776	0.125	0.008	-0.001	0.000	2.912
= National accounts figures	41.587	86.067	56.216	10.217	28.408	7.883	2.680	233.057
+ Adjustments for exhaustiveness (N types)	6.009	0.565	0.668	0.669	0.325	7.201	0.113	15.550
= Balance sheet result	47.596	86.632	56.884	10.886	28.733	15.084	2.793	248.608
+ Conceptual changes	-5.258	-3.200	-0.481	-0.288	-4.927	-0.166	0.001	-14.319
= National accounts result	42.338	83.432	56.403	10.598	23.806	14.918	2.794	234.289
+ Macroeconomic balancing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
+ FISIM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
+ Research and development.....	0.000	0.000	0.173	1.107	0.000	0.011	0.000	1.291
= Output (S.11/S.14).....	42.338	83.432	56.576	11.705	23.806	14.929	2.794	235.580
Financial corporations (S.12)								
+ Output (S.12).....	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
General government (S.13)								
+ Output (S.13).....	0.000	0.000	0.000	10.028	0.000	0.000	0.000	10.028
Non-profit institutions serving households (S.15)								
+ Output (S.15).....	0.000	0.000	0.000	3.793	0.000	0.000	0.000	3.793
Total economy (S.1)								
= Published figures	42.338	83.432	56.576	25.526	23.806	14.929	2.794	249.401

Determining intermediate consumption

- 3.417 The calculation of **intermediate consumption** for all seven industry divisions in industry sector M for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output. The main source of data is the annual results of the service structure survey (SiD).
- 3.418 Corresponding expenditure is determined during **data validation** using the same method as for determining output. The national accounts figures for intermediate consumption are compiled by adding the source data and data validation, plus

corresponding intermediate consumption for own-account fixed capital formation and changes in inventories of work in progress and finished products. In accounts terms, reported intermediate consumption also includes own-account fixed capital formation and changes in inventories of work in progress and finished products, as shown in the table.

- 3.419 Intermediate consumption for **further adjustments for exhaustiveness** in line with ESA 2010 is basically determined using the respective industry-specific intermediate consumption ratio (calculated as a percentage ratio of intermediate consumption to output). Only half the corresponding intermediate consumption ratio is used for the allowance for illegal employment per industry sector, given the lack of precise information.
- 3.420 Once the ESA 2010-compliant changes have been added to intermediate consumption, this provides the intermediate consumption for each of the seven industry divisions in industry sector at business accounts level. In order to transpose the data into national accounts concepts, these results are then modified to include the conceptual changes, macroeconomic adjustments (see Chapter 6), FISIM (see Chapter 3.17) and purchased research and development (does not apply to WZ 72) (see Chapter 5.10).

Table 3–103 shows a summary of the individual intermediate consumption calculation phases for industry sector M once again for the integrated non-financial corporations and households sectors (S.11/S.14).

Table 3–103: Derivation of intermediate consumption by industry division

Section M: 'Professional, scientific and technical services'

Year 2010 in EUR (billions)

List	WZ 69	WZ 70	WZ 71	WZ 72	WZ 73	WZ 74	WZ 75	Sec. M
Non-financial corporations and households (S.11/S.14)								
Source data	11.065	37.489	25.828	5.272	16.620	3.704	1.135	101.113
+ Data validation	0.000	9.038	0.000	0.000	0.000	0.000	0.006	9.044
= Sub-total.....	11.065	46.527	25.828	5.272	16.620	3.704	1.141	110.157
+ Own-account fixed capital formation ...	0.001	0.009	0.019	0.001	0.001	0.000	0.000	0.031
+ Changes in inventories of finished products and work in progress	0.003	-0.003	1.380	0.065	0.003	0.000	0.000	1.448
= National accounts figures	11.068	46.533	27.227	5.338	16.624	3.704	1.141	111.635
+ Adjustments for exhaustiveness (N types)	1.488	0.157	0.187	0.308	0.112	3.352	0.024	5.628
= Balance sheet result	12.556	46.690	27.414	5.646	16.736	7.056	1.165	117.263
+ Conceptual changes	-0.147	-3.403	-0.218	-0.402	-5.086	-0.252	-0.009	-9.517
= National accounts result	12.409	43.287	27.196	5.244	11.650	6.804	1.156	107.746
+ Macroeconomic balancing	-0.826	-1.108	-0.806	-0.148	-0.335	-0.224	-0.045	-3.492
+ FISIM	0.639	0.518	0.518	0.073	0.169	0.164	0.052	2.133
+ Research and development.....	0.000	0.000	-1.228	0.000	0.000	-0.015	0.000	-1.243
= Intermediate consumption (S.11/S.14).....	12.222	42.697	25.680	5.169	11.484	6.729	1.163	105.144
Financial corporations (S.12)								
+ Intermediate consumption (S.12)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
General government (S.13)								
+ Intermediate consumption (S.13)	0.000	0.000	0.000	3.442	0.000	0.000	0.000	3.442
Non-profit institutions serving households (S.15)								
+ Intermediate consumption (S.15)	0.000	0.000	0.000	0.723	0.000	0.000	0.000	0.723
Total economy (S.1)								
= Published figures	12.222	42.697	25.680	9.334	11.484	6.729	1.163	109.309

Deriving gross value added

3.421 Gross value added for the individual industry sectors of industry sector M is calculated by subtracting intermediate consumption from output (subtraction method) for the integrated non-financial corporations and households sectors (S.11/S.14).

The following table shows the results for output, intermediate consumption and gross value added, summarised by individual calculation step for industry sector M and all sectors once again.

Table 3–104: Derivation of national accounts results in the production approach
Section M: 'Professional, scientific and technical services'
Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
	Non-financial corporations and households (S.11/S.14)		
Source data	214.698	101.113	113.585
+ Data validation	15.383	9.044	6.339
= Sub-total	230.081	110.157	119.924
+ Own-account fixed capital formation	0.064	0.031	0.033
+ Changes in inventories of finished products and work in progress	2.912	1.448	1.464
= National accounts figures	233.057	111.635	121.422
+ Adjustments for exhaustiveness (N types)	15.550	5.628	9.922
= Balance sheet result	248.608	117.263	131.345
+ Conceptual changes	-14.319	-9.517	-4.802
= National accounts result	234.289	107.746	126.543
+ Macroeconomic balancing	0.000	-3.492	3.492
+ FISIM	0.000	2.133	-2.133
+ Research and development	1.291	-1.243	2.534
= National accounts result (S.11/S.14)	235.580	105.144	130.436
	Financial corporations (S.12)		
+ National accounts result (S.12)	0.000	0.000	0.000
	General government (S.13)		
+ National accounts result (S.13)	10.028	3.442	6.586
	Non-profit institutions serving households (S.15)		
+ National accounts result (S.15)	3.793	0.723	3.070
	Total economy (S.1)		
= Published figures	249.401	109.309	140.092

3.20 Administrative and support service activities (NACE Rev. 2: N)

3.422 On the production side, this industry section is basically published in line with industry divisions WZ 77, WZ 78, WZ 79 and WZ 80, WZ 81 and WZ 82 (aggregated) of NACE Rev. 2 and/or WZ 2008; calculations themselves are carried out in more detail. Various calculation methods are used for the industry divisions of industry section N, depending on the source data.

Table 3–105: Summary of the 'Administrative and support service activities' publication area (NACE Rev. 2: N)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					Share in				
			in EUR (billions)	in EUR (billions)	GVA in industry	Total GVA	GDP	GNI	
					in %				
1	N	Administrative and support service activities	178.389	72.149	106.240	100	4.6	4.1	4.0
2	77	Rental and leasing activities	58.863	18.102	40.761	38.4	1.8	1.6	1.5
3	78	Employment activities	29.089	8.083	21.006	19.8	0.9	0.8	0.8
4	79	Travel agencies and tour operators	23.488	17.091	6.397	6.0	0.3	0.2	0.2
5	80-82	Administrative and support service activities n.e.c.	66.949	28.873	38.076	35.8	1.6	1.5	1.4

In terms of sectors, the non-financial corporations (S.11) and households (S.14) sectors are represented in this industry section. The published figures for these integrated sectors correspond to the result for all sectors (S.1).

Determining output

- 3.423 Turnover data from multiple official sources, sometimes concurrent, are available as the **source data basis** for determining **output** for all six industry divisions in sector N. The annual official sources include VAT statistics (based on advance VAT returns (EVAS 73311) and, with a longer time interval, those based on assessments (EVAS 73321)), the statistical business register (EVAS 52111) and the structural survey in the service sector (SiD) (EVAS 47415).
- 3.424 By weighing up the quality criteria such as exhaustiveness, accuracy and time availability, the VAT statistics (advance VAT returns) were selected as the main source of statistics for the industry divisions 'Rental and leasing activities' (WZ 77), 'Security and investigation activities' (WZ 80) and 'Services to buildings and landscape

activities' (WZ 81); the service structure survey (SiD) was selected as the main source of statistics for the divisions 'Employment activities' (WZ 78), 'Travel agency, tour operator reservation service and related activities' (WZ 79) and 'Office administrative, office support and other business support activities n.e.c.' (WZ 82). The service structure survey was selected as the basis for determining output for the three latter industry divisions because it offers more exhaustive coverage in these divisions than the VAT statistics (advance VAT returns). The aim when selecting statistical sources is always to ensure maximum calculation exhaustiveness.

- 3.425 Although, in comparison to the VAT statistics based on advance VAT returns and the service structure survey, the VAT statistics based on assessments also include small enterprises, i.e. those with annual turnover below the (current) turnover threshold of EUR 17 500 per annum, the results of these statistics and currently also those of the statistical business register are only made available with a time lag of almost four years/three years after the end of the reporting period. Data from these two sources would therefore not be available for the original production calculations carried out every summer for the reporting year $t - 2$ years. By contrast, the VAT statistics (advance VAT returns) and the service structure survey meet the quality criterion of time availability, as the results of these statistics are basically available around 18 months after the end of the reporting period. The results for small enterprises from annual VAT assessment statistics can nevertheless still be used in output calculations to ensure exhaustiveness, in a later work phase described below.
- 3.426 Even though the turnover data in the VAT statistics (advance VAT returns) are used as the main source for calculating output for some industry divisions and the service structure survey is used as the main source for calculating output for the other divisions in industry sector N, the results of all the other aforementioned sources for each industry division are continuously observed, analysed and compared to the main source used, in order to check exhaustiveness.
- 3.427 Once the main data source to be used has been defined using the VAT statistics (advance VAT returns) and/or the service structure survey, the source data are then supplemented in the next work step as part of **data validation** with turnover results for units that lie outside the scope of the corresponding source statistics, either in terms of industry or definition. The survey results are also adjusted to take account of incorrect attributions to economic sectors. These types of data validation are usually carried out at micro level and in close cooperation with the specialised service and/or VAT statisticians.
- 3.428 Adjustments had to be made in 2010 to take account of the incorrect attribution of the Musical Performance and Mechanical Reproduction Rights Society (GEMA) within the scope of the VAT statistics and the service structure survey, in relation to the industry division 'Rental and leasing activities' (WZ 77). This unit was incorrectly included in industry division 77, but, given its industry activity features, it should belong to the industry division for motion picture, video and television programme production (WZ 59). The corresponding annual report is used as the database for this validation (see counter-entry in section 3.16 Information and communication).
- 3.429 Own-account fixed capital formation and changes in inventories of work in progress and finished products (output) are then added to the turnover data calculated previously, in order to determine output in the national accounts. The relevant national accounts experts provide data broken down accordingly into industry for the latter indicator to calculate changes in inventories. Own-account fixed capital formation is calculated on the basis of the service structure survey results for enterprises with an annual turnover of up to EUR 250 000. No data is directly available from these statistics for enterprises below this annual turnover threshold. These data gaps are closed via reconciliation with national accounts calculations for capital formation, as

the percentage relation of major corporations (the percentage ratio of own-account fixed capital formation for business purposes to gross capital formation for corporations with a turnover of EUR 250 000 or more) for each industry division in industry sector N is based on the gross fixed capital formation of all corporations. It is therefore implicitly assumed that the own-account fixed capital formation of corporations with a turnover below the annual threshold of EUR 250 000 have the same percentage shares in gross capital formation as major corporations.

- 3.430 In order to ensure **exhaustiveness in line with ESA 2010**, the next work step involves further adjustments, some of which cover all the industry divisions in sector N (see Chapter 7 for details). For example, this applies to allowances for under-reporting of the turnover of units below the annual turnover threshold (EUR 17 500) in the VAT statistics (advance VAT returns) and/or the service structure survey. The turnover of small enterprises as listed in VAT statistics is used as the data basis for calculating this allowance for exhaustiveness, based on assessments that are normally available four years after the end of the reporting year. Economic activity-specific allowance factors are generated for each industry division relating to administrative and support service activities, using the percentage ratio of small enterprise turnover to all turnover in the assessment statistics, in order to estimate the corresponding turnover results from the relevant source statistics. Allowances for turnover from illegal employment are also made in the industry divisions of industry sector N. This is basically carried out using a model based on the findings of the Financial Monitoring Unit to combat illicit employment, reporting to the Federal Ministry of Finance (customs officers) A valuation adjustment is also carried out for a mark-up in relation to own-account fixed capital formation in this division.
- 3.431 Furthermore, economic activity-specific adjustments are carried out in relation to leasing to ensure exhaustiveness in the 'Rental and leasing activities' industry division (WZ 77). These are allowances for affiliated leasing and corporations that run equipment and/or real estate leasing businesses but that are classified in the business register and/or VAT statistics under WZ 64.91 (Financial leasing), not WZ 77. The latter adjustment for exhaustiveness was the result of an investigation order by the 'Coherence' internal national accounts working group. Together with national accounts banking and insurance experts and the financial corporations sector (S.12), each unit in WZ 64.91 in the business register was investigated individually to check if it belonged to the banking and insurance industry sector and/or sector S.12. At the same time, research was carried out to check the main type of leasing (equipment or real estate) carried out by these units and/or whether these units were to be classified as affiliated or unaffiliated leasing corporations. As a result of these extensive investigations, it was established that all the units in WZ 64.91 belong to the non-financial corporations sector (S.11) and are unaffiliated leasing corporations; most of these units (90%) focus on equipment leasing, with 10% focusing on real estate leasing. In line with these findings, 90% of turnover data from WZ 64.91 are therefore added to the VAT statistics for WZ 77 and the remaining 10% are recorded in industry sector L, as part of adjustments for exhaustiveness.
- 3.432 A corresponding allowance is made for turnover from affiliated leasing on the basis of annual information provided by the individual affiliated leasing corporations. This allowance is necessary, as the majority of affiliated leasing corporations are integrated subsidiaries within a group/tax group. Since the VAT statistics treat the group or principal enterprise as the sole taxable entity, and since the main activity of such groups is often manufacturing, the turnover data for the leasing enterprises would be 'lost' if only the VAT statistics pertaining to this sector were consulted. As the data referring to manufacturing output are drawn from the relevant specialised statistics rather than the VAT statistics, and the specialised statistics state the 'sector' turnover rather than that of the group, they are not taken into account either. A corresponding

adjustment for exhaustiveness is therefore carried out in WZ 77, in order to counteract an under-reporting gap in national accounts in terms of affiliated leasing in the production approach

- 3.433 Once the aforementioned adjustments for exhaustiveness have been added to output calculations, this provides the output for the individual industry divisions of industry sector N in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts, e.g. recording the net value of goods bought for resale. **Own-account research and development** is also to be taken into account for the non-financial corporations sector in terms of further ESA-compliant implementation (see Chapter 5.10.4 for more details about research and development calculations). However, own-account research and development is of lesser importance in industry sector N.

The following table shows the individual work steps for determining output for the six industry divisions in sector N for the integrated sectors of non-financial corporations and households (S.11/S.14) once again.

Table 3–106: Derivation of output by industry division

Sector N: 'Administrative and support service activities'

Year 2010 in EUR (billions)

List	WZ 77	WZ 78	WZ 79	WZ 80	WZ 81	WZ 82	Sec. N
Non-financial corporations and households (S.11/S.14)							
Source data	38.319	29.238	23.483	5.030	23.175	35.750	154.995
+ Data validation	-0.857	0.000	0.000	0.000	0.000	0.000	-0.857
= Sub-total.....	37.462	29.238	23.483	5.030	23.175	35.750	154.138
+ Own-account fixed capital formation.....	0.078	0.007	0.012	0.001	0.005	0.133	0.237
+ Changes in inventories of finished products and work in progress	0.023	0.014	0.009	-0.001	0.058	0.065	0.168
= National accounts figures	37.563	29.260	23.504	5.030	23.238	35.949	154.543
+ Adjustments for exhaustiveness (N types)	26.701	0.956	0.171	0.614	3.095	0.390	31.926
= Balance sheet result	64.263	30.215	23.675	5.644	26.333	36.339	186.469
+ Conceptual changes	-5.404	-1.126	-0.187	-0.295	-0.315	-0.757	-8.084
= National accounts result	58.859	29.089	23.488	5.349	26.018	35.582	178.385
+ Macroeconomic balancing	0.000	0.000	0.000	0.000	0.000	0.000	0.000
+ FISIM	0.000	0.000	0.000	0.000	0.000	0.000	0.000
+ Research and development.....	0.004	0.000	0.000	0.000	0.000	0.000	0.004
= Output (S.11/S.14)	58.863	29.089	23.488	5.349	26.018	35.582	178.389
Financial corporations (S.12)							
+ Output (S.12)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
General government (S.13)							
+ Output (S.13)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Non-profit institutions serving households (S.15)							
+ Output (S.15)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total economy (S.1)							
= Published figures	58.863	29.089	23.488	5.349	26.018	35.582	178.389

Determining intermediate consumption

- 3.434 The calculation of **intermediate consumption** for all six industry divisions in industry sector N for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output.
- 3.435 The main source of data for calculating economic activity-specific intermediate consumption ratios is the annual results of the service structure survey. Information from annual reports and association publications is also available for some sectors.
- 3.436 Corresponding expenditure is determined during **data validation** using the same method as for determining output. The national accounts figures for intermediate

consumption are compiled by adding the source data and data validation. In pure accounts terms, reported intermediate consumption also includes own-account fixed capital formation and changes in inventories of work in progress and finished products, as shown in the table.

- 3.437 Intermediate consumption for further **adjustments for exhaustiveness** in line with ESA 2010 is basically determined using the respective industry-specific intermediate consumption ratio (calculated as a percentage ratio of intermediate consumption to output). Only half the corresponding intermediate consumption ratio is used for the allowance for illegal employment per industry division, given the lack of precise information.
- 3.438 Once the **conceptual changes** have been added to intermediate consumption, this provides the intermediate consumption for each industry division in line with national accounts concepts. In order to transpose the data into published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10).

Table 3–107 shows a summary of the individual intermediate consumption calculation phases for the integrated sectors for industry sector N once again.

Table 3–107: Derivation of intermediate consumption by industry division

Sector N: 'Administrative and support service activities'

Year 2010 in EUR (billions)

List	WZ 77	WZ 78	WZ 79	WZ 80	WZ 81	WZ 82	Sec. N
Non-financial corporations and households (S.11/S.14)							
Source data	13.923	9.487	17.210	1.303	7.626	21.022	70.571
+ Data validation	-0.051	0.000	0.000	0.000	0.000	0.000	-0.051
= Sub-total.....	13.872	9.487	17.210	1.303	7.626	21.022	70.520
+ Own-account fixed capital formation.....	0.026	0.002	0.009	0.000	0.002	0.078	0.119
+ Changes in inventories of finished products and work in progress	0.007	0.003	0.008	0.000	0.024	0.039	0.081
= National accounts figures	13.906	9.492	17.227	1.303	7.653	21.138	70.719
+ Adjustments for exhaustiveness (N types)	10.433	0.210	0.084	0.087	0.700	0.135	11.649
= Balance sheet result	24.339	9.702	17.311	1.390	8.352	21.273	82.367
+ Conceptual changes	-5.529	-1.221	-0.186	-0.305	-0.347	-0.964	-8.552
= National accounts result	18.810	8.481	17.125	1.085	8.005	20.309	73.815
+ Macroeconomic balancing	-1.105	-0.569	-0.176	-0.118	-0.497	-0.421	-2.886
+ FISIM	0.397	0.171	0.142	0.036	0.247	0.227	1.220
+ Research and development.....	0.000	0.000	0.000	0.000	0.000	0.000	0.000
= Intermediate consumption (S.11/S.14)	18.102	8.083	17.091	1.003	7.755	20.115	72.149
Financial corporations (S.12)							
+ Intermediate consumption (S.12)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
General government (S.13)							
+ Intermediate consumption (S.13)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Non-profit institutions serving households (S.15)							
+ Intermediate consumption (S.15)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total economy (S.1)							
= Published figures	18.102	8.083	17.091	1.003	7.755	20.115	72.149

Deriving gross value added

3.439 Gross value added for the individual industry divisions of industry sector N is calculated by subtracting intermediate consumption from output (subtraction method) for the integrated non-financial corporations and households sectors (S.11/S.14).

The following table shows the results for output, intermediate consumption and gross value added, summarised by individual calculation step for industry sector N and all sectors once again.

Table 3–108: Derivation of national accounts results in the production approach
Sector N: 'Administrative and support service activities'
Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
	Non-financial corporations and households (S.11/S.14)		
Source data	154.995	70.571	84.424
+ Data validation	-0.857	-0.051	-0.805
= Sub-total	154.138	70.520	83.619
+ Own-account fixed capital formation	0.237	0.119	0.119
+ Changes in inventories of finished products and work in progress	0.168	0.081	0.087
= National accounts figures	154.543	70.719	83.825
+ Adjustments for exhaustiveness (N types)	31.926	11.649	20.277
= Balance sheet result	186.469	82.367	104.102
+ Conceptual changes	-8.084	-8.552	0.468
= National accounts result	178.385	73.815	104.570
+ Macroeconomic balancing	0.000	-2.886	2.886
+ FISIM	0.000	1.220	-1.220
+ Research and development	0.004	0.000	0.004
= National accounts result (S.11/S.14)	178.389	72.149	106.240
	Financial corporations (S.12)		
+ National accounts result (S.12)	0.000	0.000	0.000
	General government (S.13)		
+ National accounts result (S.13)	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)		
+ National accounts result (S.15)	0.000	0.000	0.000
	Total economy (S.1)		
= Published figures	178.389	72.149	106.240

3.21 Public administration and defence; compulsory social security (NACE Rev. 2: O)

3.440 Gross value added (GVA) for the 'public administration and defence; compulsory social security' section is calculated annually at two-digit heading level (divisions) in line with WZ 2008 and/or NACE Rev. 2 and published in line with WZ special breakdown A*64 in ESA 2010 (Table 3–109):

Table 3–109: Summary of the 'Public administration and defence; compulsory social security' publication area (NACE Rev. 2 O)

Year 2010									
Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					Share in				
			in EUR (billions)		in EUR (billions)		GVA in industry	Total GVA	GDP
1	O	Public administration and defence; compulsory social security	220.903	74.185	146.718	100	6.3	5.7	5.6

In terms of sectors, this industry section includes general government (S.13). The published figures for this sector correspond to the result for all sectors (S.1).

3.441 This section begins with the description of the calculation method for the output of the entire general government sector (S.13), since the assessment bases and methods are very similar and can be examined without reference to specific economic activity as classified in the German classification of economic activities. The results are then assigned to various domains of economic activity and collated with the results from other sectors of the economy.

3.442 The delimitation of the general government sector was considerably modified in the last two major revisions (2011, 2014). In particular, extra budgets (state-supported universities, funds, establishments and enterprises) that had previously been outsourced by national, regional and local authorities were reintegrated into the general government sector by the 2011 major revision. In the 2014 major revision, non-profit institutions serving households (research bodies) were reclassified as being part of the general government sector in line with ESA 2010 Paragraph 2.112. According to this, a unit is allocated to the general government sector if it fulfils the following ESA 2010 criteria:

- Institutional unit? (Paragraph 2.12 of ESA 2010)
- Public control? (Paragraphs 2.38 and 2.39 of ESA 2010)
- Test for market/non-market production (so-called tightened 50% criterion, which should now also include interest payable and receivable) (Paragraph 3.33 of ESA 2010)

3.443 The general government sector therefore consists of all institutional public units that mainly carry out non-market production. However, it is quite possible that the

institutional units integrated into the general government sector could also include elements (so-called local kind-of-activity units) that carry out market production. In the case of institutional public units that are non-market producers, the primary local kind-of-activity unit is always a non-market producer. However, the secondary local kind-of-activity unit can also be a market producer.

- 3.444 All core and extra budgetary units belonging to the general government sector are incorporated into reporting units' management system for public finance statistics (BKM, EVAS 75111), a register for all public units in Germany.
- 3.445 When calculating general government output, the accounting results of the accounting results of the core budgets, of the extra budgets using cameralistic/double²⁹-entry accounting and of other public funds, institutions and enterprises using cameralistic/double entry accounting of the Federation (incl. EU shares), the Länder and social insurance (EVAS 71712) are available as data sources for the Federal, state and social security sub-sectors. Moreover, for the social security sub-sector data are broken down by the branches of social insurance (pension insurance scheme, agricultural pension funds, statutory health insurance, statutory long-term care insurance schemes, statutory accident insurance and unemployment insurance schemes) are also included. The accounting results of the core budgets, of the extra budgets using cameralistic/double-entry accounting and of the other public funds, institutions and enterprises using cameralistic/double-entry accounting of the municipalities/associations of municipalities (EVAS 71717) are used for the local government sub-sector.
- 3.446 The following data sources are also included in accounting:
- Annual higher education finance statistics (EVAS 21371), in case the extra budgetary unit is a university;
 - The survey of expenditure, receipts and staff of public and state-subsidized institutions for science and research (EVAS 21811), in case the extra budgetary unit is a research institution.
- 3.447 The recording of an extra budgetary unit in BKM as part of the general government sector is also directly relevant for the precise determination of general government delimitation in data surveys. The BKM and statistical sources are used to ensure that all public budgets in Germany are recorded exhaustively.
- 3.448 Due to the prescribed budget and accounting systems, the statistical sources not only provide data on the economic categories to which the public institutions' revenue and expenditure belong, but also serve as a basis for differentiation by local kind-of-activity unit (KAU) by means of functional classification. Although data relating to individual local KAUs of a particular local authority, for example, are not recorded, it is possible to obtain information such as the total revenue and expenditure of all local authority units with the same responsibilities (e.g. local water supply company). Analysis of the source statistics has shown that local KAUs can be identified in 14

²⁹ Single-entry accounting is an accounting method primarily used in public administration. Single-entry accounting is a method of monetary and financial accounting that focuses on liquidity or the so-called monetary consumption concept (Geldverbrauchs-konzept). Single-entry accounting records all revenues and expenditure in the relevant budget year that have a cash effect. Double-entry accounting in public administration means an accounting system that follows the principles of commercial accounting in line with the German Commercial Code, but that is adapted to the functions of the state budget. The double-entry-based budget covers accounting for the profit plan (profit and loss account), financial plan (financial statements) and wealth accounting (balance sheets).

areas of economic activity in the general government sector; these KAUs may be assigned to either the category of market production or that of non-market production (including non-market production for own final use), depending on the area of economic activity in which they operate. Allocation is carried out using the 50%-criterion, where local KAUs are to be classified as market producers if more than 50% of their production costs (including net capital costs) are covered by turnover (Paragraphs 20.29. et seq. of ESA 2010). Otherwise, the local KAUs are to be considered as non-market producers.

3.449 Applying the aforementioned classification rules, the general government sector can be presented in the following subdivision by industry division and by market or non-market :

Table 3–110: Market and non-market production in the general government sector in 2010

WZ 2008	Industry	Output EUR (billion)	Federal government, Länder (State governments)	Local governments	Social security
01	Agriculture, hunting and related activities ...	0.057	MP		
02	Forestry and logging.....	0.370	MP	MP	
36	Water supply.....	0.723		MP	
37-39	Sewerage, waste management; material recovery and remediation activities.....	7.624		MP	
52	Warehousing and support activities for transportation.....	3.477	NMP	MP, NMP	
68	Real estate activities.....	1.917	MP	MP	
72	Scientific research and development	10.028	NMP	NMP	
84	Public administration and defence; compulsory social security.....	220.903	NMP	NMP	NMP
85	Education	106.130	NMP	NMP	
86	Human health activities	3.745	NMP	MP	
87-88	Care homes and social work activities.....	3.263	NMP	NMP	
90-92	Art and culture; gambling.....	10.091	NMP	NMP	
93	Sport activities and amusement and recreation activities	4.095	NMP	NMP	
96	Other personal service activities	0.741		MP	
	Total for general government sector	373.164			

MP = market production; NMP = non-market production

a) Non-market production by general government

3.450 Non-market production is carried out within the economic sector 'Public administration' (general government sector only). This means that the output of these government KAUs with non-market production is calculated by adding together the compensation of employees, taxes on production paid (less other subsidies received),

consumption of fixed capital and intermediate consumption. Output includes non-market production by these units for their own final use.

Table 3–111: Non-market production in the general government sector

Year 2010 in EUR (billions)

	Public administration sector	Other industries	General government sector
Compensation of employees.....	119.238	81.695	200.933
+ Other taxes on production.....	0.050	0.000	0.050
– Other subsidies.....	0.693	0.080	0.773
+ Consumption of fixed capital	28.123	22.429	50.552
= Gross value added	146.718	104.044	250.762
+ Intermediate consumption	74.185	34.872	109.057
= Output	220.903	138.916	359.819

- 3.451 **Compensation of employees** covers the salaries of civil servants, the salaries of employees, emoluments for professional soldiers, service pay for conscripts in the armed forces and payments made to conscripts performing alternative non-military service, including expenditure on conscripts' food and accommodation. Besides the actual social contributions payable by employers and employees, compensation of employees also includes social contributions which may be imputed on grounds of comparability for established civil servants' superannuation, for invalidity benefits and for income support. In the calculation of the imputed social contributions to superannuation schemes for civil servants in federal state and local governments, as well as the benefits payable by these government sub-sectors to superannuation recipients, a percentage of the civil servants' pay (2010: 33.7%) is used as the assessment basis. The method for determining imputed social contributions to superannuation schemes was revised significantly for the 2014 major revision. A modified method is now used, instead of the previous composition of the allowance rate with a rate of contribution payable to statutory pension insurance and a constant allowance of 7% as the cost equivalent for benefits payable to superannuation recipients and contributions to the Versorgungsanstalt des Bundes und der Länder (VBL). This is based on the actual benefits paid out and/or the actual rate of contribution to the Versorgungsanstalt des Bundes und der Länder. As before, the modified allowance rate is determined from the rate of contribution payable to statutory pension insurance plus the average rate of contribution payable to the Versorgungsanstalt des Bundes und der Länder, plus a factor calculated as the ratio of the benefits paid to pensioners to total civil servant compensation. As figures have risen significantly for the last two indicators in the past, the allowance rate has therefore also increased significantly in comparison to the previous method, from 26.9% to 33.7% in 2010. Social contributions for employees of social insurance institutions correspond to the actual monetary cost of social benefits for these persons.
- 3.452 With regard to the **other taxes on production** paid by the general government, it should be noted that the tax liability of governments is limited under German fiscal law. The other taxes on production that are paid by the general government consist only of property tax (payable on land used for residential and commercial purposes, including

forestry) and motor vehicle tax on official vehicles (except those in exempted categories).

- 3.453 The **other subsidies** on production received by the general government are payroll grants awarded by the Federal Employment Agency to employers who recruit employees, particularly within the framework of the programme for the reintegration of the long-term unemployed. The national job-creation programme (ABM), which was still mentioned in the 2005 method report, only plays a subordinate role here now. Payroll grants are awarded to employers in all sectors on the basis of the same criteria, which means that they can be assigned to the general government sector as other subsidies on production received.
- 3.454 Calculations for the **consumption of fixed capital** by local KAUs with non-market production in the general government sector are described in section 4.12.
- 3.455 All government purchases of goods and services (including FISIM) for the regular production of non-market producer units, are recorded as **intermediate consumption**. These purchases relate to items required for official business (including office materials, books, journals and official expenditure on postage and telephone calls), consumables, rent, vehicle running costs, the management and maintenance of land and buildings, procurement of military material (other than capital goods), purchases of machinery, furnishings and equipment (other than capital goods), the cost of official travel and various services (including bank services, MPs' expenses and legal and consultancy fees). Upon the introduction of ESA 2010, own-account and purchased research and development for the general government sector (see Chapter 5.9) was no longer recorded as intermediate consumption, but as fixed capital formation, with the exception of purchased research and development for the 'Scientific research and development' economic activity, which is still recorded as intermediate consumption as it is part of the R&D production process according to convention. Furthermore, since ESA 2010 entered into force, military weapons systems have no longer been recorded as intermediate consumption, but as equipment (planes, tanks, ships) and/or inventories (ammunition, missiles, grenades or bombs) in national accounts.

b) General government market production

- 3.456 In the local market-producer KAUs within the general government sector, output is calculated on the basis of the turnover of these units. The turnover of these units includes income from user charges and, where applicable for these units, income from charges for administrative services (where the general government imposes charges for administrative services such as of inspections, etc.), income from economic activity, including rents, as well as income from concessions and licences (unless such income is derived from property (rents) or from acquisitions less disposals of non-produced assets). For 2010, the output for these units amounted to EUR 13.345 billion. After the deduction of intermediate consumption of EUR 8.992 billion, this left EUR 4.353 billion in gross value added

The following table shows the gross value added for the general government sector, integrating market and non-market production by industry.

Table 3–112: Output, intermediate consumption and gross value added in the general government sector by industry
Year 2010 in EUR (billions)

WZ 2008	Industry	Output	Intermediate consumption	Gross value added
01	Agriculture, hunting and related activities	0.057	0.361	– 0.304
02	Forestry and logging	0.370	0.163	0.207
36	Water supply	0.723	0.293	0.430
37-39	Sewerage, waste management; and remediation activities	7.624	4.605	3.019
52	Warehousing and support activities for transportation	3.477	1.308	2.169
68	Real estate activities	1.917	1.883	0.034
72	Scientific research and development	10.028	3.442	6.586
84	Public administration and defence; compulsory social security	220.903	74.185	146.718
85	Education	106.13	21.934	84.196
86	Human health activities	3.745	2.483	1.262
87-88	Care homes and social work activities	3.263	1.175	2.088
90-92	Art and culture; gambling	10.091	4.197	5.894
93	Sport activities and amusement and recreation activities	4.095	1.678	2.417
96	Other personal service activities	0.741	0.342	0.399
	Total for general government sector	373.164	118.049	255.115

3.22 Education (NACE Rev. 2: P)

3.457 Differentiation was further expanded in industry section P 'Education' in NACE Rev. 2 in comparison to the previous classification it replaced, NACE Rev. 1.1. The sector now also includes sports and leisure education activities, as well as support services for education.

Industry section P corresponds to the education industry division (WZ 85) in accordance with NACE Rev. 2 and/or WZ 2008, as this sector only covers one industry division. National accounts results are published in line with the special national accounts breakdown A*64 in NACE Rev. 2 for industry sector P. For the purposes of the input-output account and given the source data, calculations are also broken down further by industry group. The same calculation methods are used for all industry groups in the 'Education' industry sector.

Viewed across all national accounts sectors, Table 3–113 shows the results of the production approach for industry sector P (WZ 85) in 2010.

Table 3–113: Summary of the 'Education' publication area (NACE Rev. 2 P)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					Share in				
			in EUR (billions)	in EUR (billions)	GVA in industry	Total GVA	GDP	GNI	in %
1	P	Education	132.623	28.956	103.667	100	4.5	4.0	3.9

In terms of sectors, this industry section particularly includes general government (S.13) and non-profit institutions serving households (S.15), as well as non-financial corporations (S.11) and households (S.14). The majority of economic services are carried out by general government institutions (S.13). See Chapter 3.21 and/or Chapter 5.8 for details about calculations for the general government sector (S.13) for output, intermediate consumption and gross value added and calculations for the non-profit institutions serving households sector (S.15). The published figures for all sectors (S.1) are formed by adding the respective sector national accounts data.

The following derivation of the individual national accounts indicators in the production approach for sector P (WZ 85) relates to the integrated national accounts sectors of non-financial corporations and households (S.11/S.14).

Determining output

- 3.458 Turnover data from multiple official sources are available as the **source data basis** for determining **output** for industry sector P (WZ 85). The annual official sources include VAT statistics (based on advance VAT returns and, with a longer time interval, those based on assessments) and the statistical business register (EVAS 52111).
- 3.459 By weighing up the criterion of time availability, the VAT statistics (advance VAT returns) (EVAS 73311) were selected as the main source of statistics to be used to calculate output for industry sector P.
- 3.460 In comparison to the VAT statistics based on advance VAT returns, the VAT statistics based on assessments also include small enterprises, i.e. those with annual turnover below the (current) turnover threshold of EUR 17 500 per annum. However, the results of these statistics and currently also those of the statistical business register are only made available with a time lag of almost four years/three years after the end of the reporting period. Data from these two sources would therefore not be available for the original production calculations carried out every summer for the reporting year $t - 2$ years. By contrast, the VAT statistics (advance VAT returns) meet the quality criterion of time availability, as the results of this survey are basically available around 18 months after the end of the reporting period. The results for small enterprises from annual VAT statistics (assessments) (EVAS 73321) can nevertheless still be used in output calculations to ensure exhaustiveness, in a later work phase described below.

Even though the turnover data in the VAT statistics (advance VAT returns) are used as the main source for calculating output in industry sector P (WZ 85), the results of all the other aforementioned sources are continuously observed, analysed and compared to the main source used, in order to check exhaustiveness.

- 3.461 Once the main data source to be used has been defined using the VAT statistics (advance VAT returns), the source data are then supplemented in the next work step as part of **data validation** with turnover results for units that lie outside the scope of the VAT statistics (advance VAT returns) either in terms of industry or definition. No data validation was carried out in 2010 for industry sector P.
- 3.462 Own-account fixed capital formation is then added to the turnover data previously calculated in order to determine output in the national accounts. These data were determined on the basis of the results of earlier voluntary cost structure statistics. There are no changes in inventories of work in progress and finished products in this industry sector.
- 3.463 In order to ensure **exhaustiveness in line with ESA 2010**, the next work step involves further adjustments, some of which cover all the industry groups in sector P and some of which only cover some of those groups. Affecting all industry groups, these are under-reporting allowances for turnover for units below the annual turnover threshold (EUR 17 500) for VAT statistics based on advance VAT returns (see Chapter 7 for details). The turnover of small enterprises as listed in VAT statistics is used as the data basis for calculating this allowance for exhaustiveness, based on assessments that are normally available four years after the end of the reporting year. Economic activity-specific allowance factors are generated for each industry group in the education sector, using the percentage ratio of small enterprise turnover to all turnovers in the assessment statistics, in order to estimate the corresponding turnover results from the VAT statistics based on advance VAT returns. Specific allowances for exhaustiveness are also carried out for individual industry groups. In industry group 85.5 (Other education services), these are allowances for freelance trainers, as well as allowances for VAT-exempt services in 85.5 and 85.6 (Educational support services). Amongst other things, these industry groups include sports, leisure and cultural education. Within the framework of the consistency check on the results of the production approach in comparison to the employment details in the employment account in national accounts, carried out once again as part of the 2014 revision of national accounts, it was established that the VAT statistics (advance VAT returns) in the enterprise sector do not cover all the services carried out in this industry group, particularly in terms of privately organised tuition and adult further education. This could possibly be because the resultant income is recorded under personal income tax, not VAT. The proportional allowance for freelance trainers covers services that are purchased from non-profit institutions serving households (S.15) (see Chapter 5.8). This allowance for exhaustiveness was determined in line with the 2005/2006 sport science report published by the Federal Institute of Sport Science (Bundesinstitut für Sportwissenschaft)³⁰. A further investment group-specific adjustment of turnover figures from VAT statistics (advance VAT returns) is carried out in industry sector 85.4, which includes universities. Given the reintegration of universities from the enterprise sector into the general government sector as part of the 2011 revision of national accounts, the VAT advance VAT returns data are adjusted to take into account the sales made by general government units in sector S.13, in order to prevent double entry in both sectors in the national accounts.
- 3.464 Once the aforementioned adjustments for exhaustiveness have been added to output, this provides the output for industry sector P (WZ 85) in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts. This applies

³⁰ Horch, H-D, Hovemann, G. and Schubert, M., 'Bezahlte Mitarbeit im Sportverein' in C. Breuer (ed.), Sportentwicklungsbericht für Deutschland. Scientific reports and materials from the Federal Institute of Sport Science, Cologne 2007.

to own-account software for the education industry sector. **Own-account research and development** actually should be taken into account for the non-financial corporations sector in terms of further ESA-compliant implementation (see Chapter 5.10.4 for more details about research and development calculations), but this is of little significance in this industry sector.

Determining intermediate consumption

- 3.465 The calculation of **intermediate consumption** for all the industry groups in industry sector P for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output.
- 3.466 The only **main source of data** currently available is the four-yearly results of the 2010 cost structure statistics in the other services sectors for driving/flying school services. Corresponding intermediate consumption ratios are determined using these results (ratio of expenditure to turnover) and the previous time series for intermediate consumption ratios, which are still based on comprehensive data from the relevant previous cost structure statistics), are then extrapolated. The reforms of structural service statistics, planned at European level as part of the Framework Integration Business Statistic (FRIBS), have brought about significant improvement in the source data. These reforms have expanded the survey scopes specifically for the service structure survey (SiD), particularly including the activities of industry sector P.
- 3.467 Corresponding expenditure is determined during data validation using the same method as for determining output. As no data validation was required in the education industry sector in 2010 when calculating output, there are also no validations for determining intermediate consumption. The same also applies to changes in inventories of works in progress and finished products. The national accounts figures for intermediate consumption are compiled by adding the source data and data validation, plus corresponding intermediate consumption for own-account fixed capital formation.
- 3.468 Intermediate consumption for further **adjustments for exhaustiveness** in line with ESA 2010 is basically determined using the respective industry-specific intermediate consumption ratio (calculated as a percentage ratio of intermediate consumption to output).
- 3.469 Once the **conceptual changes** have been added to intermediate consumption, this provides the intermediate consumption for industry sector P (WZ 85) in line with national accounts concepts. In order to transpose the data to published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10), with the latter item not being significant in industry sector P.

Deriving gross value added

- 3.470 Gross value added for the industry sector P is calculated by subtracting intermediate consumption from output (subtraction method) for the integrated non-financial corporations and households sectors (S.11/S.14), as usual for market production.

The following table shows the results for output, intermediate consumption and gross value added, summarised by individual calculation step for industry sector P and all sectors once again.

Table 3–114: Derivation of national accounts results in the production approach

Section P: 'Education'

Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
	Non-financial corporations and households (S.11/S.14)		
Source data	9.129	2.823	6.307
+ Data validation	0.000	0.000	0.000
= Sub-total.....	9.129	2.823	6.307
+ Own-account fixed capital formation	0.002	0.001	0.001
+ Changes in inventories of finished products and work in progress	0.000	0.000	0.000
= National accounts figures	9.131	2.823	6.308
+ Adjustments for exhaustiveness (N types)	8.646	2.731	5.915
= Balance sheet result	17.778	5.554	12.223
+ Conceptual changes	0.035	-0.023	0.058
= National accounts result	17.813	5.531	12.282
+ Macroeconomic balancing	0.000	-0.339	0.339
+ FISIM.....	0.000	0.194	-0.194
+ Research and development	0.000	0.000	0.000
= National accounts result (S.11/S.14)	17.813	5.386	12.427
	Financial corporations (S.12)		
+ National accounts result (S.12)	0.000	0.000	0.000
	General government (S.13)		
+ National accounts result (S.13)	106.130	21.934	84.196
	Non-profit institutions serving households (S.15)		
+ National accounts result (S.15)	8.680	1.636	7.044
	Total economy (S.1)		
= Published figures	132.623	28.956	103.667

3.23 Human health and social work activities (NACE Rev. 2: Q)

3.471 On the production side, industry sector Q 'Human health and social work activities' is basically calculated in line with the three industry divisions (WZ 86, WZ 87 and WZ 88) of NACE Rev. 2 and/or WZ 2008. Several industry divisions have already been combined for national accounts publishing purposes in line with WZ special breakdown A*64 in NACE Rev. 2. Calculations for the three industry divisions are also

broken down further by industry group, primarily for the purposes of the input-output account. The same calculation methods are used for all industry groups and divisions within the 'Human health and social work activities' industry sector, albeit with the use of different source statistics.

Viewed across all national accounts sectors, table 3–115 shows the results of the production approach for industry sector Q and the corresponding industry divisions in 2010.

Table 3–115: Summary of the 'Human health and social work activities' publication area (NACE Rev. 2 Q)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					in EUR (billions)	in EUR (billions)	Share in		
			GVA in industry	Total GVA			GDP	GNI	
					in %				
1	Q	Human health and social work activities	242.973	79.007	163.966	100	7.1	6.4	6.2
2	QA	Human health activities	178.874	58.401	120.473	73.5	5.2	4.7	4.6
3	QB	Care homes and social work activities	64.099	20.606	43.493	26.5	1.9	1.7	1.7

In terms of sectors, this industry section includes general government (S.13) and non-profit institutions serving households (S.15), as well as non-financial corporations (S.11) and households (S.14). While most economic services in the healthcare sector are carried out by units of non-financial corporations (S.11) and households (S.14), in the social work activities sector (not including care homes), they are mainly carried out by non-profit institutions serving households (S.15). See Chapter 3.21 and/or Chapter 5.8 for details about calculations for the general government sector (S.13) for output, intermediate consumption and gross value added and calculations for the non-profit institutions serving households sector (S.15). The published figures for all sectors (S.1) are formed by adding the respective sector national accounts data.

The following derivation of the individual national accounts indicators in the production approach for industry section Q and its industry divisions and/or groups relates to the integrated national accounts sectors of non-financial corporations and households (S.11/S.14).

Determining output

- 3.472 Turnover data from multiple official and non-official sources, sometimes concurrent, are available as the **source data basis** for determining **output** for all three industry divisions and the industry groups in section Q.

3.473 Various **data sources** are selected for determining output for the industry groups in section Q with all due consideration of quality criteria such as exhaustiveness, accuracy and time availability. The main sources to be used are hospital statistics (EVAS 23111, 23112, 23121) for hospital activities; expenditure figures for statutory health insurance schemes (GKV) and cost structure statistics in the medical sector (EVAS 52571) for medical practice activities (WZ 86.21 and 86.22); official cost structure statistics in the medical sector and non-official cost structure surveys carried out by the German National Association of Statutory Health Insurance Dentists (KZBV) for dental practice activities (WZ86.23); cost structure statistics in the medical sector, cost structure statistics published by healthcare facilities (EVAS 52551), GKV data, VAT statistics (advance VAT returns) (EVAS 73311) and income tax statistics (EVAS 73111) for human health activities n.e.c.; and care statistics (EVAS 22411, 22412) and VAT statistics (advance VAT returns) for care homes and social work activities.

Hospital activities (WZ 86.10)

3.474 In terms of calculating output for hospitals, most are market producers (with the exception of prison hospitals), as more than 50% of costs are covered by sales. For this reason, in contrast to the previous German national accounts, hospital activities (WZ 86.10) have now been recorded as market producers since the 1999 revision (1998 interim revision), regardless of the nature of their sponsoring body.

The main calculation basis is available here in the form of annual hospital statistics, which give detailed information about hospital equipment, performance and costs. This survey was introduced in 1991 and provides information for the determination of output in this area with a highly detailed breakdown of the data. Due to the conversion of hospital cost statements to the netting principle as part of hospital statistics, an alternative data source was established for determining hospital output during the period 1996 to 2001, namely hospital treatment expenditure (including rehabilitation). German hospital costs have again been recorded using gross figures since the 2002 reporting year, meaning that a return to hospital statistics could be carried out in the 2011 revision.

Medical practice activities (WZ 86.21 and 86.22)

3.475 The output of medical practices is calculated with the aid of expenditure figures for the statutory health insurance schemes for medical treatment, from their annual reports and accounts. After reconciliation with the expenditure approach, this value was originally increased, by the statutory social security insurance bodies, to the total material purchases for all medical services, including dialysis and maternity support services alongside actual medical services. In line with a revised method, the accounting item from the Federal Ministry of Health (BMG) statistics KJ1 and KV45 'Payments made to statutory health insurance' has been used as the output lower limit for income from panel practice since the 2014 revision.

Doctors' income from private practice and from other independent medical activity is added to this figure. These additions are obtained from official four-yearly cost structure medical statistics (here, the cost structure statistics for physicians), calculated by applying the ratio of income from panel practice, private practice and other independent medical activity. The most recently published cost structure statistics in 2011 showed that there was a growing element of private billing for medical practices, reaching 31.3% in comparison to 29.0% in 2007 cost structure statistics. Determined using interpolation, the proportion of income from private practice and other independent medical activity for 2010 was 30.7%.

Dental practice activities (WZ 86.23)

- 3.476 The annual cost structure surveys by the German National Association of Statutory Health Insurance Dentists (KZBV), published in the KZBV yearbook, are used to calculate output for dental practices. The recorded average income per dental practice proprietor is multiplied by the number of registered dentists to give the turnover volume for dental practices, but this should only be considered the lower limit for output. An allowance is therefore added to cover outpatient dental treatment that is not included in the KZBV statistics, e.g. dental services purchased on a purely private basis and the privately invoiced services of dentists employed in hospitals or similar institutions.

Human health activities n.e.c. (WZ 86.90)

- 3.477 Output calculations for psychotherapists and psychologists' practices (WZ 86.90.1), medical massage, physiotherapy, hydrotherapy and midwifery (WZ 86.90.2) and other independent activities in the field of healthcare (WZ 86.90.9) are based on account data for statutory health insurance schemes. Any turnover not calculated using statutory health insurance schemes data is determined on the basis of turnover figures in the cost structure statistics for the medical sector (here: doctors). Output is then calculated after adding a further 10% allowance for under-reporting.

The rest of the figures for other healthcare facilities and institutions (parts of WZ 86.90.9 relating to items WZ 85.14.5 and 6 from the previous NACE REV 1.1) are derived from VAT statistics. An allowance of 60% is also added to cover VAT-exempt turnover, which may play a significant role here.

Calculation of output for practices run by non-medical practitioners (WZ 86.90.3) was revised entirely in the 2015 revision. The reason for this was the fundamentally unsatisfactory situation up until that point, in which the original calculation was still based on the 1987 workplace census and output for the following years had been estimated by extrapolating this benchmark value in line with the development of private health insurance schemes (PKV) for medical treatment. The new method of calculating output for practices run by non-medical practitioners is based on information from income tax and VAT statistics. The new output figure is determined by multiplying average turnover and the number of practices/enterprises.

Care homes and social work activities (WZ 87 and 88)

- 3.478 Care statistics that had first delivered results for the reporting year 1999 were implemented as part of the 2005 revision in the **care (in-patient and out-patient)** sector.

As of the 2005 revision, output for **Care homes (WZ 87.10)** has been based on the 1999 and 2001 care statistics and was determined in connection with a Eurostat project measuring volumes for social work activities³¹ Starting in 1999, the years 1996 to 1998 were derived on the basis of care statistics for homes using the growth rate of benefits recipients according to the Federal Ministry of Health. Data from this study are also available for the intermediate years (2000, 2002).

Care insurance was introduced on 1 July 1996 for the in-patient sector. In that year, there was input from the project report, although it only referred to the second half of

³¹ 'Weiterentwicklung der Methoden der Preis- und Volumenmessung in den Volkswirtschaftlichen Gesamtrechnungen – Beseitigung von C-Methoden' – internal final report on the research project commissioned by Eurostat, 1/2004.

the year. In line with the expenditure approach, this figure was doubled in the 2005 revision in order to cover the entire year.

In the 2005 revision, all homes were assigned to the enterprise sector on the assumption that the costs are to a large extent covered and there is an obligation to keep accounts. In turn, this meant that calculations for non-profit institutions serving households had to be adjusted, because these units had always previously been included in value added calculations for non-market producers. The individual components, i.e. mainly compensation of employees, therefore had to be reduced accordingly to prevent double counting. A corresponding sectoral adjustment also had to be made in employment figures.

Like in the case of inpatient care, as part of the Eurostat project on measurement of volumes in the social work sector for the 2005 revision, output in the **visiting social services sector (WZ 88.10.1)** was determined for all three sectors going back to 1995 on the basis of the 1999 and 2001 care statistics. However, only the sector output figures for the industry sector were used and taken into account for the industry sector output calculations.

Overall, around 75% of output for industry sector QB 'Care homes and social work activities' comprised figures for care homes (WZ 87.10) and visiting social services (WZ 88.10.1), and was therefore covered primarily by care statistics.

- 3.479 VAT statistics (advance VAT returns) are used as the baseline values for calculating output in almost all other cases. Even though the aforementioned main sources are used as the main sources for calculating output in all three industry divisions (WZ 86, WZ 87 and WZ 88) in the human health and social work activities industry sector, the results of all the other aforementioned sources are continuously observed, analysed and compared to the main source used, in order to check exhaustiveness. In order to ensure exhaustiveness, the output figures calculated in this accounting stage are also regularly reconciled with the data from official health expenditure accounts (GAR) (EVAS 23611).
- 3.480 Once the main data source to be used has been defined using the VAT statistics (advance VAT returns), the source data are then reduced partially in the next work step as part of **data validation** by turnover results, on the basis of findings in the expenditure approach. For example, in the homes industry division (WZ 87), turnover was dominated by care homes (in-patient care, classified as WZ 87.10 with care statistics as the source) at almost 80% of the total figures. VAT statistics (advance VAT returns) were used to determine the rest across all industry sectors (WZ 87.1, 87.2, 87.3 and 87.9) and only applied proportionally for the enterprise sector (here: 70% of VAT volume).
- 3.481 In order to ensure **exhaustiveness in line with ESA 2010**, the next work step involves further adjustments, some of which cover all the industry divisions in industry sector Q (see Chapter 7 for details). Allowances for turnover from illegal employment are also made in the industry divisions of industry sector Q. Industry group-specific adjustments for exhaustiveness are also carried out, some of which have already been described in the sections on calculating output for medical and dental practices (WZ 86.2), human health activities n.e.c. (WZ 86.9) and care homes and social work activities (WZ 87 and WZ 88). In particular, this includes income from private billing, practice charges (2004 to 2012) and dental treatment not included in KZBV statistics for the medical and dental practices industry group. In the sector for human health activities n.e.c., adjustments for exhaustiveness include allowances for imputed under-reporting and income from private billing, as well as allowances for recording VAT-exempt services specifically for other independent activities in the field of

healthcare (WZ 86.90.9) and the care homes and social work activities industry sector (WZ 87 and WZ 88).

- 3.482 Once the aforementioned adjustments for exhaustiveness have been added to output calculations, this provides the output for the individual industry divisions of industry sector Q in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts, as for own-account software. Own-account research and development is also to be taken into account for the non-financial corporations sector in terms of further ESA-compliant implementation (see Chapter 5.10.4 for more details about research and development calculations).

The following table shows the individual work steps for determining output for the three industry divisions in industry sector Q for the integrated sectors of non-financial corporations and households (S.11/S.14) once again.

Table 3–116: Derivation of output by industry division

Section Q: 'Human health and social work activities'

Year 2010 in EUR (billions)

List	WZ 86	WZ 87	WZ 88	Sec. Q
Non-financial corporations and households (S.11/S.14)				
Source data.....	143.214	27.701	7.822	178.736
+ Data validation.....	0.000	-2.191	0.000	-2.191
= Sub-total.....	143.214	25.510	7.822	176.545
+ Own-account fixed capital formation.....	0.000	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress.....	0.000	0.000	0.000	0.000
= National accounts figures	143.214	25.510	7.822	176.545
+ Adjustments for exhaustiveness (N types)	27.903	1.393	1.300	30.597
= Balance sheet result	171.117	26.903	9.122	207.142
+ Conceptual changes.....	0.143	0.010	0.008	0.161
= National accounts result	171.260	26.913	9.131	207.304
+ Macroeconomic balancing	0.000	0.000	0.000	0.000
+ FISIM.....	0.000	0.000	0.000	0.000
+ Research and development.....	2.134	0.000	0.000	2.134
= Output (S.11/S.14).....	173.394	26.913	9.131	209.438
Financial corporations (S.12)				
+ Output (S.12).....	0.000	0.000	0.000	0.000
General government (S.13)				
+ Output (S.13).....	3.745	1.325	1.938	7.008
Non-profit institutions serving households (S.15)				
+ Output (S.15).....	1.735	4.549	20.243	26.527
Total economy (S.1)				
= Published figures.....	178.874	32.787	31.312	242.973

Determining intermediate consumption

- 3.483 The calculation of **intermediate consumption** for all three industry divisions in section Q for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output.
- 3.484 Annual hospital statistics are used as the data basis for calculating intermediate consumption in the hospital activities sector (WZ 86.10). They provide information for determining output and intermediate consumption broken down in detail for this area. In the medical practice sector (WZ 86.21 and 86.22), the intermediate consumption ratio is determined using the official four-yearly cost structure statistics for the medical sector (here: cost structure statistics for doctors). Data from the non-official annual cost structure surveys by the KZBV are initially used to calculate intermediate consumption in the dental practice sector (WZ 86.23). Average ratios can be determined and used in the accounting years (as in 2010) with this information and the official four-yearly cost structure statistics for the medical sector (here: cost structure statistics for dentists). Like for doctors and dentists, the official four-yearly cost structure statistics for the medical sector (here: cost structure statistics for psychotherapists and psychologists' practices) are used as the basis for determining intermediate consumption for psychotherapists and psychologists' practices (WZ 86.90.1).
- 3.485 In terms of the healthcare facilities industry group (WZ 86.90) and the care homes (WZ 87) and social work activities (WZ 88) industry divisions, these were integrated into official four-yearly cost structure statistics in other service sectors as part of conversion to WZ 2008. First published in 2012, the cost structure data is now used again in interpolated form in the production approach.
- 3.486 Corresponding expenditure is determined during data validation using the same method as for determining output. The national accounts figures for intermediate consumption are compiled by adding the source data and data validation.
- 3.487 Intermediate consumption for further **adjustments for exhaustiveness** in line with ESA 2010 is basically determined using the respective industry-specific intermediate consumption ratio (calculated as a ratio of intermediate consumption to output). Only half the corresponding intermediate consumption ratio is used for the allowance for illegal employment, given the lack of precise information.
- 3.488 Once the **conceptual changes** have been added to intermediate consumption, this provides the intermediate consumption for each industry division in line with national accounts concepts. In order to transpose the data to published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10).

Table 3–117 shows a summary of the individual intermediate consumption calculation phases for industry section Q once again for the integrated non-financial corporations and households sectors (S.11/S.14).

Table 3–117: Derivation of intermediate consumption by industry division

Section Q: 'Human health and social work activities'

Year 2010 in EUR (billions)

List	WZ 86	WZ 87	WZ 88	Sec. Q
	Non-financial corporations and households (S.11/S.14)			
Source data.....	50.397	9.722	2.008	62.127
+ Data validation.....	0.000	-0.747	0.000	-0.747
= Sub-total.....	50.397	8.975	2.008	61.380
+ Own-account fixed capital formation.....	0.000	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress.....	0.000	0.000	0.000	0.000
= National accounts figures	50.397	8.975	2.008	61.380
+ Adjustments for exhaustiveness (N types)	6.826	0.330	0.189	7.345
= Balance sheet result	57.223	9.305	2.197	68.725
+ Conceptual changes.....	-0.443	-0.045	-0.017	-0.505
= National accounts result	56.780	9.260	2.180	68.220
+ Macroeconomic balancing	-3.159	-0.487	-0.192	-3.838
+ FISIM.....	1.911	0.142	0.062	2.115
+ Research and development.....	-0.208	0.000	0.000	-0.208
= Intermediate consumption (S.11/S.14)	55.324	8.915	2.050	66.289
	Financial corporations (S.12)			
+ Intermediate consumption (S.12)	0.000	0.000	0.000	0.000
	General government (S.13)			
+ Intermediate consumption (S.13)	2.483	0.429	0.746	3.658
	Non-profit institutions serving households (S.15)			
+ Intermediate consumption (S.15)	0.594	1.555	6.911	9.060
	Total economy (S.1)			
= Published figures.....	58.401	10.899	9.707	79.007

Deriving gross value added

3.489 Gross value added for the individual industry divisions of industry section Q is calculated by subtracting intermediate consumption from output (subtraction method) for the integrated non-financial corporations and households sectors (S.11/S.14).

The following Table 3–118 shows the results for output, intermediate consumption and gross value added, summarised by individual calculation step for industry sector Q and all sectors once again.

Table 3–118: Derivation of national accounts results in the production approach

Section Q: 'Human health and social work activities'

Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
	Non-financial corporations and households (S.11/S.14)		
Source data.....	178.736	62.127	116.609
+ Data validation.....	-2.191	-0.747	-1.444
= Sub-total.....	176.545	61.380	115.165
+ Own-account fixed capital formation.....	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress.....	0.000	0.000	0.000
= National accounts figures.....	176.545	61.380	115.165
+ Adjustments for exhaustiveness (N types)	30.597	7.345	23.252
= Balance sheet result.....	207.142	68.725	138.417
+ Conceptual changes.....	0.161	-0.505	0.666
= National accounts result	207.304	68.220	139.084
+ Macroeconomic balancing	0.000	-3.838	3.838
+ FISIM.....	0.000	2.115	-2.115
+ Research and development.....	2.134	-0.208	2.342
= National accounts result (S.11/S.14).....	209.438	66.289	143.149
	Financial corporations (S.12)		
+ National accounts result (S.12).....	0.000	0.000	0.000
	General government (S.13)		
+ National accounts result (S.13).....	7.008	3.658	3.350
	Non-profit institutions serving households (S.15)		
+ National accounts result (S.15).....	26.527	9.060	17.467
	Total economy (S.1)		
= Published figures.....	242.973	79.007	163.966

3.24 Arts, entertainment and recreation (NACE Rev. 2: R)

3.490 On the production side, this industry section is basically published in line with industry divisions WZ 90, WZ 91, and WZ 92 (integrated) and WZ 93 of NACE Rev. 2 and/or WZ 2008; calculations themselves are carried out in more detail. Various calculation methods are used for the industry groups and divisions of the industry sector, depending on the source data.

Table 3–119: Summary of the 'Arts, entertainment and recreation' publication area (NACE Rev. 2 R)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					Share in				
			in EUR (billions)	in EUR (billions)	GVA in industry	Total GVA	GDP	GNI	
					in %				
1	R	Arts, entertainment and recreation	49.349	18.797	30.552	100	1.3	1.2	1.2
2	90–92	Art and culture, gambling.....	29.340	10.204	19.136	62.6	0.8	0.7	0.7
3	93	Sport, entertainment and recreation.....	20.009	8.593	11.416	37.4	0.5	0.4	0.4

In terms of sectors, this industry section includes general government (S.13) and non-profit institutions serving households (S.15), as well as non-financial corporations (S.11) and households (S.14). See Chapter 3.21 and/or Chapter 5.8 for details about calculations for the general government sector (S.13) for output, intermediate consumption and gross value added and calculations for the non-profit institutions serving households sector (S.15). The published figures for all sectors (S.1) are formed by adding the respective sector national accounts data.

The following derivation of the individual national accounts indicators in the production approach for industry section R and its industry divisions and/or groups relates to the integrated national accounts sectors of non-financial corporations and households (S.11/S.14).

Determining output

3.491 Turnover data from multiple official sources are available as the **source data basis** for determining **output** for all four industry divisions and the industry groups in sector R. The annual official sources include VAT statistics (based on advance VAT returns and, with a longer time interval, those based on assessments), the statistical business register, statistics on tax revenue, the cash results of the overall public budget and special assessments. For the 'Fitness centres' industry group (WZ 93.13), results from cost structure surveys carried out every four years are also available for the first time for the reporting year 2010 (subject-matter series 2, series 1.6.3).

3.492 In general, turnover data from VAT statistics based on advance VAT returns (EVAS 73311) are used as the main source for calculating output in industry divisions WZ 90, 91, 92 and 93. A special assessment based on statistics on tax revenue (EVAS 71211) and the collected revenue for public budgets is used to determine data for casinos and gaming clubs (WZ 92.00.2) and for turf accountancy, football pools and lotteries (WZ 92.00.3). The VAT statistics based on assessments (EVAS 73321) also include small enterprises, i.e. those with annual turnover below the (current) turnover threshold of EUR 17 500 per annum. However, the results of these statistics and currently also those of the statistical business register (EVAS 52111) are only made available with a time lag of almost four years/three years after the end of the reporting period. Data from these two sources would therefore not be available for the original production calculations carried out every summer for the reporting year $t - 2$ years. By contrast, the VAT statistics (advance VAT returns) meet the quality criterion of time availability, as the results of this survey are usually available around 18 months after the end of the reporting period. The results for small enterprises from annual VAT statistics (assessments) can nevertheless still be used in output calculations to ensure exhaustiveness, in a later work phase described below. The results of all the aforementioned sources are naturally also continuously observed, analysed and compared to the main source used, in order to check exhaustiveness.

Special calculation for 'Casinos and gaming clubs' (WZ 92.00.2)

3.493 Output for this sector is initially derived from VAT statistics (taxable and tax-exempt turnover). 35% of the gross proceeds from gaming activities are also considered as the staff tronc for roulette, with an additional allowance for the so-called pages' tronc. A further amount, representing 5% of the taxable turnover, is added to cover other tips.

Special calculation for 'Turf accountancy, football pools and lotteries' (WZ 92.00.3)

3.494 Output for this five-digit WZ 2008 heading is derived indirectly from the betting and lottery tax collected revenue (statistics on tax revenue). The first step in the calculation involves multiplying this revenue by the applicable rate of taxation in order to obtain total turnover, and the second step involves subtracting winnings paid out, which are divided into tote payments, payments made by bookmakers, etc., payouts from other racing bets and payments made by pools and lottery companies. This amount is then increased by the total value of taxable turnover for secondary activities.

Within the framework of the statistics on tax revenue, winnings paid out and other payouts (e.g. casino payouts) are also recorded, as well as public state income from lotteries, since enterprises that run number lotteries and football pools are also obliged to pay out winnings (pure profit after tax deduction) or concessions.³²

3.495 Once the main data sources to be used have been defined using the VAT statistics (advance VAT returns) and statistics on tax revenue, the source data are then adjusted in the next work step as part of **data validation**, to take account of incorrect attributions of units to economic sectors in VAT statistics. Using the business register and individual case inspections as part of data validation, the results of the VAT statistics (advance VAT returns) were converted as the result of incorrect attributions of units from WZ No 96.09 'Other service activities n.e.c.' (see also section 3.25) to WZ No 92.00.1 'Amusement arcade and gaming machine activities'. VAT statistics results were also adjusted to take account of the market turnover of general government units (S.13) and non-profit institutions serving households S.15), in order to prevent

³² See: Dietz, O. 'Öffentliche Einnahmen aus Glücksspielen', in WiSta 3/2003, pp. 252 et seq.

multiple entry of the same units in both the corporations sector (S.11/S.14) and the general government sector (S.13) and/or non-profit institutions serving households sector (S.15) in national accounts.

- 3.496 Own-account fixed capital formation derived from earlier cost structure statistics for possible comparable sectors are then added to the turnover data previously calculated in order to determine output in the national accounts. Changes in inventories of work in progress and finished products are of lesser importance in this industry sector.
- 3.497 In order to ensure **exhaustiveness in line with ESA 2010**, the next work step involves further adjustments, some of which cover all the industry divisions and groups in sector R. For example, this applies to allowances for under-reporting of the turnover of units below the annual turnover threshold (EUR 17 500) in the VAT statistics (advance VAT returns). The turnover of small enterprises as listed in VAT statistics is used as the data basis for calculating this allowance for exhaustiveness, based on assessments that are normally available four years after the end of the reporting year. Economic activity-specific allowance factors are generated from VAT assessment statistics for each industry sector in sector R, using the percentage ratio of small enterprise turnover to all turnover in the assessment statistics, in order to estimate the corresponding turnover results. Allowances are also made in the industry divisions of industry sector R for turnover from illegal employment (see Chapter 7 for details). As already described in the special calculation sections, a specific allowance is also made for *tronc*, pages' *tronc* and tips in the casinos and gaming clubs sector (WZ No 92.00.2), as well as a proportional allowance for freelance trainers in the sport, entertainment and recreation sector (WZ 93). These are services purchased from non-profit institutions serving households (S.15) (see Chapters 5.8 and 3.22). A valuation adjustment is also carried out for a mark-up in relation to own-account fixed capital formation in this industry division.
- 3.498 Once the aforementioned adjustments for exhaustiveness have been added to output calculations, this provides the output for the individual industry divisions of industry sector R in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts, e.g. the production of copyright licences. Own-account research and development is also to be taken into account for the non-financial corporations sector (see Chapter 5.10.4 for more details about research and development calculations).

The following table shows the individual work steps for determining output for the four industry divisions in section R for the integrated sectors of non-financial corporations and households (S.11/S.14) once again.

Table 3–120: Derivation of output by industry division

Section R: 'Arts, entertainment and recreation'

Year 2010 in EUR (billions)

List	WZ 90	WZ 91	WZ 92	WZ 93	Sec. R
	Non-financial corporations and households (S.11/S.14)				
Source data	6.402	0.883	10.197	12.442	29.924
+ Data validation	-0.266	-0.153	0.073	-3.152	-3.497
= Sub-total.....	6.136	0.730	10.270	9.290	26.427
+ Own-account fixed capital formation	0.000	0.001	0.000	0.024	0.024
+ Changes in inventories of finished products and work in progress.....	0.000	0.000	0.000	0.000	0.000
= National accounts figures	6.136	0.731	10.270	9.314	26.451
+ Adjustments for exhaustiveness (N types)	1.442	0.229	1.095	2.202	4.968
= Balance sheet result	7.578	0.960	11.365	11.516	31.419
+ Conceptual changes	0.425	-0.026	-1.632	-0.242	-1.475
= National accounts result	8.003	0.934	9.733	11.274	29.944
+ Macroeconomic balancing	0.000	0.000	0.000	0.000	0.000
+ FISIM.....	0.000	0.000	0.000	0.000	0.000
+ Research and development.....	0.000	0.012	0.000	0.000	0.012
= Output (S.11/S.14)				11.27	
	8.003	0.946	9.733	4	29.956
	Financial corporations (S.12)				
+ Output (S.12)	0.000	0.000	0.000	0.000	0.000
	General government (S.13)				
+ Output (S.13)	3.927	6.164	0.000	4.095	14.186
	Non-profit institutions serving households (S.15)				
+ Output (S.15)	0.249	0.318	0.000	4.640	5.207
	Total economy (S.1)				
= Published figures				20.00	
	12.179	7.428	9.733	9	49.349

Determining intermediate consumption

3.499 The calculation of **intermediate consumption** for all four industry divisions in sector R for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output.

Various model calculations, the four-yearly results from cost structure statistics as well as business reports for individual cases form the data basis for the calculation.

- 3.500 The intermediate consumption ratio for industry sector WZ No 92.00.1, amounting to 41.20% for 'Amusement arcade and gaming machine activities', is taken from an inter-company comparison of amusement machine enterprises in conjunction with the 'costs and services' model calculation; it was left constant for the following years on the assumption that the circumstances of this sector would remain largely unchanged.³³
- 3.501 In the past, a constant figure of 10% was used when determining the intermediate consumption ratio for WZ No 92.00.2 'Casinos and gaming clubs', on the grounds of the lack of explicit information. At the suggestion of Eurostat, corresponding intermediate consumption information for regional casinos in the Federal Gazette was used as the data source as of reporting year 1997, indicating the required profit and loss account items. As there were major fluctuations in the intermediate consumption ratios from this source both between the various regional casinos and over the course of time (between 10% and 47%), an average ratio was defined for the period 1997 to 2012, which was due to reach 28% in 2012. The ratio was increased by 1% each year as of 1994 (intermediate consumption ratio 10%) in order to reach the 28% ratio in 2012. The intermediate consumption ratio was 26% in 2010.
- 3.502 The intermediate consumption ratio in WZ No 92.00.3 'Turf accountancy, football pools and lotteries' is determined using the annual reports of various lottery associations and trusts.
- 3.503 For WZ 90 'Creative, arts and entertainment activities' and 91 'Libraries, archives, museums and other cultural activities', the intermediate consumption ratios from earlier cost structure statistics are used in conjunction with the 'liberal professions' for similar sectors.
- 3.504 The intermediate consumption ratios for the corporations sector S.11/S.14 are alternatively extrapolated using the development rates of intermediate consumption ratios for non-profit institutions serving households (S.15) in WZ 93 for WZ No 93.11 'Operation of sports arenas and stadiums', WZ No 93.12 'Sports associations', WZ No. 93.19 'Other sports activities'; WZ No. 93.21 'Amusement and theme parks' and WZ No. 93.29 'Other entertainment and recreation activities n.e.c.'. The only exception is WZ No 93.13 'Fitness centres', as corresponding results were only available for this sector for the first time for the reporting year 2010 as part of the four-yearly cost structure statistics (EVAS 52551 cost structure statistics in other service sectors).
- 3.505 Corresponding expenditure is determined during **data validation** using the same method as for determining output. The national accounts figures for intermediate consumption are compiled by adding the source data and data validation, plus corresponding intermediate consumption for own-account fixed capital formation.
- 3.506 Intermediate consumption for further **adjustments for exhaustiveness** in line with ESA 2010 is basically determined using the respective industry-specific intermediate consumption ratio (calculated as a percentage ratio of intermediate consumption to output). Only half the corresponding intermediate consumption ratio is used for the allowance for illegal employment per industry division, given the lack of specific information.
- 3.507 Once the **conceptual changes** have been added to intermediate consumption, this provides the intermediate consumption for each industry division in industry sector R

³³ See also: Vieweg, Hans-Günther: 'Die neue Spielverordnung konterkariert in der Anfangsphase die mit ihr verfolgten Ziele', in: ifo-Schnelldienst 2/2006, ifo Institut für Wirtschaftsforschung e.V. (Ed.), Munich 2006.

in line with national accounts concepts. In order to transpose the data into published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10).

Table 3–121 shows a summary of the individual intermediate consumption calculation phases for the integrated sectors for industry sector R once again.

Table 3–121: Derivation of intermediate consumption by industry division

Section R: 'Arts, entertainment and recreation'

Year 2010 in EUR (billions)

List	WZ 90	WZ 91	WZ 92	WZ 93	sec R
	Non-financial corporations and households (S.11/S.14)				
Source data	1.982	0.265	2.916	4.910	10.073
+ Data validation	-0.080	-0.046	0.030	-1.190	-1.286
= Sub-total.....	1.902	0.219	2.946	3.720	8.787
+ Own-account fixed capital formation	0.000	0.000	0.000	0.009	0.009
+ Changes in inventories of finished products and work in progress.....	0.000	0.000	0.000	0.000	0.000
= National accounts figures	1.902	0.219	2.946	3.729	8.796
+ Adjustments for exhaustiveness (N types)	0.420	0.054	0.216	0.817	1.508
= Balance sheet result	2.322	0.273	3.162	4.546	10.304
+ Conceptual changes	-0.483	-0.029	0.659	-0.277	-0.130
= National accounts result	1.839	0.244	3.821	4.269	10.174
+ Macroeconomic balancing.....	-0.170	-0.019	-0.163	-0.193	-0.545
+ FISIM.....	0.107	0.008	0.074	0.103	0.292
+ Research and development	0.000	-0.001	0.000	0.000	-0.001
= Intermediate consumption (S.11/S.14)	1.776	0.232	3.732	4.179	9.920
	Financial corporations (S.12)				
+ Intermediate consumption (S.12)	0.000	0.000	0.000	0.000	0.000
	General government (S.13)				
+ Intermediate consumption (S.13)	1.689	2.508	0.000	1.678	5.875
	Non-profit institutions serving households (S.15)				
+ Intermediate consumption (S.15)	0.124	0.143	0.000	2.735	3.002
	Total economy (S.1)				
= Published figures	3.589	2.883	3.732	8.593	18.797

Deriving gross value added

3.508 Gross value added for the individual industry divisions of industry sector R is calculated by subtracting intermediate consumption from output (subtraction method) for the integrated non-financial corporations and households sectors (S.11/S.14).

The following table shows the results for output, intermediate consumption and gross value added, summarised by individual calculation step for industry sector R and all sectors once again.

Table 3–122: Derivation of national accounts results in the production approach

Section R: 'Arts, entertainment and recreation'

Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
Non-financial corporations and households (S.11/S.14)			
Source data.....	29.924	10.073	19.851
+ Data validation.....	-3.497	-1.286	-2.211
= Sub-total.....	26.427	8.787	17.640
+ Own-account fixed capital formation.....	0.024	0.009	0.015
+ Changes in inventories of finished products and work in progress.....	0.000	0.000	0.000
= National accounts figures	26.451	8.796	17.655
+ Adjustments for exhaustiveness (N types)	4.968	1.508	3.460
= Balance sheet result	31.419	10.304	21.116
+ Conceptual changes	-1.475	-0.130	-1.345
= National accounts result	29.944	10.174	19.770
+ Macroeconomic balancing	0.000	-0.545	0.545
+ FISIM.....	0.000	0.292	-0.292
+ Research and development.....	0.012	-0.001	0.013
= National accounts result (S.11/S.14)	29.956	9.920	20.036
Financial corporations (S.12)			
+ National accounts result (S.12)	0.000	0.000	0.000
General government (S.13)			
+ National accounts result (S.13)	14.186	5.875	8.311
Non-profit institutions serving households (S.15)			
+ National accounts result (S.15)	5.207	3.002	2.205
Total economy (S.1)			
= Published figures.....	49.349	18.797	30.552

3.25 Other service activities (NACE Rev. 2: S)

3.509 The 'Other services activities' industry section is published in the national accounts in line with the three industry divisions WZ 94, WZ 95 and WZ 96 of NACE Rev. 2 and/or WZ 2008; calculations on the production side are carried out in more detail by industry group for both WZ 95 and 96. Various calculation methods are used for the industry groups and divisions of industry section S, depending on the source data.

Viewed across all national accounts sectors, Table 3–123 shows the results of the production approach for section S and the corresponding industry divisions in 2010.

Table 3–123: Summary of the 'Other service activities' publication area (NACE Rev. 2 S)

Year 2010

Serial no	WZ 2008	Industrial classification	Output	Inter-mediate consumption	Gross value added				
					in EUR (billions)	Share in			
						GVA in industry	Total GVA	GDP	GNI
					in EUR (billions)	in %			
1	S	Other service activities n.e.c.	85.299	25.801	59.498	100	2.6	2.3	2.3
2	94	Membership organisations, religious organisations	34.465	9.947	24.518	41.2	1.1	1.0	0.9
3	95	Repair of computer equipment and household goods	2.017	0.614	1.403	2.4	0.1	0.1	0.1
4	96	Other personal Service providers	48.817	15.240	33.577	56.4	1.4	1.3	1.3

In terms of sectors, this section includes general government (S.13) and non-profit institutions serving households (S.15), as well as non-financial and financial corporations (S.11 and/or S.12) and households (S.14). See Chapter 3.21 and/or Chapter 5.8 for details about calculations for the general government sector (S.13) for output, intermediate consumption and gross value added and calculations for the non-profit institutions serving households sector (S.15). The published figures for all sectors (S.1) are formed by adding the respective sector national accounts data.

The following derivation of the individual national accounts indicators in the production approach for section S and its industry divisions and/or groups relates to the integrated national accounts sectors of non-financial corporations and households (S.11/S.14).

Determining output

3.510 Turnover data from multiple official sources, sometimes concurrent, are available as the source data for determining **output** for industry divisions WZ 95 'Repair of

computer equipment and household goods' and WZ 96 'Other personal service activities', and for the corresponding industry groups. The annual official sources include VAT statistics (based on advance VAT returns (EVAS 73311) and, with a longer time interval, those based on assessments (EVAS 73321)) and the statistical business register (EVAS 52111). There are also turnover results from the annual structural survey in the service sector (SiD) (EVAS 47415) for industry division 95, as well as the results of the four-yearly cost structure surveys of saunas, solariums, hair and beauty salons, funeral parlours and washing and dry-cleaning enterprises for selected industry groups in WZ 96 (see the section on 'Calculating intermediate consumption').

- 3.511 Calculations for market producers in WZ 94 'Membership organisations, religious organisations' are thus mostly carried out in line with calculations for the more dominant non-market producer element in this sector, given the specific source data. There is therefore a detailed description in section 5.8 Final consumption expenditure of non-profit institutions serving households.
- 3.512 In general, turnover data from VAT statistics based on advance VAT returns are used as the main source for calculating output for the relevant industry groups within industry divisions 95 and 96. Although the VAT statistics based on assessments also include small enterprises, i.e. those with annual turnover below the (current) turnover threshold of EUR 17 500 per annum, the results of these statistics and currently also those of the statistical business register are only made available with a time lag of almost four years/three years after the end of the reporting period. Data from these two sources would therefore not be available for the original production calculations carried out every summer for the reporting year $t - 2$ years. By contrast, the VAT statistics (advance VAT returns) meet the quality criterion of time availability, as the results of this survey are usually available around 18 months after the end of the reporting period. The results for small enterprises from annual VAT statistics (assessments) are also included into output calculations to ensure exhaustiveness.
- 3.513 The results of all the aforementioned sources are naturally also continuously observed, analysed and compared to the main source used, in order to check exhaustiveness.
- 3.514 Once the main data source to be used has been defined using the VAT statistics based on advance VAT returns, the source data are then adjusted in the next work step as part of **data validation** to take account of incorrect attributions of units to economic sectors and sales revenues achieved in market production by general government units and/or non-profit institutions serving households (non-market producers). The latter adjustment is carried out in order to counteract multiple recording in different sectors in the national accounts. These validations only affect the 'Other personal service activities' industry division (WZ 96), which is particularly prone to corresponding incorrect attributions to economic sectors, given the heterogeneity and diversity of economic activities.
- 3.515 These adjustments are based on a detailed annual reconciliation of the results of the VAT statistics and those of the business register. For example, VAT statistics for WZ 96 were adjusted by EUR 3.229 billion for 2010. Most of the adjustment (EUR 2.635 billion) was the result of incorrect attributions to economic sectors in WZ No 96.09 'Other service activities n.e.c.', reclassified during validation into WZ 92.00.1 'Amusement arcade and gaming machine activities' (EUR 0.073 billion) and WZ 70 'Activities of head offices; management consultancy activities' (EUR 2.345 billion). Furthermore, turnover from market production for a general government unit incorrectly classified as WZ 96.09 (EUR 0.217 billion) was deducted in 2010. The remaining EUR 0.594 billion is attributable to the adjustment of turnover achieved on the market by the general government sector and non-profit institutions serving households.

- 3.516 Own-account fixed capital formation and changes in inventories of work in progress and finished products (output) are then added to the turnover figures taken from data sources and data validation. The relevant national accounts experts provide data broken down accordingly into industry for the latter indicator to calculate changes in inventories. Own-account fixed capital formation is calculated for WZ 95 'Repair of computers and personal and household goods' based on the service structure survey results for enterprises with an annual turnover of more than EUR 250 000. No data is directly available from these statistics for enterprises below this annual turnover threshold. To close these data gaps, the ratio of own-account fixed capital formation to gross fixed capital formation is determined for enterprises above the threshold, and this ratio is applied to smaller enterprises below the annual turnover threshold. This estimate is based on the assumption that the ratio of own-account fixed capital formation to total gross capital formation is the same for large and small enterprises.
- 3.517 For WZ 96 'Other personal service activities', own-account fixed capital formation is derived from earlier cost structure statistics in conjunction with the 'liberal professions'.
- 3.518 In order to ensure **exhaustiveness in line with ESA 2010**, the next work step involves further adjustments that cover industry divisions 95 and 96 in industry sector S (see Chapter 7 for details). For example, this applies to allowances for under-reporting of the turnover of units below the annual turnover threshold (currently EUR 17 500) in the VAT statistics (advance VAT returns). The turnover of small enterprises as listed in VAT statistics is used as the data basis for calculating this allowance for exhaustiveness, based on assessments after t - 4 years. Allowances for turnover from illegal employment are also made in these two industry divisions. This is basically carried out using a model based on the findings of the Financial Monitoring Unit to combat illicit employment, reporting to the Federal Ministry of Finance, available internally in the necessary level of detail (see Chapter 7 for details).
- 3.519 For WZ No 96.02.1 'Hair salons', a percentage surcharge is made on turnover figures obtained from the VAT statistics. The surcharge is calculated by comparing the results for household final consumption expenditure in hair salons from the sample surveys of income and consumption (EVS) (EVAS 632), published every five years, with the turnover of hair salons according to the VAT statistics (advance VAT returns). This deviating method was selected because the allowances determined in this way are far above those specified by VAT statistics (assessment).
- 3.520 Tips received that are to be recorded in line with the concepts of ESA 2010 both under compensation of employees and output are also taken into account in industry division 96. A valuation adjustment is also carried out for a mark-up in relation to own-account fixed capital formation in this division.

Special calculation for prostitution:

- 3.521 Prostitution, which has basically been legal in Germany since 2002, has long been included in German national accounts results. In terms of economic sector, prostitution is classified as industry class 96.09 'Other service activities n.e.c.'. Corresponding data for determining value added have been partly included in national accounts source statistics since legalisation. However, prostitution must generally be assumed to involve a high level of hidden economy activities.

Assumptions for prostitution in Germany are therefore based on a model calculation used to determine turnover and intermediate consumption for the various prostitution types, resulting in the determination of figures for prostitution in Germany overall. As part of the 2011 revision of national accounts, the calculation method used here was

converted to a new comprehensive model that complies with all corresponding European requirements (see also Chapter 7 for details).

The hidden economy activities element of prostitution is then estimated based on the data on official economic activity already reported in source statistics, and it is added to calculations of output and value added in this industry sector via the hidden economy model. The entire model calculation for prostitution is based on literature research. The resultant figures for prostitution were verified in specialist discussions with corresponding representatives and experts.

In industry class 96.09, these adjustments also covered the turnover figures from prostitution not included in the results of VAT statistics and other statistical sources.

Special calculations for the remuneration of government representatives

- 3.522 The remuneration of Federal, Länder and local government representatives and expense allowances for honorary appointees to government are determined by using public finance statistics and added to output in industry division 96. The intermediate consumption ratio is set at 25% in line with WZ 96.09 'Other service activities n.e.c.'.
- 3.523 Once the aforementioned adjustments for exhaustiveness have been added to output calculations, this provides the output for the individual industry divisions of industry sector S (with the exception of WZ 94) in line with the **business accounting** concept. Further **conceptual changes** (see also Chapter 3.4) are carried out in the transition from business accounting to national accounts concepts. Own-account research and development is also to be taken into account for the non-financial corporations sector in terms of further ESA-compliant implementation (see Chapter 5.10.4 for more details about research and development calculations), although this is of lesser importance in this industry sector.

The following table shows the individual work steps for determining output for the three industry divisions in industry sector S for the integrated sectors of non-financial corporations and households (S.11/S.14) once again.

Table 3–124: Derivation of output by industry division

Section S: 'Other service activities n.e.c.'

Year 2010 in EUR (billions)

List	WZ 94	WZ 95	WZ 96	Section S
	Non-financial corporations and households (S.11/S.14)			
Source data	9.328	2.463	39.143	50.934
+ Data validation	0.000	0.000	-3.229	-3.229
= Sub-total.....	9.328	2.463	35.914	47.706
+ Own-account fixed capital formation	0.000	0.000	0.011	0.011
+ Changes in inventories of finished products and work in progress	0.000	0.001	0.000	0.001
= National accounts figures	9.328	2.464	35.925	47.718
+ Adjustments for exhaustiveness (N types).....	0.000	0.211	14.813	15.024
= Balance sheet result.....	9.328	2.675	50.738	62.741
+ Conceptual changes	0.020	-0.658	-2.662	-3.300
= National accounts result.....	9.348	2.017	48.076	59.441
+ Macroeconomic balancing.....	0.000	0.000	0.000	0.000
+ FISIM	0.000	0.000	0.000	0.000
+ Research and development	0.000	0.000	0.000	0.000
= Output (S.11/S.14).....	9.348	2.017	48.076	59.441
	Financial corporations (S.12)			
+ Output (S.12).....	0.160	0.000	0.000	0.160
	General government (S.13)			
+ Output (S.13).....	0.000	0.000	0.741	0.741
	Non-profit institutions serving households (S.15)			
+ Output (S.15).....	24.957	0.000	0.000	24.957
	Total economy (S.1)			
= Published figures	34.465	2.017	48.817	85.299

Determining intermediate consumption

- 3.524 The calculation of **intermediate consumption** for two of the three industry divisions (excluding WZ 94) in industry section S for the integrated national accounts sectors of non-financial corporations and households (S.11/S.14) basically uses the same method as for determining output.
- 3.525 The annual results of the service structure survey (SiD) are used as the data source for WZ 95 and the various results of the four-yearly cost structure statistics are used for WZ 96 (EVAS 52551):

WZ 96.01 (Washing and dry-cleaning enterprises; subject-matter series 2; series 1.6.8)

WZ 96.02 (Hair and beauty salons; subject-matter series 2; series 1.6.4)

WZ 96.03 (Funeral parlours; subject-matter series 2; series 1.6.7)

WZ 96.04 (Saunas, solariums, baths and other similar activities; subject-matter series 2; series 1.6.3)

For WZ 96.09 (Other service activities n.e.c.), the intermediate consumption ratio is derived from earlier cost structure statistics, given the lack of current statistical survey information.

- 3.526 In line with the method for determining output, corresponding expenditure is calculated as part of **data validation**, with the intermediate consumption ratios determined for each economic activity being applied accordingly to the validation values as part of output calculation. The national accounts figures for intermediate consumption are compiled by adding the source data and data validation, plus corresponding intermediate consumption for own-account fixed capital formation and changes in inventories.
- 3.527 Intermediate consumption for further **adjustments for exhaustiveness** in line with ESA 2010 is basically determined using the respective industry-specific intermediate consumption ratio (calculated as a percentage ratio of intermediate consumption to output). Only half the corresponding intermediate consumption ratio is used for the allowance for illegal employment per industry division, given the lack of precise information. As described above, an intermediate consumption ratio of 25% is applied for the expenses of Federal, state and local government representatives and expense allowances for persons in honorary positions, in the same way as for WZ 96.09.
- 3.528 Once the **conceptual changes** have been added to intermediate consumption, this gives the intermediate consumption for each industry division (with the exception of WZ 94) in line with national accounts concepts. In order to transpose the data into published figures, these data are then modified to include macroeconomic adjustments (see Chapter 6), FISIM (see Chapter 3.17) and further ESA-compliant implementation for purchased research and development (see Chapter 5.10).

Table 3–125 shows a summary of the individual intermediate consumption calculation phases for industry section S once again for the integrated non-financial corporations and households sectors (S.11/S.14).

Table 3–125: Derivation of intermediate consumption by industry division

Section S: 'Other service activities n.e.c.'

Year 2010 in EUR (billions)

List	WZ 94	WZ 95	WZ 96	Section S
	Non-financial corporations and households (S.11/S.14)			
Source data	1.866	1.276	12.753	15.894
+ Data validation	0.000	0.000	-0.992	-0.992
= Sub-total.....	1.866	1.276	11.762	14.903
+ Own-account fixed capital formation	0.000	0.000	0.004	0.004
+ Changes in inventories of finished products and work in progress	0.000	0.000	0.000	0.000
= National accounts figures	1.866	1.276	11.766	14.907
+ Adjustments for exhaustiveness (N types).....	0.000	0.090	6.053	6.143
= Balance sheet result.....	1.866	1.367	17.818	21.050
+ Conceptual changes	0.000	-0.736	-2.695	-3.431
= National accounts result.....	1.866	0.631	15.123	17.620
+ Macroeconomic balancing.....	-0.210	-0.038	-0.909	-1.157
+ FISIM	0.061	0.021	0.684	0.766
+ Research and development	0.000	0.000	0.000	0.000
= Intermediate consumption (S.11/S.14)...	1.717	0.614	14.898	17.229
	Financial corporations (S.12)			
+ Intermediate consumption (S.12).....	0.033	0.000	0.000	0.033
	General government (S.13)			
+ Intermediate consumption (S.13).....	0.000	0.000	0.342	0.342
	Non-profit institutions serving households (S.15)			
+ Intermediate consumption (S.15).....	8.197	0.000	0.000	8.197
	Total economy (S.1)			
= Published figures	9.947	0.614	15.240	25.801

Deriving gross value added

3.529 Gross value added for the individual industry divisions of industry section S is calculated by subtracting intermediate consumption from output (subtraction method) for the integrated non-financial corporations and households sectors (S.11/S.14).

The following table 3–126 once again presents the results for output, intermediate consumption and gross value added, summarised by individual calculation step for industry section S and all sectors.

Table 3–126: Derivation of national accounts results in the production approach

Section S: 'Other service activities n.e.c.'

Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
	Non-financial corporations and households (S.11/S.14)		
Source data.....	50.934	15.894	35.040
+ Data validation.....	-3.229	-0.992	-2.237
= Sub-total.....	47.706	14.903	32.803
+ Own-account fixed capital formation.....	0.011	0.004	0.007
+ Changes in inventories of finished products and work in progress.....	0.001	0.000	0.000
= National accounts figures	47.718	14.907	32.810
+ Adjustments for exhaustiveness (N types)	15.024	6.143	8.881
= Balance sheet result	62.741	21.050	41.691
+ Conceptual changes	-3.300	-3.431	0.131
= National accounts result	59.441	17.620	41.821
+ Macroeconomic balancing	0.000	-1.157	1.157
+ FISIM.....	0.000	0.766	-0.766
+ Research and development.....	0.000	0.000	0.000
= National accounts result (S.11/S.14)	59.441	17.229	42.212
	Financial corporations (S.12)		
+ National accounts result (S.12)	0.160	0.033	0.127
	General government (S.13)		
+ National accounts result (S.13)	0.741	0.342	0.399
	Non-profit institutions serving households (S.15)		
+ National accounts result (S.15)	24.957	8.197	16.760
	Total economy (S.1)		
= Published figures.....	85.299	25.801	59.498

3.26 Household services (NACE Rev. 2: T)

3.530 In line with NACE Rev. 2 and WZ 2008, industry section T basically consists of two industries : services of households as employers (WZ 97) and undifferentiated goods- and services-producing activities of households for own use (WZ 98). The latter are not recorded in Europe in accordance with ESA 2010, Paragraph 1.24, as this industry division is not very significant in its scope. On the production side, calculation of gross value added is therefore carried out for WZ 97 within section T.

National accounts results are published in line with WZ special breakdown A*64 in ESA 2010 for industry section T. Table 3–127 shows the results of the production approach in 2010.

Table 3–127: Summary of the 'Undifferentiated goods- and services-producing activities of households for own use' publication area (NACE Rev. 2 T)

Year 2010									
Serial no	WZ 2008	Industrial classification	Output	Inter- mediate con- sumption	Gross value added				
					Share in				
			in EUR (billions)	in EUR (billions)	GVA in industry	Total GVA	GDP	GNI	
					in %				
1	T	Household services	6.567	0.000	6.567	100	0.3	0.3	0.2

In terms of sectors, all economic performance by household services is carried out by the sector (S.14), private households.

Determining output

- 3.531 The output of household services, calculated from gross value added, is measured by convention using the compensation of employees that is paid to staff, including compensation in kind (ESA 2010, Paragraph 3.87). There is no intermediate consumption in this industry, as the corresponding material expenditure is treated as final consumption expenditure by employers' households (ESA 2010, Paragraph 3.95). This means that the gross value added for household services corresponds to the output.
- 3.532 As for other industries, the number of employees in this industry is basically multiplied by the corresponding average gross wages and salaries, in order to calculate compensation of employees. Employers' social contributions are then added to the resultant gross wages and salaries to obtain the total for compensation of employees. As there are a large number of gaps in the statistical source data for the household services industry, both in terms of the number of employees and the average gross wages and salaries, a large proportion of the output calculations rely on estimates.

3.533 In calculating the number of employees and jobs, the following groups of employees are considered:

- Employees subject to social insurance contributions, exclusively marginally employed persons and exclusively short time employees
- + Allowance for under-coverage of employees subject to social insurance contributions
- + Allowance for under-coverage of exclusively marginally employed persons and short time employees
- = Total employees
- + Allowance for marginally employed persons in secondary employment
- = Jobs

3.534 The number of registered employees subject to social insurance contributions is obtained from the employment statistics (EVAS 13111). Data on exclusively marginally employed persons is also obtained from the statistical data material compiled by the Federal Employment Agency. However, the register data compiled by the Federal Employment Agency on employment in private households (cleaning and domestic services) do not provide a complete picture of the situation in this industry, as both the employer and employee often do not wish to register the relevant person as being employed. Significant allowances must therefore be made.

3.535 The **allowance for under-coverage of exclusively marginally employed persons** is based on the 2001/2002 time use survey (EVAS 63911). Amongst other things, this survey assesses demand among households for paid domestic services, distinguishing between 13 types of assistance. In terms of the required back-cast of these allowances to the employment statistics up to 1991, the employment account within the national accounts is orientated towards the development of the employment rate for married women as observed in the microcensus (EVAS 12211). However, information from the results of the socio-economic panel (SOEP)³⁴ is used for extrapolation up to the present day. Data from the ILO telephone survey (EVAS 13231) was also used for extrapolation purposes for the period between April 2003 and March 2004, and the period between September 2004 and April 2007. The proportion of households who employ people to carry out cleaning and domestic services is estimated using these statistics; the total number of households is taken from the microcensus.

3.536 The level for household activities and the proportion of households who employ people to carry out cleaning and domestic services – determined via the SOEP and the time use survey – is confirmed by other national and international surveys.

3.537 Allowances for the professional group of **employees subject to social insurance contributions** are also based on the 2001/2002 time use survey, plus data from the ILO telephone survey. However, extrapolation up to the present day is orientated towards the development of figures for employees subject to social insurance contributions that do not include employees of private households.

3.538 The estimate for **marginally employed part-time workers in secondary activities** is based on a 2003 study by Infratest Sozialforschung on behalf of the Federal Ministry of Labour and Social Affairs. The allowances for marginally employed person in second or third employment relationship become apparent in the compensation of employees in

³⁴ The SOEP was set up by TNS Infratest Sozialforschung on behalf of the German Institute for Economic Research (DIW) Berlin. Around 30 000 people in almost 11 000 households in Germany are surveyed each year (2015 figures).

the households sector. To avoid counting them twice, however, they are assigned to the industry in which their primary employment resides.

- 3.539 The total allowance on source value for 2010 was 210% for all the employee groups in total (including secondary activities).
- 3.540 **Average gross wages and salaries** for employees subject to social insurance contributions are orientated towards the collective agreement for household employees and centres supplying domestic services. They are extrapolated using the development of wages in this collective agreement.
- 3.541 The average wages for marginal part-time workers are determined in line with the statutory income threshold for marginal part-time work. They are also orientated towards the earnings relating to activities carried out in similar industries, which are backed up more comprehensively with statistics. When determining average gross wages and salaries, consideration is also given to the fact that a high level of hidden economic activities is assumed in this industry, particularly amongst those employees not subject to social insurance contributions.
- 3.542 Employers' social contributions are only payable for employees registered with the social insurance authorities. These contributions are calculated by applying the average rate of social contribution to the gross wages and salaries of registered employees as set out in the employment statistics.

- 3.543 Compensation of employees for 2010 is therefore calculated as follows (EUR billions):

Gross wages and salaries.....	6.425
+ Employers' social security contributions	0.142
= Compensation of employees	6.567

- 3.544 The low ratio between employers' social contributions and compensation of employees (2.2%) – the average for total economy is 19.1% – is mainly the result of the high implicit allowance on source values, and is therefore also an indicator of the extent to which the hidden economy plays a part in this industry.

The following table provides an overall picture of the production approach for the economic performance of household services (section T) in 2010:

Table 3–128: Derivation of national accounts results in the production approach

Section T: 'Household services'

Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
	Non-financial corporations and households (S.11/S.14)		
Source data.....	1.841	0.000	1.841
+ Data validation.....	0.000	0.000	0.000
= Sub-total.....	1.841	0.000	1.841
+ Own-account fixed capital formation.....	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress.....	0.000	0.000	0.000
= National accounts figures	1.841	0.000	1.841
+ Adjustments for exhaustiveness (N types)	4.726	0.000	4.726
= Balance sheet result	6.567	0.000	6.567
+ Conceptual changes	0.000	0.000	0.000
= National accounts result	6.567	0.000	6.567
+ Macroeconomic balancing	0.000	0.000	0.000
+ FISIM.....	0.000	0.000	0.000
+ Research and development.....	0.000	0.000	0.000
= National accounts result (S.11/S.14)	6.567	0.000	6.567
	Financial corporations (S.12)		
+ National accounts result (S.12)	0.000	0.000	0.000
	General government (S.13)		
+ National accounts result (S.13)	0.000	0.000	0.000
	Non-profit institutions serving households (S.15)		
+ National accounts result (S.15)	0.000	0.000	0.000
	Total economy (S.1)		
= Published figures.....	6.567	0.000	6.567

3.27 Activities of extra-territorial organisations and bodies (NACE Rev. 2: U)

3.545 Extraterritorial organisations and bodies are not relevant for the GDP calculations, since, by definition, they are not part of the economic territory. By contrast, the compensation of employees earned by residents from employment in extraterritorial organisations is recorded in gross national income (see Chapter 8).

3.28 Taxes on products, including VAT

3.546 Taxes on products (including VAT) include all taxes and similar levies that are payable per unit of a given good or service produced or transacted. They include VAT, taxes and duties on imports and other taxes on products. According to Paragraph 4.16 of ESA 2010, the following taxes are taxes on products:

Table 3–129: Taxes on products, including VAT
Year 2010 in EUR (billions)

Type of tax	
Taxes on products payable to the general government	262.162
VAT payable to the general government.....	180.213
Taxes and duties on imports (excise duties on imports)	15.296
Other taxes on products	66.653
Excise duties (excluding excise duties on imports).....	48.149
Insurance tax	10.262
Fire protection tax	0.326
Property transfer tax.....	5.291
Betting and lottery tax.....	1.412
Casino levy payable to the Länder.....	0.208
Other local taxes on products (including casino levy)	0.665
Contributions payable to the German National Petroleum Stockpiling Agency	0.340
+ Taxes on products payable to the European Union	4.165
Taxes and duties on imports (excluding excise duties on imports)	4.135
Customs duties	4.135
Agricultural levies and monetary compensatory amounts	0
Other taxes on products	0.030
Production levy on sugar, etc.	0.030
Co-responsibility levies on milk	0
= Total taxes on products	266.327

- 3.547 At the present time, excise duties are payable on electricity, energy, tobacco, coffee, sparkling wine, beer and spirits. As part of the 2014 major revision, casino tax and contributions payable to the German National Petroleum Stockpiling Agency were classified as other taxes on products.
- 3.548 For the other taxes on products levied jointly by the Federal and state governments and for those which are levied exclusively by one or the other (purely Federal or state government taxes), the necessary data are obtained from the tax reports compiled by the Federal Ministry of Finance. For purely local taxes, the public finance statistics (EVAS 71147) provide the requisite information, whereas for taxes that are payable to the European Union, the balance-of-payments statistics compiled by the Deutsche Bundesbank (EVAS 83111) are used.
- 3.549 In accordance with Regulation (EC) No 2516/2000 of the European Parliament and Council of 7 November 2000 for recording taxes and social contributions, the recording of cash receipts is time-adjusted where necessary depending on the type of tax. Not all the aforementioned tax types are affected by time adjustments. The deferred date of recording is determined by the payment date prescribed in the Finance Act. The following table shows by how many months the cash receipts for each type of tax are time adjusted. Since 2007, time adjustment for coffee tax has only been one month (previously two months).

Table 3–130: Time adjustment of cash receipts

Type of tax	Month(s)
Turnover tax ³⁵	1
Insurance tax	1
Tobacco duty.....	1
Beer duty	1
Electricity duty	1
Energy duty	2
Coffee duty.....	1
Sparkling wine duty	2
Spirits duty	2

- 3.550 The taxes on products play a two-fold role within the production approach in order to calculate GDP:
- 1) firstly, they are part of the adjustment process when the source 'balance-sheet' statistics are converted into national accounts concepts (see section 3.4);
 - 2) secondly, they serve as a general allowance (including VAT) that is added in the transition from gross value added for all industry sectors (valued at basic prices) to gross domestic product.
- 3.551 The first of these conversions affects only the category of 'Other taxes on production' and is necessary because the source statistics are generally inclusive of these taxes, and their values consequently have to be adjusted for insertion into the national

³⁵ Covers VAT and excise duties on imports

accounts at basic prices. For the valuation of taxes on production, the revenue for each type of tax is distributed among the relevant economic activities and reconciled with business statistics. This conceptual change has an impact on gross value added, but does not affect GDP.

- 3.552 The valuation of taxes and duties on imports depends on a special assessment in the case of excise duties on imports, because they do not accrue together with the cash receipts. These assessments are based on the results of special statistics on excise duties and the foreign trade statistics.

3.29 Subsidies on products

In 2010, the general government paid out EUR 7.898 billion in subsidies on products:

Table 3–131: Subsidies on products by subsidy provider

Year 2010 in EUR (billions)	
Subsidy provider	Subsidies on products
General government	7.898
Federal government.....	1.342
State government	4.474
Local government	2.082
Social security funds.....	0.000

- 3.553 The sources of data for the calculation of **subsidies on products** are the central government budget in the case of the Federal government, and the public finance statistics for state and local governments. The only subsidies paid from the social security funds are the income support payments made by the Federal Employment Agency, which means that there are no subsidies on products in the domain of the social security funds.
- 3.554 In accordance with the definition of subsidies on products in Paragraph 4.33 of ESA 2010, each item in government budget that relates to the payment of a subsidy is examined to establish whether it is calculated ad valorem as a specified percentage of the price per unit or quantity of a good or service, whether it is calculated as the difference between a specified target price and the market price actually paid by a buyer. The recently agreed general government scrapping bonus for purchasing a new or used car also meets the criteria for a subsidy on goods in accordance with ESA 2010. In 2010, this amounted to EUR 0.731 billion.
- 3.555 In the case of subsidies paid by state and local governments, the large amount of public budgets does not permit the same method to be used. The criteria specified in Paragraph 4.33 of ESA 2010 are used to identify any state and local government budgetary areas in which subsidies are based on quantities of goods and services and those in which they are based on unit prices, in line with the definitions in Paragraph 4.33 of ESA 2010. In the case of state government, the bulk of these subsidies are paid to railway operators and transport services to subsidise local public transport, while the local government subsidies are paid exclusively to transport services. The subsidies provided in these sectors are recorded as subsidies on products.

- 3.556 Subsidies on products are recorded in compliance with ESA 2010 Paragraph 4.39 when the transaction or the event (production, sale, import, etc.) that gives rise to the subsidy on products occurs.
- 3.557 Within the framework of the production approach to the valuation of GDP, the subsidies on products which are identified in this way are broken down and assigned to the industries of their respective recipients, then added as a reallocation to the source balance-sheet data for determining gross value added and output, so as to arrive at the price concept of the basic prices (see section 3.3). For the transition to GDP, however, the subsidies on products are deducted again en masse, which means that the final GDP figure does not include subsidies and that the calculation of subsidies does not affect the GDP.

Chapter 4 Income approach

4.0 Calculating GDP on the basis of distributive transactions

4.01 Domestic product and national income may be calculated by considering them from the product side, in other words by assessing output or the use of goods and services; however, these can also be found via the income approach. The latter is not possible in Germany, however, given the lack of baseline information about entrepreneurial income and/or operating surplus. The level and development of GDP are determined using only the production and expenditure approaches.

4.02 Calculating them using the income approach would require the calculation of the income received from employment and assets generated by involvement in the production process. Income can be seen as the reward for capital and labour as factors of production. Looking at this from the aspect of the income generated within Germany, the following values have to be determined:

$$\begin{aligned}
 & \text{Compensation of employees (domestic)} \\
 & + \text{ Net operating surplus/mixed income} \\
 & = \text{ Net domestic product at factor cost} \\
 & + \text{ Taxes less subsidies on production and imports} \\
 & = \text{ Net domestic product at market prices} \\
 & + \text{ Consumption of fixed capital} \\
 & = \text{ Gross domestic product}
 \end{aligned}$$

4.03 An original calculation is only possible for domestic compensation of employees (see Section 4.7), taxes less subsidies on production (see Sections 4.8 and 4.9) and consumption of fixed capital (see Section 4.12), not for net operating surplus and mixed income. Net operating surplus, including mixed income is determined residually for the entire economy with the help of the production approach. Intermediate consumption, compensation of employees, consumption of fixed capital and other taxes on production less other subsidies on production are subtracted from the figure for output for the calculation of net operating surplus used in the income approach.

4.04 For the production account and generation of income account, calculations in the production approach are carried out firstly in the form of calculation by economic activity and secondly as sectoral calculations (see Chapter 3 for more details about these calculations). Calculations for the financial corporations (S.12) and general government (S.13) sectors are based on original source statistics. For the non-profit institutions serving households sector (S.15), model-based calculations are carried out for the production account and generation of income account on the basis of employment figures. Figures for the production and generation of income account for the non-financial corporations (S.11) and households (S.14) sectors are determined together in the production approach on the basis of numerous source statistics. With the exception of the special assessment for the housing services sector (see section 3.18.2), the distribution of transactions in the production and generation of income account to the non-financial corporations sector and the enterprise element of the households sector, is carried out downstream and partly by way of a model because of

the inadequacy of the source statistics. Table 4–1 below shows the production account and generation of income account by sector.

Table 4–1: Production account and generation of income account for domestic sectors

Year 2010 in EUR (billions)

Transactions, aggregates and account balances for the production and generation of income account	Total economy	Non-financial corporations	Financial corporations	General government	Households and non-profit institutions serving households
	S.1	S.11	S.12	S.13	S.14 / S.15
Output (at basic prices)	4 776.123	3 364.869	234.233	373.164	803.857
– Intermediate consumption	2 454.428	1 909.244	129.676	118.049	297.459
= Gross value added	2 321.695	1 455.625	104.557	255.115	506.398
– Consumption of fixed capital	459.725	262.857	8.051	56.610	132.207
= Net value added.....	1 861.970	1 192.768	96.506	198.505	374.191
+ Other subsidies on production.....	27.352	23.493	–	0.773	3.086
– Compensation of employees.....	1 281.963	836.062	62.031	203.528	180.342
– Other taxes on production.....	15.457	7.611	0.246	0.066	7.534
= Net operating surplus/mixed income	591.902	372.588	34.229	– 4.316	189.401

4.05 The conclusion to be drawn is that it is not currently possible to make a full calculation of GDP and GNI in the German national accounts using the income approach, because insufficient source data are available on the operating surplus or entrepreneurial income generated within the country. For this reason, the production and expenditure approaches are used to determine the level of GDP in Germany and how it develops.

4.1 Statistical framework

4.06 As explained in section 4.0, it is currently not possible to make a complete, original calculation of German GDP by applying the income approach. To apply an independent income approach, either direct figures on the operating surplus would have to be provided, or details of entrepreneurial income would need to be available that were in accordance with the concepts used in the national accounts, and/or could be derived from source statistics. This is not the case, however.

4.07 In conceptual terms, entrepreneurial income in the national accounts for some items does not correspond to net profit in enterprise annual accounts. While creditor protection – keyword: lowest value principle – plays a central role in German commercial law in determining profit, in the national accounts it is assumed that the actual depletion of material assets has to be subtracted when calculating income for the period. For this reason, consumption of fixed capital is not applied at purchasers' prices in the national accounts as it would be in business accounting, but instead at

replacement prices. In general, the national accounts meant taking a longer economic service life of fixed assets into consideration than for calculating tax depreciation, because they work on the basis of the actual economic life. In valuing inventories, too, the national accounts entail other concepts than those of business accounting. Output stocks are valued at basic prices for national accounts purposes and input stocks at replacement prices for use in production. So-called paper profits, which can arise in business accounting when the price of inventories rises, are eliminated in the national accounts by this means. Furthermore, extraordinary income (e.g. arising from the sale of parts of enterprises) and extraordinary losses (e.g. arising from special depreciation of acquired shareholdings or real estate) do not form part of entrepreneurial income in the national accounts. Direct comparison between commercial entrepreneurial income and the national accounts concepts is therefore not possible.

- 4.08 Despite the fact that the required information on entrepreneurial income is not available, regular checks are made on how the entrepreneurial income determined for the national accounts develop compared to other statistics that are based on business accounting. The main source used here is the annual company accounts statistics provided by the Deutsche Bundesbank, which cover the balance sheets of major German enterprises with a time lag of one year.³⁶ The corporation tax statistics (annual statistics) provided by the Federal Statistical Office are also taken into account. Besides the differences in concept, outlined above, between entrepreneurial income as shown in the national accounts and entrepreneurial income as shown on a business or tax balance sheet, the corporation tax statistics are of limited value because they only cover genuine corporations (limited liability companies (AG and GmbH) and cooperatives (Genossenschaften)). However, the corporations included in the national accounts also include quasi-corporations such as limited partnerships and general partnerships whose profits are not liable for corporation tax.
- 4.09 One part of the residually determined entrepreneurial income recorded in the national accounts belongs to the operating surplus generated within the country as a result of the income derived from the production process and the other part belongs to the property income receivable less payable in connection with business activities. The main source of property income receivable is income on bank deposits and other monetary investments, as well as dividends from shareholdings. Property income payable includes payments of interest in particular and, in the case of financial corporations, property income owed to policyholders based on insurance policies, but not dividends paid and withdrawals by enterprise owners. Dividends and withdrawals are a way of distributing entrepreneurial income.
- 4.10 Starting with the net operating surplus, the following entrepreneurial income results for the entire economy for the year 2010 (in EUR billions):

Net operating surplus	591.902
+ Property income, receivable.....	437.548
- Property income, payable	385.028
= Entrepreneurial income.....	644.422

Entrepreneurial income is calculated and stated for the national economy as a whole as well as for domestic sectors. These domestic sectors comprise financial and non-

³⁶ See also Deutsche Bundesbank: 'Ertragslage und Finanzierungsverhältnisse deutscher Unternehmen im Jahr 2010', in: monthly report for December 2011, pages 31–49, and: 'Ertragslage und Finanzierungsverhältnisse deutscher Unternehmen im Jahr 2013', in: monthly report for December 2014, pages 37–48.

financial corporations, the general government sector and households, including non-profit institutions serving households. Entrepreneurial income is an informative value for non-financial corporations in particular. These include limited liability companies (AG and GmbH) and cooperative societies, as well as the so-called 'quasi-corporations' (partnerships such as OHG, KG and GmbH & Co KG). By contrast, some peculiarities need to be mentioned in the case of the households sector. For example, the entrepreneurial income of individual companies and the self-employed – both being subsumed in the households sector – are stated inclusive of remuneration for the work of the company owner. Also, in accordance with the rules of ESA 2010, the entrepreneurial income generated by households includes, for example, imputed income from the private use of dwellings by the owner. Conceptually, the use of a dwelling by its owner is treated as a business activity (see Chapter 3.18). In terms of the entrepreneurial income of financial corporations, it should be remembered that special depreciations or speculative profits and losses are not taken into account in the national accounts, as these are deemed to be revaluation profits or losses, and therefore not part of entrepreneurial income. However, given that they are to be seen as financial transactions, they often play an important part in entrepreneurial income on business balance sheets, particularly for financial corporations.

4.2 Borderline cases

- 4.11 As operating surplus can only be calculated residually within the framework of the production approach, the borderline cases here correspond to those in the production approach (see Chapter 3.2).

4.3 Valuation

- 4.12 The figures for operating surplus and mixed income are determined residually, so no separate valuation is required. Information about calculations for the other gross value added components is provided in sections 4.7 et seq. of this chapter.

4.4 Transition from private accounting and administrative concepts to ESA 2010 national accounts concepts

- 4.13 As the figures for net operating surplus/mixed income are determined residually, there is no transition from the private accounting and administrative concepts to the national accounts concepts of ESA 2010. Chapter 3 of this method description contains details about the production approach method. Due to a lack of information, it is not possible to quantify the conceptual differences between the national accounts system and the company accounts statistics (a business accounting concept) (see section 4.1). Information about calculations for the other gross value added components is provided in sections 4.7 et seq.

4.5 The roles of direct and indirect estimation methods, benchmarks and extrapolations

- 4.14 The figures for compensation of employees, other production and import taxes and other subsidies are mainly calculated by direct estimation methods. As net operating

surplus/mixed income is determined residually, it is not required to use estimation methods in the income approach. Similarly to depreciation figures for business accounts, it is not possible to directly measure consumption of fixed capital for national accounts purposes. In fact, it is more of an imputed cost and is calculated within the framework of the assets accounts in accordance with certain established principles. The calculation of consumption of fixed capital is described in detail in Chapter 4.12.

- 4.15 Calculations for gross wages and salaries – which form a significant component of compensation of employees – are broken down by industry sector (two-digit heading level in line with WZ 2008). The average gross wages and salaries are multiplied by the corresponding number of employees for each industry sector. However, direct calculation of average earnings is not currently possible, as no detailed calculation principles are currently available. For this reason, benchmarks are defined for average gross wages and salaries at multi-annual intervals and as part of comprehensive national accounts revisions, and are then extrapolated using suitable statistical salary indicators. Chapter 4.7 of this method description goes into more detail about calculating gross wages and salaries.
- 4.16 By contrast, no benchmark extrapolation is required when calculating other production and import taxes, other subsidies and consumption of fixed capital. Operating surplus and/or entrepreneurial income are calculated residually.

4.6 The main approaches to achieving exhaustiveness

- 4.17 As already mentioned previously, gross wages and salaries (as a major component of compensation of employees) are basically determined by multiplying average earnings by the number of employees. All available statistical salary sources are used to calculate and/or define gross wages and salaries per employee (average earnings) in a certain industry, adjusted to fit the national accounts concepts where necessary and compared to one another in terms of informative value. Allowances are made for salary components not included in source data, particularly tips. Allowances based on special assessments are made for employee groups whose average earnings are not reflected at all or only in part in available source statistics. This particularly means disabled people in workshops, people performing Federal non-military service and priests/ church officials. The average gross wages and salaries for household services (activities of households as employers) are calculated using a model. When it comes to determining the average salary in the relevant industry, these calculations therefore cover the entire industry per se (see also Chapter 4.7).
- 4.18 Information on the level of coverage of the calculations therefore mainly focuses on the exhaustiveness of the employment account. Considering all industries together, the level of coverage for the employment account lies at almost 100%, based on source statistics. Substantial estimates in the employment account are obtained in particular for the construction and household services industries.
- 4.19 The method of residual calculation implies that the operating surplus so obtained is implicitly complete. No further explicit measures to achieve exhaustiveness are required when calculating other taxes on production and imports and other subsidies, or when calculating the consumption of fixed capital using the perpetual inventory method.

4.7 Compensation of employees

- 4.20 Compensation of employees is defined as the total remuneration, in cash or in kind, payable by an employer to an employee in return for work done by the latter. Employees are deemed to be manual workers, salaried workers, civil servants, soldiers, apprentices, trainees, marginal part-time workers, people performing voluntary national service, people performing voluntary non-military service (Federal voluntary non-military service³⁷, voluntary social year, voluntary ecological year), employees in Germany's 'one-euro jobs' part-time work programme and disabled people employed in recognised workshops. Compensation of employees comprises the gross wages and salaries, in cash or in kind, as well as the actual and imputed social security contributions paid by the employer.
- 4.21 According to the national concept (place of residence concept), compensation of employees consists of the remuneration earned by natives from domestic and foreign employers, while the domestic concept (workplace location concept) means that inward commuters to Germany are included and outward commuters are not taken into account. The difference between the national and domestic concepts is the balance of inward and outward commuters (commuter balance) across the borders of the relevant economic territory. Commuter balance is discussed in Chapter 8 of this inventory.
- 4.22 The two following tables show the gross wages and salaries, the actual and imputed social contributions by employers and compensation of employees in 2010, broken down by industry sector (Table 4–2) and institutional sector (Table 4–3). In the subdivision by industry, around 25% of compensation of employees (approx. EUR 319 billion) was related to manufacturing in 2010.

The imputed social contributions in Germany are calculated mainly for superannuation schemes (pensions and benefits), and hence they almost completely fall under sector S.13.

³⁷ The obligation to perform military service, and therefore also the alternative non-military service option, were abolished on 1 July 2011. However, people are able to volunteer for military service for a certain length of time, or perform Federal non-military service as an alternative, also for a set length of time.

Table 4–2: Gross wages and salaries, employers' social contributions and compensation of employees by industry in 2010 (domestic concept)

Year 2010 in EUR (billions)

WZ 2008 Industries	Gross wages and salaries	Employers' social contributions		Compensation of employees
		Actual	Imputed	
A Agriculture, forestry and fishing	5.076	0.962	0.057	6.095
B Mining and quarrying	2.924	1.036	0.000	3.960
C Manufacturing.....	258.746	60.173	0.542	319.461
D Electricity, gas, steam and air conditioning supply.....	12.456	3.399	0.022	15.877
E Water supply; sewerage, waste management and remediation activities .	7.975	1.570	0.034	9.579
F Construction.....	54.421	11.148	0.024	65.593
G Wholesale and retail trade; maintenance and repair of motor vehicles and motor cycles.....	124.121	23.389	0.130	147.640
H Transportation and storage	48.290	9.296	2.335	59.921
I Accomodation and food service activities	19.566	3.417	0.000	22.983
J Information and communication	43.907	8.796	1.214	53.917
K Financial and insurance activities	49.355	12.112	0.442	61.909
L Real estate activities	9.013	1.858	0.036	10.907
M Professional, scientific and technical activities	59.794	14.909	0.325	75.028
N Administrative and support service activities	41.682	7.928	0.016	49.626
O Public administration and defence; compulsory social security.....	88.193	12.841	18.204	119.238
P Education	66.992	8.645	11.190	86.827
Q Human health and social work activities .	101.209	19.771	0.212	121.192
R Arts, entertainment and recreation.....	10.283	2.287	0.226	12.796
S Other service activities.....	26.677	5.444	0.726	32.847
T Private Households as employers	6.425	0.142	0.000	6.567
All industries.....	1 037.105	209.123	35.735	1 281.963

Table 4–3: Gross wages and salaries, employers' social contributions and compensation of employees by institutional sector in 2010 (domestic concept)

Year 2010 in EUR (billions)

Institutional Sectors		Gross wages and salaries	Employers' social contributions		Compensation of employees
			Actual	Imputed	
S.1	Total economy	1 037.105	209.123	35.735	1 281.963
S.11, S.12, S.14	Non-financial and financial corporations, households	849.933	183.370	2.433	1 035.736
S.13	General government	152.390	18.554	32.584	203.528
S.15	Non-profit institutions serving households	34.782	7.199	0.718	42.699

4.23 **Gross wages and salaries** are the main component of compensation of employees. Amongst other things, gross wages and salaries in cash include:

- basic wages and salaries payable at regular intervals;
- allowances, such as payments for overtime, night work, weekend work, disagreeable or hazardous working conditions;
- additional monthly salaries, Christmas or New Year bonuses, performance bonuses, productivity bonuses, premiums or other special performance-related payments relating to the success of the enterprise;
- payments made by employers contributing to employees' saving schemes;
- allowances for travelling to and from work;
- commission, tips, etc.;
- holiday pay for public holidays and annual holidays.

Examples of gross wages and salaries in kind include:

- discounts in free or subsidised canteens or in the form of meal coupons;
- company cars or other durables provided for the personal use of employees;
- stock options and free shares issued to employees;
- products and services produced as part of the employer's production process, e.g. free road travel and free flights;
- loans to employees at reduced rates of interest;
- the provision of sports, recreation or holiday facilities for employees and their families.

By contrast, gross wages and salaries do not include the reimbursement of travel, separation and removal costs and representation expenditure accrued by employees in the performance of their professional activity. Such cases are considered to be enterprise intermediate consumption purchases. The same applies to meals and drinks provided as the result of extraordinary working conditions and accommodation services at the workplace that cannot be used by members of the employee's

household³⁸. These products and services also primarily serve to help the employer's production process, and therefore count as part of the intermediate consumption purchases. Social security benefits, e.g. in the form of child benefit or spouse benefits, are also not part of gross wages and salaries.

- 4.24 **Employers' social contributions** make up the value of claims for welfare benefits to which employees gain a claim on the basis of the actions taken and payments made by their employer. Employers' actual social security contributions consist of the payments made by employers, for the benefit of their employees, to social security and other employment-related social insurance schemes. This includes contributions to statutory pensions, statutory health insurance, statutory care insurance, statutory unemployment insurance and accident insurance, as well as employers' contributions to private pension schemes and private health insurance schemes.
- 4.25 Employers' imputed contributions represent the counterpart to other social insurance benefits paid directly by employers to their employees or former employees and other eligible persons without involving an insurance enterprise or autonomous pension fund, and without creating a special fund or segregated reserve for this purpose. As already mentioned, imputed social contributions in Germany are predominantly calculated for superannuation schemes (pensions and benefits).
- 4.26 As indicated above, compensation of employees is calculated as the sum of gross wages and salaries and employers' social contributions. Chapters 4.7.1 (Gross wages and salaries) and 4.7.2 (Employers' social contributions) go into detail about the calculation of components of compensation of employees. Special assessments are also discussed in this context, where they are required in terms of gross wages and salaries for individual industry sectors or groups of employees. Measures to ensure the exhaustiveness of accounts are also described in these sections.

4.7.1 Gross wages and salaries

- 4.27 Gross wages and salaries can be determined using two different accounting methods, namely the industry approach and the social contribution approach. The first method is based on information on average gross wages and salaries and the number of employees broken down into the individual industry sectors. The second global approach uses data about social contributions and/or the levels of remuneration that are subject to social insurance contributions as evidenced by the social security reporting procedures. The social contribution approach is used in particular to verify the development of the gross wages and salaries determined using the industry approach.

The two approaches are described in detail below, starting with the industry approach, followed by the social contribution approach.

³⁸ This includes site accommodation, for example.

The industry approach to determining gross wages and salaries

- 4.28 In this compilation approach, the gross wages and salaries are determined for the individual industries by multiplying the average gross wages and salaries³⁹ by the corresponding number of employees in the relevant industry .

$$\text{Gross wages and salaries per employee}_{\text{industry}} \times \text{Number of employees}_{\text{industry}} = \text{Gross wages and salaries}_{\text{industry}}$$

- 4.29 The industry sectors are basically broken down in line with the two-digit heading level used in the German classification by economic activity (WZ) 2008 and/or NACE Rev. 2. Employee information is also broken down in each industry by occupational status: civil servant, manual worker/salaried worker (excluding marginal part-time workers), marginal part-time workers and employees in Germany's 'one-euro jobs' part-time work programme, as well as people performing voluntary military service or Federal voluntary non-military service (including other voluntary services). Disabled people employed in workshops were also added as a separate employee group in calculations as part of the comprehensive 2014 revision of national accounts. The industry method ensures consistency between the figures for the number of employees and the gross wages and salaries. Furthermore, the information on average gross wages and salaries and numbers of employees, which may well originate from different sources, can be coordinated better with this approach than in the case of an aggregate estimate of the total wages and salaries figures for one industry sector.
- 4.30 Only the calculation of gross wages and salaries in the general government sector deviates from this general method, i.e. multiplying average gross wages and salaries by the corresponding number of employees: for general government, the compensation of employees is first determined on the basis of the cash and accounting results in the public budgets. The figures for gross wages and salaries are then found by subtracting the employers' social contributions from the compensation of employees. This method applies not only to the 'Public administration and defence; compulsory social security' industry sector, but also to all industry sectors in which government employees work, e.g. agriculture, healthcare and education.

Calculating average gross wages and salaries

- 4.31 The calculation of average gross wages and salaries is based on a wide variety of different data sources, with this information being put together to form an overall picture. The main source is enterprise information from monthly, quarterly and annual reports, as well as surveys carried out at multi-annual intervals. Source statistics data have to be adapted in part to the definition of gross wages and salaries in the national accounts. For example, the remuneration elements relevant to national accounts that result from special processing of the labour cost survey are included in calculations, although they are not salary components according to demarcation in the labour cost survey (e.g. redundancy payments). For industries with no or only limited enterprise reports, collective agreement documentation is used as the estimation basis for current salary development. The individual data sources are of varying significance to the overall result, depending on how current they are, their level of coverage and the type of information they contain.

³⁹ The given inventory uses the terms 'average gross wages and salaries', 'gross wages and salaries per employee' and 'average earnings' as synonyms. The meaning is always the gross wages and salaries per employee in the sense of the national accounts.

- 4.32 The average gross wages and salaries are calculated in a **two-stage procedure**: The first stage comprises calculating the baseline values for average gross salaries and wages for the individual industries and broken down into the aforementioned employee groups as part of comprehensive revisions of national accounts. In a second stage, these benchmarks are extrapolated quarterly using suitable indicators. It is impossible to calculate the average current gross wages and salaries directly, because normally there are no actual detailed current reliable figures available.

Determining baseline values

- 4.33 Baseline values for average gross wages and salaries were last revised as part of the comprehensive 2011 revision of national accounts. This revision was triggered by the introduction of WZ 2008 in German national accounts; the base year was 2008. The following source statistics were taken into account when reviewing and/or recalculating gross wages and salaries per employee in the 2011 major revision:
- 2008 labour cost survey (specially processed for national accounts purposes)⁴⁰ (EVAS 62411)
 - Previous national accounts results on average gross wages and salaries, converted to WZ 2008 with the aid of the employment statistics compiled by the Federal Employment Agency
 - Quarterly earnings survey (EVAS 62321)
 - Structural survey in the service sector (EVAS 47415)
 - Monthly reports on manufacturing, mining and quarrying (EVAS 42111); monthly reports on primary construction (EVAS 44111) and on electricity, gas and water supplies (EVAS 43111)
 - Year-based material from the Federal Employment Agency
- 4.34 The various statistical sources describe the economic situation in a particular industry with varying cut-off limits or definitions. This means that a decision must be made for each individual sector regarding which statistical basis is most suitable for determining the average gross wages and salaries. Carried out at two-digit heading level in line with WZ 2008 and for the manual and salaried workers group (excluding marginal part-time workers), a review of the available data sources indicated that the most suitable sources for determining new baseline values for manual and salaried workers (excluding marginal part-time workers) outside the general government sector are the results of the special processing of the 2008 labour cost survey and the results for gross wages and salaries per employee converted with the aid of employment statistics.⁴¹ Data from other source statistics have only flowed directly into accounts in a few cases and have otherwise mainly been used to verify results.
- 4.35 The introduction of WZ 2008 led, amongst other things, to a more marked differentiation of service industries and a change in the structure and/or composition of the various industries in comparison to the previous version, WZ 2003. The conversion that is carried out for several industries with the aid of employment

⁴⁰ The 2008 labour cost survey was specially processed to adapt the results on wages and salaries in these statistics to the classifications and concepts of the national accounts. The results of the next labour cost survey in 2012 came too late for the comprehensive 2014 revision of national accounts, which meant that they basically could not be used for this revision.

⁴¹ The year-based material from the Federal Employment Agency, for example, only records remuneration liable for the payment of social security contributions, meaning that wage and salary components above the contribution assessment ceiling must be added as estimates and model calculations are required.

statistics takes account of the fact that employees change to a different industry with their average gross wages and salaries, resulting in re-weighted gross wages and salaries in the relevant industries. However, this action is based on the premise that the gross wages and salaries per employee do not change significantly overall, as the new composition of individual industries basically has no effect on the macroeconomic result; if the average wages and salaries rise in one industry, they fall in another, all other things being equal.

- 4.36 As already mentioned, all available statistical sources were used and compared in order to determine new baseline values for average gross wages and salaries. Marginal information about the pay of employees in individual industry sectors was also used. The available information was used to define plausible average earnings for the two-digit heading level of WZ 2008 that were either based directly on source statistics (labour cost survey, converted national accounts values, service statistics in some individual cases) or calculated from a combination of different source values. Consideration was given at all times during this process to the cut-off limit for each statistic,⁴² the significance of part-time work in each industry, the average gross wages and salaries in similarly structured industries and the average earnings in an industry before the revision.
- 4.37 Before the comprehensive 2011 revision of national accounts, a standardised gross wage was used for the group of **marginal part-time workers**⁴³ throughout all industries, derived from studies by the *Institut für Sozialforschung und Gesellschaftspolitik* (ISG/Institute for Social Research and Social Policy). For the first time, the 2008 labour cost survey provided information about average gross wages and salaries for marginal part-time workers classified by industry, which was incorporated directly into the accounts. This made the presentation of the gross wages and salaries of marginal part-time workers more accurate.
- 4.38 For some wage elements, industries or groups of employees, the baseline values are determined via **special assessments**, because there is no reliable statistical information about the average gross wages and salaries.
- The gross wages and salaries for priests/ministers and church officials working for the Protestant and Catholic Churches – incorporated as civil servants into sector S.15 (non-profit institutions serving households) in national accounts – were revised as part of the 2011 revision of national accounts. As separate data are available about numbers for this group of employees, but there is no reliable information about their average wages and salaries, the baseline value was redefined on the basis of information from the *Pfarrerbesoldungsgesetz* (law pertaining to pay for priests/ministers), the *Bundesbesoldungsordnung* (Federal Salary Scale Regulation)⁴⁴ and the average gross wages and salaries used up until then.

⁴² The 2008 labour cost survey only recorded information about enterprises with 10 employees or more. The same applies in principle to the quarterly earnings survey, albeit only in terms of local units.

⁴³ Marginal part-time employment is regulated in Section 8 of the fourth book of the German Social Code (SGB IV). A position is deemed to be marginal part-time employment if the remuneration for this job regularly fails to exceed EUR 450 per month or working hours within one calendar year are limited to two months or 50 working days at most. The wage limit of EUR 450 has applied since 1 January 2015; it was previously EUR 400.

⁴⁴ The status of priests/ministers in Germany is similar to that of civil servants; their pay is linked to that of Federal civil servants.

- Figures for 'disabled people in recognised workshops or similar establishments' have not previously been included in the evaluation of employment statistics compiled by the Federal Employment Agency. As part of the revision of these statistics in 2014, disabled people in recognised workshops were added to the list of employees in line with the International Labour Organisation (ILO) concept on which the ESA definition of employees is also based. The revised results of the employment statistics were incorporated into the comprehensive 2014 revision of the employment account compiled by the Federal Statistical Office⁴⁵, so that compensation of employees also had to be calculated for this newly incorporated group of employees in national accounts. Determination of the average gross wages and salaries for these people is based on annual information compiled by the Federal Ministry of Labour and Social Affairs (*Bundesministerium für Arbeit und Soziales, BMAS*) on the development of monthly remuneration for disabled people in workshops, with a time lag of two years. A flat allowance is applied in national accounts calculations for income components that are paid unconditionally and irrespective of the work carried out, where these are of a social benefits nature. This allowance ensures that income components that are not compensation of employees and gross wages and salaries in the sense of the national accounts are not included, while also avoiding double counting. Workshops for disabled people are part of sector S.15 'Non-profit institutions serving households' and are classified as industry sector 88 (social work, not including care homes) within this sector.
- The average gross wages and salaries for people performing Federal voluntary non-military service are calculated on the basis of statutory regulations. These specify that people performing this service should receive a monthly allowance. Meals and, where necessary, accommodation are also provided. Corresponding cash compensation may also be provided as an alternative. On the basis of official information on the average monthly allowance and the daily cash compensation an average wage of 290 Euro per month is integrated into the calculations from the second half of 2011 onwards.⁴⁶ Federal voluntary non-military service is classified as part of sector S.15 "Non-profit institutions serving households".
- Information about the number of employees in Germany's 'one-euro jobs' part-time work programme is published by the Federal Employment Agency for the period as of 1 January 2005. Surveys conducted by the association of German cities (*Deutscher Städtetag*) are used for earlier reporting periods. Earnings for employees in Germany's 'one-euro jobs' part-time work programme are determined on the basis of the amount of compensation paid for additional expenses ("*Mehraufwandsentschädigung*") and recorded as part of compensation of employees. Unemployment benefit II ("*Arbeitslosengeld II*") also accruing to one-euro job employees are made independently of their employment as a government transfer and are not taken into account in the figures for compensation of employees.
- For industry T 'Household services', source values for average gross wages and salaries are also orientated towards the collective agreement for paid employment in private households. Calculation of compensation of employees

⁴⁵ The employment statistics are a fundamental basis for the employment accounts.

⁴⁶ The Federal voluntary non-military service was established in 2011. For that reason no wages and salaries have been compiled for the year 2010 (see also footnote 36).

for this industry is described in section 3.26 of this inventory, because household services output is measured on the basis of the compensation of employees paid to domestic paid staff.

- The gross wages and salaries in manufacturing can only be determined as an aggregate figure for the latest period. There are no current figures regarding the earnings or numbers of employees for the 20 industries within this sector. The aggregate figure can therefore only be sub-divided using the annual results of the monthly reports that become available later.
- Gross wages and salaries are also paid in the form of benefits in kind. Their value is basically included in the wages and salaries data in source statistics. However, in order to balance out any under-reporting of these elements of remuneration, estimates based on private consumption expenditure are used for subsidised meals in works canteens and benefits in kind from own production in the rail and air transport industry. Allowances are also made for 'non-cash benefits' for staff facilities and benefits in kind in agriculture and financial services. These are based on the results of the 2004 labour cost survey.⁴⁷ Stock options were determined for the first time on the basis of the results of the 2012 labour cost survey and rewritten/extrapolated with information on the development of share price-based remuneration elements for enterprises listed on the DAX and MDAX.
- Tips (gratuties) are estimated as part of the calculation of private consumption expenditure and recorded in the same amount as part of wages and salaries (see also Chapter 5.7).

Extrapolation of baseline values

4.39 The baseline values calculated in this way for the individual industries cannot be redefined in the same way for each reporting period, as most of the information required is not available timely. For this reason, the baseline values are extrapolated quarterly using current rates of change. The extrapolation indicators for this can be derived from the monthly reports on manufacturing, mining and quarrying, primary construction and electricity, gas and water supplies. Information is also taken from the index of nominal earnings and the results of the quarterly income survey, as well as information on collective agreement statistics compiled by the Federal Statistical Office (EVAS 62211) and from the Institute of Economic and Social Research (WSI), which runs a collective agreement archive. The Deutsche Bundesbank also calculates a pay index used as a benchmark and for verification. Multiple extrapolation indicators are available as alternatives for some industries. When defining the rates of change to be used for extrapolation in a certain industry sector, all available information is included and consideration is given to the informative value of the individual indicators. For example, methodological changes in source statistics that could temporarily limit the validity of the results (e.g. replenishing the reporting population, transition to a rolling sample basis) are taken into account when deciding whether to use an extrapolation indicator. The same applies to cut-off limits and similar factors that limit the representativeness of results. In such cases, either a different and more suitable indicator is used or, if this is not possible, a discretionary adjustment is made to the extrapolation indicator with all due consideration of all available information, e.g. to balance out or adjust an exaggeration in wages development on the basis of

⁴⁷ The use of some results from much earlier four-yearly labour cost surveys is based on the fact that this survey does not regularly include differentiation of wages and salaries in the form of benefits in kind; the survey generally only asks about overall figures.

cut-off limits⁴⁸ or implausible results. In the case of industries where only collective agreement information is available for the extrapolation of baseline values, it must be borne in mind that the development of real wages may deviate from the development of collective agreement figures. Where additional information is available for these industries, e.g. one-off payments not linked to collective agreements, this is incorporated into considerations.

4.40 Baseline values are extrapolated quarterly. Only provisional indicators can be used initially for extrapolation, as the quarterly results for compensation of employees must be available 45 days after the end of the reporting quarter (and calculations take a few days). These are the results after t+30 days for the quarterly earnings survey and nominal earnings index, with monthly reports only being available for two months at the time of calculation, meaning that the third month must be estimated. As part of the first revision of the relevant reporting quarter, the provisional indicators are replaced by final indicators, namely the results of the quarterly earnings survey and nominal earnings index after t+75 days and the monthly reports available in full for the reporting quarter, i.e. including the previously estimated month.⁴⁹

4.41 The average gross wages and salaries for **marginal part-time workers** ('mini-jobs') are extrapolated using the development of the income tax payable on marginal part-time jobs. Wage income tax is a suitable indicator, because it is imposed at a flat rate (2%) and develops in line with aggregate wages, meaning that progression effects play no part here.

The flat-rate income from wage income tax on 'mini-jobs' may change because:

- the number of marginal part-time workers increases or decreases;
- the average gross wages and salaries increase or decrease; or
- both factors have the same or opposite effect on gross wages and salaries overall, and therefore affect the flat-rate wage income tax.

4.42 The 'quantity effect', i.e. the tax revenue resulting solely from a change in the number of employees, must be deducted in order to extrapolate average gross wage and salaries. This is worked out by dividing the change in flat-rate tax by the change in the number of marginal part-time workers. This provides an indicator for the extrapolation of gross wages and salaries for marginal part-time workers. This calculation can only be carried out for the overall average gross wages and salaries for all marginal part-time workers. It can be divided proportionally amongst the industries.

4.43 The extrapolation method is not used for marginal part-time workers in the 'housing services' industry, as high allowances for hidden economy activities are included in the calculation of gross wages and salaries for this industry, meaning that people for whom no wage income tax is paid and the total wages paid to them may be included in the calculations.

⁴⁸ Experience has shown that pay is lower in smaller enterprises falling below the cut-off limit than in larger enterprises, at least in some industries. Cut-off limits may therefore lead to the exaggeration of wage development.

⁴⁹ Where collective agreement results are used for extrapolation, the question of provisional or final indicators is not relevant.

Determining the number of employees for the industry approach

- 4.44 Both the level and the development of gross wages and salaries are affected to a great extent by the results of the employment account.⁵⁰ The employment account provides information about the number of employees and self-employed people, including family workers. The definition of persons in employment follows the definitions of the labour force concept used by the International Labour Organisation (ILO) and ESA 2010.
- 4.45 The employment account embedded in the national accounts brings together the information available from various employment statistics sources to create an overall picture that is as free as possible from gaps and overlaps. Estimates may be required, particularly for current data, depending on how up to date and exhaustive the source data are, and these take into account all available sources and relevant information. The same facts are considered from various sides (administrative data, enterprise surveys, household and personal surveys), and their consistency is also checked using other economic indicators.
- 4.46 Around 60 different data sources are currently used for the employment account. These include the employment statistics compiled by the Federal Employment Agency, statistics compiled by the Minijob-Zentrale (mini-job centre) for the development of marginal part-time workers⁵¹, personnel statistics on public service personnel and the results of the microcensus. Using source statistics, the employment account covers almost 100% of all the industries. Significant allowances are made, particularly for the housing services and construction industry.

Adjustments for exhaustiveness

- 4.47 The **exhaustiveness of the calculation of compensation of employees** is ensured primarily by using the employment account data. As already mentioned, the use of a wide range of relevant data sources creates an overall employment statistics picture and provides an input for the compilation of wages and salaries in national accounts, which are broken down into employees by industry and occupational status.
- 4.48 The source statistics used to determine the baseline values for average gross wages and salaries mainly correspond to the concepts of ESA 2010. For example, the gross wages and salaries in the 2008 labour cost survey include special payments such as bonuses and additional monthly salaries, as well as tax-exempt allowances for night and Sunday work. Income components that are to be classified as wages and salaries according to the concepts of ESA 2010, but are not recorded in source statistics or not implicitly included in source figures, are added to gross wages and salaries. This particularly includes tips, with their volume being determined as part of the calculation of household consumption expenditure and recorded to the same amount as wages and salaries. Allowances are made for certain benefits in kind, in order to correct possible under-reporting of these remuneration elements in source statistics. As already mentioned elsewhere, allowances are also made for groups of people (disabled people in workshops, people performing Federal voluntary non-military service, priests and church officials) and industries (household services) not included

⁵⁰ For more information about the employment account compiled by the Federal Statistical Office, see (for example): Lücken, Stephan, 'Die deutsche Erwerbstätigenrechnung für Volkswirtschaftliche Gesamtrechnungen und Arbeitsmarktstatistik – Erfahrungen und Erkenntnisse aus sechs Jahrzehnten', in: *Wirtschaft und Statistik*, 5/2012, pp. 385–405.

⁵¹ The Minijob-Zentrale is the central entry and registration point for all marginal part-time workers. It is part of the Deutsche Rentenversicherung Knappschaft-Bahn-See association (pension scheme).

in source statistics. Any over- or under-reporting of average earnings in individual source statistics should be avoided by considering all statistical wage information for the relevant industry. The coherence of the compensation of employees is checked with other macroeconomic figures and indicators.

The social contribution approach to determining gross wages and salaries

4.49 The contribution approach uses the fact that it is possible to estimate the remuneration that is liable for pension contributions very near the actual date by means of information on the contributions paid into statutory pension insurance and the underlying proportional contribution rate. The remuneration that is liable for pension contributions is reconciled with the gross wages and salaries of manual and salaried workers (excluding marginal part-time workers) determined using the industry approach. Just under 90% of the gross wages and salaries in 2010 belonged to this group of employees. The contribution approach is used in particular to verify the development of the gross wages and salaries determined using the industry approach. However, a review of the level of macroeconomic wages and salaries is only possible to a limited extent. Although remuneration subject to social insurance contributions is the most significant component of gross wages and salaries, the latter also contain elements that are missing in the contribution approach:

- gross wages and salaries above the contribution assessment ceiling (of all employees liable for statutory pension contributions);
- gross wages and salaries of manual/salaried workers not liable for payment of statutory pension contributions (employees insured in professional pension funds, board members, marginal part-time workers);
- gross wages and salaries of civil servants;
- wage elements that are not liable for statutory pension contributions.

These items cannot be determined immediately, rather only with a considerable time lag and also with a high proportion of estimation. For this reason, such calculations going beyond the contribution approach in the narrower sense are not carried out regularly and are only carried out at longer intervals.

4.7.2. Employers' social contributions

4.50 The compensation of employees comprises the social contributions of employers along with gross wages and salaries. They are the element of social contributions payable by employers to social insurance schemes or other employment-related social insurance schemes to secure social benefits for their employees. Figure 4–1 shows the net social contributions⁵² of employers and households, as well as the households' social contribution supplements.

4.51 Of the account items shown in this Figure, only the actual and imputed social contributions of employers are discussed in more detail below, as the employees' social contributions (referred to in Figure 4–1 as part of households' social contributions) are part of gross wages and salaries.

⁵² Social contributions are recorded in ESA 2010 as net social contributions, i.e. social insurance scheme service charges (D.61SC) are deducted from gross social contributions, which correspond to the sum of employers' actual social contributions (D.611), employers' imputed social contributions (D.612), households' actual social contributions (D.613) and households' social contribution supplements (D.614).

- 4.52 **Employers' actual social contributions** are contributions made by employers to their employees in order to secure the entitlement of those employees to social benefits. Social contributions by employers also include **imputed social contributions**. These are the equivalent of social benefits (minus any employee contributions) paid by employers directly to their employee or any other beneficiary (such as surviving dependants) without requiring special reserves or payments to third parties. For example, employers' imputed social contributions are recorded for:
- General government: Pension contributions civil servants of the administrative units and social insurance scheme civil servants, plus benefits and income support.
 - Non-profit institutions serving households: Contributions for benefits to priests and other church officials, plus financial support in cases of illness for civil servants and other benefits
 - Corporations: Contributions to dependent benevolent funds, pension contributions for officials working for public quasi-corporations and public banks, including the Deutsche Bundesbank, plus financial support in cases of illness for civil servants.
- 4.53 In the National Accounts the social contributions by employers are recorded as paid to the employees who subsequently pass them to the social insurance systems, although in most cases the contributions are transferred by the employers to the social insurance institutions directly.
- 4.54 The employers' social contributions paid in 2010 amounted to EUR 244.858 billion, of which EUR 209.123 billion (85.4%) were actual contributions and EUR 35.735 billion (14.6%) were imputed contributions.
- 4.55 **Imputed contributions to civil servant pensions** are determined on the basis of an surcharge model. This surcharge is calculated using the current rate of contribution to the statutory pension insurance, the current rate of contribution to the supplementary benefits for public servants pension scheme and an allowance for future retired civil servants' financial support in case of illness benefits (based on current benefits figures for benefits recipients). This allowance rate is updated annually on the basis of current available data.
- 4.56 Households' actual contributions include contributions by self-employed people, such as contributions to pension schemes of the liberal professions, contributions by farmers and the family members who assist them to the agricultural pension insurance and voluntary contributions to private pensions, such as contributions to additional funded pension schemes.⁵³
- 4.57 When ESA 2010 was introduced, social contributions were recorded for the first time as net social contributions, i.e. adjusted for the service charge used to represent service fees (mainly administrative costs) for the units that manage the systems. These are deducted from investment income for funded private social insurance systems, so that the net social contributions only represent the counterpart to social contributions for which social benefits are available. The service charge is therefore not part of

⁵³ The "Riester" pension scheme is a government-subsidised additional private pension which was introduced in 2002 and is regulated in the Income Tax Act (§§ 10a, 79 et. seq. EStG). The "Rürup" pension scheme, also referred to as "Basis pension scheme", is a private pension that is associated with tax reductions and is designed primarily for self-employed persons. The corresponding legal regulations can be found in the Retirement Income Act (Alterseinkünftegesetz (AltEinkG)). The "Eichel" pension scheme is a company pension scheme in combination with tax reductions in the context of deferred compensation (see § 3 Nr. 63 EStG).

redistribution transactions, but instead part of output and final consumption expenditure. No service charge is recorded for statutory social insurance systems that are unfunded except for fluctuation reserves, as there is no investment income for these that could be used to finance the service charge.

Figure 4-1: Net social contributions

D.61 Net social contributions				
Employers' social contributions	D.611 Employers' actual social contributions		D.613 Households' actual social contributions	
	D.6111 ... to pensions	D.6112 ... not including pension contributions	D.6131 ... to pensions	D.6132 ... not including pension contributions
	D.611c Employers' actual compulsory social contributions		D.613c Households' actual compulsory social contributions	
	<ul style="list-style-type: none"> • Contributions to statutory pension insurance, statutory health and accident insurance, unemployment insurance and to private health and care insurance • Contributions to staff pension institutions/funds, pension funds and direct insurances funds • Allocations to provisions for occupational pension schemes (direct commitments/promises) • Contributions to the pension schemes of the liberal professions and the supplementary benefits for public servants pension scheme Contributions to professional pension funds and civil-service supplementary pension schemes where defined as compulsory through law or collective agreement 		<ul style="list-style-type: none"> • D613ce Employees' actual compulsory social contributions <ul style="list-style-type: none"> – Contributions of households, especially those to social insurance, funded equally by both sides. – Additional contributions paid exclusively by the employee for health insurance, as well as the surcharge paid by the childless in care insurance, but not contributions paid exclusively by the employer, such as accident insurance, those for marginal part-time workers or retrospective contributions for former civil servants. • D613cs Self-employed persons' actual compulsory social contributions • D613cn Unemployed persons' actual compulsory social contributions 	
	D.611v Employers' actual voluntary social contributions		D.613v Households' actual voluntary contributions	
	As above, but voluntary, e.g. in the context of enterprise agreements.		<ul style="list-style-type: none"> • Additional funded pension schemes (Riester savings plans, direct insurance with Rürup support, staff pension institutions/funds/pension with Eichel support)⁵² • Voluntary additional health/care insurance 	
D.612 Employers' imputed social contributions		D.614 Households' social contribution supplements		
D.6121 ... to pensions	D.6122 ... not including pension contributions	Income from funded systems (private health insurance and care insurance, staff pension institutions, etc.); these are recorded in turn as households' social contributions.		
Fictitious contributions for benefits, such as civil servant pensions, financial support in cases of illness for civil servants/benefits payments or occupational pensions, paid directly by an employer to current or former employees or their families/surviving dependants.				
+ D.61SC Private social insurance scheme service charges				
Administrative costs paid by households for these schemes. Service charges are only recorded for private social insurance systems in the German national				
= Social contributions (including service charges)				

4.7.2.1 Employers' actual social contributions

- 4.58 Employers' actual social contributions cover their payments to statutory and private social insurance schemes. Actual social contributions can be made on the basis of statutory or collective agreement obligations or on a voluntary basis (see also Figure 4-1). Compulsory contributions include those made by employers to statutory social insurance schemes and to private health and care insurance. Voluntary social contributions are also made, e.g. as part of supplementary funded employee pensions.
- 4.59 Employers' actual social contributions in 2010 amounted to EUR 209.123 billion. Table 4-4 shows the scope of employers' contributions by type of social insurance system. This table also shows the scope of employees' social contributions and other contributions, including compulsory contributions by self-employed people, general government contributions for social benefits recipients and contributions made by the social benefits recipients themselves. In line with the requirements of ESA 2010, there is also differentiation between whether social contributions are made for pensions or other social objectives. Contributions to statutory pension insurance and occupational or private pension schemes are added to pension contributions. Contributions to health, care, unemployment and accident insurance are counted as social contributions excluding pension contributions.

Table 4-4: Employers' actual social contributions (D.611)
Year 2010 in EUR (billions)

Actual social contributions	Employers' contributions	Employees' contributions	Other contributions
Pension contributions			
Statutory pension insurance	82.669	77.933	11.732
Agricultural pension schemes	0.000	0.000	0.641
Occupational pension schemes ⁵⁴	39.213	3.435	0.000
Additional funded pension schemes and pension schemes of the liberal professions ⁵⁵	0.658	15.338	8.394
Not including pension contributions			
Statutory health insurance	52.171	57.397	50.256
Statutory care insurance	6.892	7.444	6.936
Statutory unemployment insurance	14.152	11.202	0.308
Statutory accident insurance	9.969	0.000	1.234
Private health and care insurance	2.282	6.457	14.835
Balance of cross-border commuters	1.117	1.087	0.000
Total (domestic concept)	209.123	180.293	94.336

⁵⁴ Occupational pension schemes include social contributions via direct promises, direct insurance, staff pension funds, pension funds and contributions to the supplementary benefits for public servants pension schemes

⁵⁵ The additional funded pension schemes for employees include contributions based on agreements with deferred compensation and Riester agreements, (funded and state-subsidized private pension), as well as contributions to pension schemes for the liberal professions. Other contributions include contributions by self-employed people to professional pension schemes, as well as contributions to insurers with agreements for the so-called basic pensions, also known as Rürup pensions. (tax-privileged private pension).

- 4.60 Original statistics from social insurance schemes are used as the **data source** for contributions to statutory social insurance schemes. Data from the German Mutual Pension Insurance Association (PSVaG) for direct promises by enterprises and information from the Federal Financial Supervisory Authority (BaFin) for other occupational funds and staff pension funds are used for occupational pension schemes. BaFin data and a study published multi-annually by TNS Infratest Sozialforschung are used as source data for contributions via other methods for occupational pensions that are not secured by PSVaG. In terms of the additional private pension scheme sector (Riester pensions, Rürup pensions, direct insurance), the main source of information is the German Insurance Association (Gesamtverband der Deutschen Versicherungswirtschaft e.V.). Data from the Versorgungsanstalt des Bundes und der Länder (VBL) are used for public service employees subject to collective agreements. Contributions to private health and care insurance are determined with the aid of figures from the Verband der privaten Krankenversicherung e.V. (Private Health Insurance Association). Alongside these regularly used data sources, data are also available from the labour cost survey carried out by the Federal Statistical Office, used to verify the data series.
- 4.61 ESA 2010 classifies social contributions not by social insurance scheme institution (apart from differentiating between pension schemes and schemes serving other social objectives), but by **groups of contributors**. They are divided into social contributions by employers, employees, self-employed people and unemployed people. Additional contributions are made to social insurance schemes from household investment income that may be generated by funded schemes. Investment income from pension schemes that accrues for and is generally retained by scheme managers is classified as 'households' social contribution supplements' (D.614).
- 4.62 The allocation of social contributions to the groups of payers for statutory social insurance schemes is in line with the rules on the distribution of payment of the contributions. The data sources provide information broken down into great detail in this regard. Contributions are generally distributed half and half between employers and employees with equal financing; the employee is solely responsible for bearing any additional contribution costs charged by the health insurance fund for statutory health insurance, and the proportional rate of contribution for childless employees rises by 0.25% for care insurance.
- 4.63 For private social insurance schemes, contributions are divided by contributor group in line with actual circumstances. For example, provisions for occupational pension schemes are mainly financed by employers' contributions, while contributions to additional private pension schemes (deferred compensation, Riester pension) are almost exclusively made by employees. As no source data are available here, distribution is carried out via model calculations based on studies and other sources.
- 4.64 In line with ESA 2010, contribution receipts of the pension schemes are to be recorded at the time when the activity took place to generate the liability to pay a contribution. Time adjustment is generally required here, corresponding to the average time lag between the time when the activity took place and the contribution receipt. Since 2006, the preferred date of handover of contributions to statutory social insurance schemes by the employer has been the end of the previous month, so that they can be assigned to the correct period in national accounts. Figure 4–2 uses the example of statutory pension insurance to illustrate the calculation of employer and employee social contributions for the statutory social insurance scheme:

Figure 4–2: Determining statutory social insurance contributions in the payroll deductions procedure

Row	Calculation process using statutory pension insurance as an example
(1)	<i>Monthly reports from the German Association of Pension Insurance (Deutscher Rentenversicherung Bund) recording actual contributions (compulsory contributions) for the collection offices (health insurance funds)</i>
(2)	– <i>Contributions paid only by the employer (e.g. for marginally employed persons, for people performing military and alternative civilian service, retrospective contributions paid for civil servants and regular soldiers, contributions for employees in short-term work)</i>
(3)	– <i>Contributions not involving the employer (e.g. contributions to artists' social insurance, compulsory contributions by self-employed craftspeople, insolvency support benefits, general government contributions for disabled people in workshops)</i>
(4)	= <i>Compulsory contributions retained within the payroll deductions procedure and paid by employee and employer in equal shares</i>

- 4.65 The entire social contributions of the employer to statutory pension insurance comprise half the compulsory contributions within the payroll deductions procedure (4) and the contributions paid only by the employer (2).
- 4.66 The calculation of employers' social contributions for **occupational pension schemes** deviates from the diagram above. Direct promises are particularly important here, as one of five methods for contributing to occupational pension schemes. The other methods are support funds, direct insurance, staff pension funds and pension funds. With the exception of support funds, social contributions to occupational pensions schemes are recorded as actual social contributions (see Table 4–4), whereas contributions to support funds are considered to be imputed social contributions (see section 4.7.2.2).
- 4.67 Occupational pensions from direct promises, support funds and pension funds are secured by the German Mutual Pension Insurance Association (PSVaG) in the event that the employer becomes insolvent. This association pledges to pay out current non-forfeitable occupational pensions on behalf of the employer. The PSVaG is the most important data source for direct promises and support funds, while data compiled by the Federal Financial Supervisory Authority (BaFin) are used for direct insurance, staff pension funds and pension funds.
- 4.68 In quantitative terms, **direct promises** remain the most significant form, representing over 50% of the volume of occupational pension schemes in Germany (insurance commitments to active employees and pensioners). The direct promises is the only direct method for an enterprise to build up provisions in its balance sheets for the insurance obligations into which it has entered. These provisions are then liquidated progressively when benefits are to be paid out. The amount of employers' social contributions entered in the national accounts that flow to employee households (households sector) as compensation of employees (labour costs), is recorded as the same amount as the current provisions allocated, being posted back from there in the same amount as social contributions paid by households to enterprises.
- 4.69 Direct promises do not involve any direct information about the amount of current pension provisions. Employers' social contributions can be determined as the sum of the **change in occupational pension rights** and **occupational pension benefits paid**:
- Data on the **change in occupational pension rights**, also known as net allocations, are found in the direct pension promises reported by the PSVaG.

The change in pension rights is determined by comparing the figures for the start and end of the year, whereby insolvencies must also be taken into account. Yearbooks and/or annual reports and the Deutsche Bundesbank's internal information are used as a source of data for enterprises and institutions not subject to mandatory insurance with PSVaG, because they cannot go bankrupt or because regional authorities cover the risk of insolvency (e.g. public radio and television stations, savings banks).

- The **occupational pension benefits paid** are derived from PSVaG data regarding the net present values of accrued pension rights and the net present values of current pension benefits for the current year. This data covers all values for all insured enterprises in an industry at year-end. However, in order to use these data to determine the occupational pension benefits paid, a calculation model is used to implement the actuarial calculations of the net present value in the opposite direction. The actuarial interest rate required here, previously standardised by Section 6a of the Income Tax Act, has had to be estimated for the model since 2010, because a certain flexibility was built into the selection of assumptions used by enterprises to measure pension provisions after the Accounting Law Modernisation Act (BilMoG) was introduced.

- 4.70 Alongside the direct route for employers to commit to the provision of occupational pension benefits in the form of a direct promise, there is also the option for them to pay contributions on behalf of their employees to legally independent pension schemes (indirect contributions).
- 4.71 BaFin data is used for **direct insurance, staff pension funds and pension funds**. This includes aggregated enterprise data on contributions income and occupational pension benefits paid by insurance companies, forming the data basis for employers' social contributions and benefits paid (occupational pension benefits paid out). While staff pension funds and pension funds are fully part of the occupational pension schemes sector, social contributions to direct insurance must be separated from the general business of insurance companies, which also includes life insurance. This is carried out on the basis of data from the German Insurance Association.

Figure 4–3 provides an overview of the databases and those responsible for contribution payments to the specified schemes, as well as the other social insurance schemes listed in Table 4–4:

Figure 4–3: Data sources and calculation principles for employers' actual social contributions

The following information relates to employers' actual social contributions.

Statutory pension insurance

Data source	Information from the German Association of Pension Insurance.
Responsibility for payment of contribution:	The employer basically pays half the rate of contribution; the employer alone pays the higher additional contribution for the minders' pension insurance. No contributions for voluntary policy holders; the employer alone pays a flat-rate contribution for marginal part-time workers. The employer pays all social contributions for participants in Federal voluntary non-military service.

Statutory health insurance	
Data source	Information from the Federal Ministry of Health.
Responsibility for payment of contribution:	The employer pays half the general rate of contribution since 2015, contribution potential supplementary contribution is borne by the employee alone. The employer pays a flat-rate contribution to statutory health insurance for marginally employed persons, and is also solely responsible for paying contributions for participants in Federal voluntary non-military service and recipients of insolvency support benefits.
Statutory care insurance	
Data source:	Information from the Federal Ministry of Health.
Responsibility for payment of contribution:	The employer basically pays half the rate of contribution, but pays the entire contribution for participants in Federal voluntary non-military service and recipients of insolvency support benefits. No contributions are payable for marginally employed persons.
Statutory unemployment insurance	
Data source:	Information from the Federal Employment Agency.
Responsibility for payment of contribution:	The employer basically pays half the rate of contribution, but pays the entire contribution for participants in Federal voluntary non-military service and recipients of insolvency support benefits. No contributions are payable for marginally employed persons.
Statutory accident insurance	
Data source:	Information from the Federal Ministry of Health and employers' liability insurance funds.
Responsibility for payment of contribution:	The employer pays all contributions.
Private health insurance; private care insurance	
Data source:	Annual reports from the Private Health Insurance Association.
Responsibility for payment of contribution:	For salaried workers, the employer pays half of the contributions in the form of an allowance up to the maximum sum specified for contribution to statutory health insurance. The contribution amount is taken from data provided by the Private Health Insurance Association.
Direct promises (occupational pension scheme)	
Data source:	Contributions based on information from the PSVaG and additional sources (public broadcasting institutions etc.).
Responsibility for payment of contribution:	Employer contributions only.

Direct insurance (occupational pension scheme)	
Data source:	Information from the German Insurance Association (total contributions, administrative cost ratio to determine service charge, determination of investment income via a model calculation), as well as data from TNS Infratest Sozialforschung.
Responsibility for payment of contribution:	Division between social contributions payable by the employer and employee, based on the available data.
Staff pension funds; pension funds (both occupational pension schemes)	
Data source:	BaFin information.
Responsibility for payment of contribution:	Division between social contributions payable by the employer and employee using a model calculation; only employer contributions are recorded for pension funds.
Pension schemes of the liberal professions	
Data source:	Information from the Arbeitsgemeinschaft der berufsständischen Versorgungswerke (ABV e.V.) and the 'social budget' of the Federal Ministry of Labour and Social Affairs.
Responsibility for payment of contribution:	Total contributions to pension schemes of the liberal professions provided by the ABV statistics are divided amongst contribution groups in line with the social budget data.
Supplementary benefits for public servants pension schemes	
Data source:	Monthly reports from the Versorgungsanstalt des Bundes und der Länder (VBL), information from church and local authority pension schemes, information from Knappschaft-Bahn-See, a social security insurance authority.
Responsibility for payment of contribution:	Division between employer and employee contributions in line with contribution rates broken down by scheme.

4.72 In addition to the social insurance schemes listed above in Figure 4–3, for which employers' actual social contributions are recorded, social insurance schemes that consist solely of employee contributions and/or other contributions are also recorded in national accounts. The employee contributions category includes contributions to additional funded pensions. The latter includes deferred compensation, based on information from staff pension funds, pension funds and direct insurance, and the proportion of such deferred compensation in terms of total contributions is determined using a model calculation on the basis of information from TNS Infratest. Riester pensions are also part of funded pensions, with their contributions being based on information from BMAS, GDV and the Bundesbank. Information about the contributions to basic pensions (Rürup pensions) recorded as other contributions also comes from GDV. The other contributions are mainly contributions by self-employed people. These include contributions to agricultural pension funds. The data published for these are based on social security for agriculture, healthcare and education. Contributions made by independent farmers and the family members assisting them are recorded.

4.7.2.2 Employers' imputed social contributions

- 4.73 Employers' imputed social contributions cover the social benefits promised directly by an employer to its employees, i.e. those not financed and delivered by employers' contributions to an insurance enterprise or other provider of social benefits and for which no reserves have been created. The imputed social contributions are calculated as the counterpart to the increase in social benefits based on employment during the reporting period, less any actual employer and employee contributions, plus the service charge.
- 4.74 Pension contributions for civil servants make up the largest part of imputed employers' social contributions, as well as benefits and income support to civil servants. The amount of imputed social contributions is determined by multiplying the gross wages and salaries of civil servants by a corresponding allowance rate intended to cover the expected pension expenditure and benefits for benefits recipients. This allowance rate is recalculated every year and is based on the current rate of contribution to statutory pension insurance, the weighted rate of contribution ⁵⁶ for the Versorgungsanstalt des Bundes und der Länder (VBL) and the ratio of current benefits expenditure for financial support in cases of illness for currently retired civil servants to the gross wages and salaries of active civil servants.
- 4.75 The allowance rate determined in this way is used when calculating imputed social contributions for civil servants working for the authorities (government, state and local authorities) The same process is used for non-profit institutions serving households (mainly church officials) and the officials working for Deutsche Bahn AG.⁵⁷ For the social security sector, imputed social contributions correspond to the actual social benefits (pensions, benefits) paid to civil servants in line with the social insurance scheme accounts.
- 4.76 The imputed social contributions for financial support in cases of illness for active employees are determined for local authority civil servants on the basis of actual expenditure for those benefits in the current year. The same applies to officials working for non-profit institutions serving households and railway officials. The relevant source for federal government and state civil servants is the financial statistics and a proportional share of benefits volumes is estimated for local authority civil servants. For the social security sector imputed social contributions are determined by actual social benefits to civil servants (pension expenditures, financial support in cases of illness) as shown by the accounts of the social insurance schemes.
- 4.77 Alongside pensions and benefits for civil servants, contributions to *support funds* are also part of employers' imputed social contributions. This involves the non-financial

⁵⁶ The employers' rates of contribution to the VBL are sub-divided between the unfunded Abrechnungsverband West (settlement group), with a contribution rate of 7.86 % (2010), and Abrechnungsverband Ost, which uses a funded scheme plus an additional contribution rate with a total rate of contribution of 5% (2010). The average weighted rate of contribution is determined on the basis of the number of active policy holders in the relevant settlement groups, amounting to 7.29% in 2010.

⁵⁷ In the case of railway officials who are assigned to work for Deutsche Bahn AG (German Railways) and whose employer is the special railway fund (Eisenbahn-Sondervermögen, general government sector), the national accounts show the paid compensation of employees including the imputed social contributions of the employers (non-financial corporations (Deutsche Bahn AG)) as well as and subsidies to Deutsche Bahn AG as the amount of the difference between the recorded compensation of employees and the actual reimbursements by Deutsche Bahn AG to the special fund. The imputed social contributions for civil servants at Deutsche Bahn AG flow back to the general government in the national accounts, which then bears the expense of pensions for railway officials.

corporations sector, except for Deutsche Bahn and Deutsche Post. The reason for this is that the employer is still responsible for paying out the benefits to which it has committed for occupational pensions financed via support funds, even if this is not carried out directly by the employer. However, in contrast to direct promises, which also hold the employer responsible for ensuring the payment of benefits, no provisions are built up with support funds. The sponsoring undertaking also does not build up full entitlement financing, particularly for support funds with flat-rate endowment, meaning that contributions to support funds are recorded as imputed social contributions in line with paragraph 4.97 of ESA 2010.

- 4.78 These imputed employers' social contributions are recorded as the amount of payments made by enterprises to the support funds. Given the lack of information, it is assumed that the occupational pension payments made (social benefits) correspond to the amount of contributions and information on this is supported by PSVaG data material. Table 4–5 shows the amount of employers' imputed social contributions to support funds, as well as imputed social contributions for the civil servants pension scheme and the financial support in cases of illness for civil servants.

Table 4–5: Employers' imputed social contributions (D.612)

Year 2010 in EUR (billions)

Imputed social contributions	Employers' contributions
Pension contributions	
Civil servants pension scheme	27.157
Support funds (occupational pension scheme)	1.529
Not including pension contributions	
Financial support in cases of illness for civil servants	7.049
Total (domestic concept)	35.735

4.8 Other taxes on production

- 4.79 Other taxes on production include taxes 'A' and 'B' on real estate⁵⁸, road tax and administrative charges payable by enterprises, revenue from lotteries, football pools and the like, which is similar to a tax, and under-compensation for VAT⁵⁹. Trade tax, which was still considered part of other production and import taxes in the 2005 method report, is no longer part of this sector. At the time, it was stated that 'as over recent years local trade tax has developed more and more from a traditional cost-

⁵⁸ Real property tax A (agriculture) is charged for agricultural and forestry land. Real property tax B (construction) applies to building sites.

⁵⁹ ESA 2010 basically specifies that VAT should be recorded net, i.e. intermediate consumption is to be recorded excluding paid VAT, as producers are usually granted the right to pre-deduction for VAT. In the agricultural sector, the special fiscal regulations of the VAT consolidation system often apply. The farmers subjected to this system would be guaranteed lump-sum compensation for the deductible VAT they are charged. However, as this compensation can never exactly cover the amount that the farmer has actually paid, over- or under-compensation will occur. Under-compensation is recorded in the national accounts under other production and import taxes, while over-compensation is considered part of other subsidies.

related tax into an earnings-related tax, it could become necessary for a reallocation to be made in the national accounts once this tax has found its final form.' Once trade tax was reformed in 2008 and the criteria for earnings-related tax came to predominate, the decision was made to convert it to income and wealth tax as part of the following 2011 major revision.

Table 4–6: Tax revenue by tax type
Year 2010 in EUR (billions)

Type of tax	
Real property tax A	0.361
Real property tax B	10.952
Motor vehicle tax payable by enterprises	1.944
Administrative charges payable by enterprises	0.058
Revenues similar to taxes.....	1.432
Under-compensation of VAT.....	0.320
Emission rights	0.390
Other taxes on production.....	15.457

- 4.80 The other taxes on production are payable to general government out of net value added (at basic prices), while those payable to the rest of the world are currently unknown. As Table 4–6 shows, real property tax B is currently the most important tax type. The data sources for other taxes on production are the data on income as recorded in the public finance statistics. As corresponding legislation does not specify any time adjustment for payments, time adjustment of the cash figures on the basis of the accruals principle is not required within the framework of national accounts.
- 4.81 Administrative charges are then included as part of taxes on production rather than as part of the intermediate consumption purchases of enterprises, if the charges specified 'are not related to the costs of those verifications conducted by the general government'. As part of the conversion of the national accounts system to ESA 1995, all public areas of activity that involve revenue in the form of fees have been checked and allocations have been made to taxes on production and to intermediate consumption items. The differentiations made at the time for fees also comply with ESA 2010, as the relevant recording regulations have not changed. The amount of VAT under-compensation to be included under other taxes on production is taken from the national accounts for agriculture and forestry. No source information is available for the allocation of other taxes on production to corporations or to individual enterprises included in the households sector. Division into the two sectors is carried out on the basis of model calculations used for real property tax and motor vehicle tax.

4.9 Other subsidies on production

- 4.82 In 2010, the general government paid out EUR 29.666 billion in subsidies, of which EUR 7.898 billion were subsidies on products:

Table 4–7: Subsidies by subsidy provider and type

Year 2010 in EUR (billions)

Subsidy provider	Subsidies on products	Other subsidies on production
Country.....	7.898	21.768
Federal government	1.342	9.010
Länder (Federal state governments)	4.474	6.734
Local governments	2.082	3.492
Social security.....	0	2.532

General government subsidies on products have already been discussed in Chapter 3.29, so this section deals primarily with other subsidies on production.

- 4.83 Data on other subsidies on production for central government are obtained from the central government budget and for state and local government from public finance statistics.
- 4.84 As for subsidies on products, each central government budget item relating to other subsidies is checked and all those to be classified as other subsidies on production in line with Paragraph 4.36 of ESA 2010 (e.g. subsidies on payroll or workforce, subsidies to reduce pollution, grants for interest relief) are classified accordingly.
- 4.85 In the case of subsidies paid by state and local government, the large number of public budgets does not allow for the same method to be used. Subsidies on products are defined first (see Chapter 3.29) and then all other subsidies, including grants for interest relief of subsidies to cover producer losses, are recorded as other subsidies in line with section 4.36 of ESA 2010.
- 4.86 In the case of social security, expenditure for certain Federal Employment Agency budget items is classified as other subsidies on production. These are contribution reimbursements for short-time working allowance and subsidies for staff costs relating to the reintegration of the long-term unemployed. The job creation measures mentioned specifically in the 2005 method report only play a subordinate role now.
- 4.87 Other subsidies on production are recorded in compliance with ESA 2010 Paragraph 4.39 when the transaction or the event (production, sale, import, etc.) which gives rise to the other subsidy on production occurs. This includes any subsidies that the general government pays to public enterprises so that the latter can cover their losses.

4.10 Gross operating surplus

- 4.88 Gross operating surplus is determined residually in the German national accounts. This applies both to calculations by area of economic activity and by sector. In the households sector, there is a distinction between the (gross) income of the self-

employed and the gross operating surplus. Only gross operating surplus applies in all other sectors.

- 4.89 Market producers that are unincorporated enterprises – provided they are not quasi-corporations – are also included in the households sector. In Germany, these include sole proprietorships, the self-employed, self-employed farmers and forms of cooperation below the status of a partnership, such as civil law associations and collectives such as doctors', lawyers' and architects' practices or similar. In these legal forms of enterprise, their business transactions cannot be separated – at least not entirely – from the other transactions of their proprietors. The services of paid domestic employees (household services) and the letting of accommodation by households also belong to the households sector. The households sector (S.14) also includes non-profit institutions serving households (S.15), as separate recording of the distributive transactions of the two sectors is currently not possible.
- 4.90 The gross operating surplus of the households sector comprises the gross operating surplus arising from owner-occupation of dwellings. The calculations on owner-occupation of dwellings use the stratification method (see section 3.18.2). The gross operating surplus of the non-profit institutions serving households sector is added to this. The macroeconomic gross operating surplus therefore consists of the gross operating surplus of the households sector and that of the non-financial and financial corporations sector and of general government.

4.11 Mixed income

- 4.91 As with the operating surplus, mixed income is also calculated residually in the German national accounts, while only occurring in the households sector. The delimitation of the household sector is described in section 4.10. Mixed income includes non-market production for own use in the form of agricultural production in domestic gardens and own-account building work. Market production by market producers that are unincorporated enterprises is added to this, provided they are not quasi-corporations. In Germany, these include sole proprietorships, the self-employed, self-employed farmers and forms of cooperation below the status of a partnership, such as civil law associations and collectives such as doctors', lawyers' and architects' practices or similar. The services of paid domestic employees (household services) and the letting of accommodation by households are also components of mixed income.

4.12 Consumption of fixed capital

4.12.1 Overview

- 4.92 Consumption of fixed capital (P51.c) represents the amount of fixed assets used up, during the period under consideration, as a result of normal wear and tear and foreseeable obsolescence, including a provision for losses as a result of insurable accidental damage. In 2010, the consumption of fixed capital amounted to EUR 459.725 billion, representing 17.5% of gross national income.
- 4.93 As in business accounting, consumption of fixed capital is not directly measurable in the national accounts either. In fact, it is more of an imputed cost and is calculated within the framework of the capital stock estimations in accordance with certain established principles. The amount of consumption of fixed capital depends on:

- a) the precise definition of the fixed capital in question;
- b) the way in which the stock of fixed capital is assessed;
- c) the estimated service life of the specific type of consumable fixed capital;
- d) the selected depreciation method;
- e) the valuation method.

In all points the calculation of consumption of fixed capital in Germany follows the recommendations of ESA 2010.

Re a):

Consumption of fixed capital in the national accounts applies to the entire **fixed assets**, in other words both to tangible fixed assets and to intellectual property products such as research and development, entertainment, literary or artistic originals, mineral exploration and evaluation and computer software and databases. By definition, livestock are excluded. Land improvements and costs of ownership transfer on land are included as part of buildings and structures, in line with the description in Annex 7.1 of ESA 2010.

Table 4–8: Consumption of fixed capital by fixed asset type
Year 2010 in EUR (billions)

Buildings and structures	209.785
Machinery and equipment, including military weapons systems.....	169.763
Other capital formation (intellectual property products and tree crop and plant resources yielding repeat products ⁶⁰)	80.177
Total consumption of fixed capital	459.725

Re b):

As no comprehensive direct data is available on the stock of fixed assets in Germany, it is assessed by means of the **perpetual inventory method (PIM)**. This approach is based on the assumption that today's stock of fixed assets is composed of assets that were added to the stock at some time in the past. Taking into account the service life of fixed assets, we can calculate the percentage of assets added in past years that are still operational in the stock at the start of the year under consideration, as well as determine the time when these assets will be retired from the stock. If the depreciation method is applied, we can use this information to derive data on consumption of fixed capital for every reporting period. The use of the perpetual inventory method requires the following conditions to be fulfilled: (1) data series on gross fixed capital formation are available, which reach far back into the past, and (2) it is possible to estimate the average service life for the various types of fixed assets.

⁶⁰ Consumption of fixed capital for tree, crop and plant resources yielding repeat products is not determined using the perpetual inventory method described here; instead, it is calculated as part of the direct determination of stocks, based on area and price details regarding vineyards, orchards, hop fields and asparagus fields.

Re c):

The **average economic service life** is estimated for all products that are subject to consumption of fixed capital. This is carried out assuming normal wear and tear and foreseeable obsolescence as a result of technological progress. The estimation also covers the risk of losses due to insurable accidental damage. As it is unrealistic to assume that all products with the same average service life and added in the same year will also retire at the same time, we use a **mortality (retirement) function** to distribute retirements so that they scatter around the average service life in a roughly bell-shaped manner. The **density function of the gamma distribution** is used as the mortality function.⁶¹

Re d):

Straight-line depreciation is applied to assess consumption of fixed capital. The value of fixed capital formation for one year is distributed over the overall period of use in equal annual amounts according to the expected actual service life, in line with the mortality function. The annual **depreciation rate** of a capital good is therefore the reciprocal of its service life in years (except in the investment year and in the year of retirement, when only half of the rate is applied; see the mathematical model in section 4.12.2.1).

Re e):

The consumption of fixed capital is valued on the basis of current replacement prices for the fixed assets in the reporting period, and therefore corresponds to **current prices**. This is in accordance with the valuation of fixed assets at current replacement costs, i.e. at the purchasers' prices of the current reporting period (ESA 2010 Paragraph 3.141).

To sum up:

- if the perpetual inventory method (PIM) is used to calculate the stock of fixed assets,
- if straight-line depreciation is used to assess the consumption of fixed capital for the stock of fixed assets,
- if consumption of fixed capital is calculated at current prices for the reporting period,

the amount of consumption of fixed capital will depend on the following two factors:

- (1) **time series for gross fixed capital formation** that reach far back into the past, and
- (2) estimates of the **service life** of each type of fixed asset.

The only exception is the consumption of fixed capital for tree, crop and plant resources yielding repeat products. This is determined on the basis of the fixed assets, which are in turn based on annual agricultural statistics on total areas sown with each crop, valued at average annual prices taken from the economic accounts for agriculture.

⁶¹ See Schmalwasser, Oda/Schidlowski, Michael: '*Kapitalstockrechnung in Deutschland*', in: *Wirtschaft und Statistik*. 11/2006, pp. 1107 et seq. Slightly abridged version in English available at https://www.destatis.de/EN/Publications/Specialized/Nationalaccounts/MeasuringCapitalStockWista1106.pdf?__blob=publicationFile

4.12.2 Calculation method: using the perpetual inventory method

4.12.2.1 Mathematical model

4.94 If the perpetual inventory method is applied, the following **mathematical model** can be used to determine the consumption of fixed capital directly from these two basic pieces of information, without first having to assess the total value of fixed assets.

4.95 For each investment year i , there is a mortality function $f_i(n)$, which is calculated as follows:

$$f_i(n) = \sum_{\bar{n}} f_{\bar{n}}(n) \cdot \frac{I_{i, \bar{n}}}{I_i}$$

where n is the service life of a fixed asset in years, \bar{n} is the average service life in years, $f_{\bar{n}}(n)$ is the mortality function for assets with an average service life of \bar{n} years, I_i represents the gross fixed capital formation in year i , and $I_{i, \bar{n}}$ represents the gross fixed capital formation for year i with an average service life of \bar{n} years.

4.96 The retirements for the reporting year t (A_t) are obtained as the sum of assets added during the past years i and having a service life of $n = t - i$ years:

$$A_t = \sum_{i < t} I_i \cdot f_i(t - i)$$

4.97 The depreciation function $g_i(t)$ can be calculated on the basis of the mortality function. For each investment year i , the depreciation function indicates the percentage of all gross fixed capital formation to be written off in reporting years $t \geq i$:

$$g_i(t) = \sum_{n \geq t - i} d_t(n) \cdot f_i(n)$$

4.98 The last year of depreciation is the year in which the final asset acquired in the investment year under examination is withdrawn from the stock of fixed assets.

4.99 $d_t(n)$ is the depreciation rate in reporting year t for goods with a service life of n years. When applying the **straight-line depreciation method**:

$$d_t(n) = \frac{1}{2n} \quad \text{for } t = i \text{ and } t = i + n$$

$$d_t(n) = \frac{1}{n} \quad \text{for } i < t < i + n$$

4.100 The rate of depreciation is only half as high in investment year i and in the year of retirement $i + n$ as in the intervening years, because it is assumed that in the first and last years the assets are included in the stock for half a year on average.

4.101 The **consumption of fixed capital** in a reporting year for **assets added in a given investment year** is obtained by multiplying the corresponding share of depreciation with the value of gross fixed capital formation. The following applies to consumption of fixed capital in the reporting year t related to the additions of the i ($D_{i,t}$) year:

$$D_{i,t} = I_i \cdot g_i(t) = I_i \cdot \sum_{n \geq t - i} d_t(n) \cdot f_i(n).$$

4.102 The consumption of fixed capital in reporting year t (D_t) is the aggregate consumption of fixed capital for the various investment years:

$$D_t = \sum_{i \leq t} D_{i,t}$$

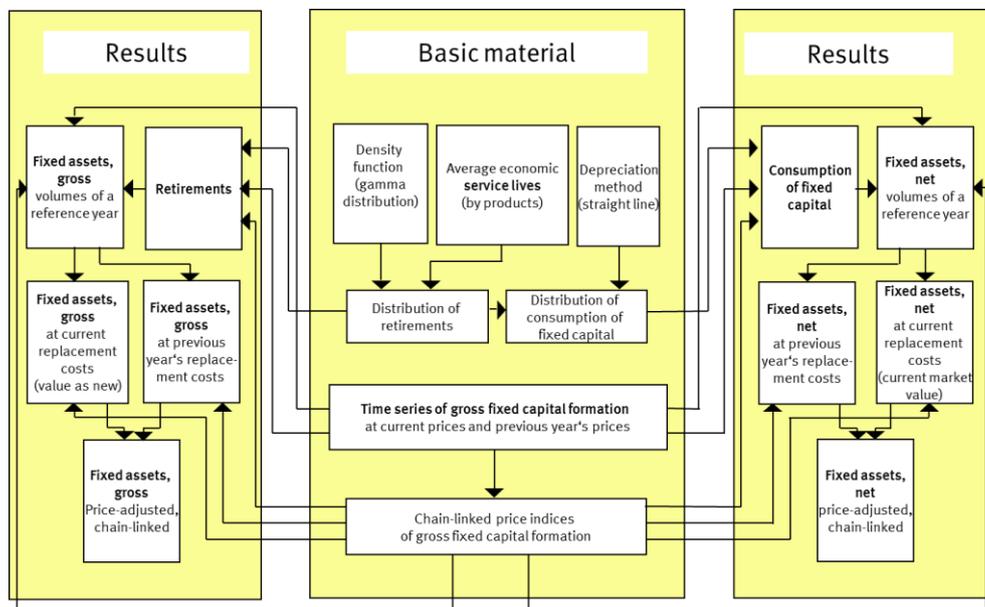
4.103 This model is used to calculate the price-adjusted **consumption of fixed capital at replacement prices for each reporting year**, on the basis of a highly detailed **time series in the form of chained volumes**, and the corresponding distribution of consumption of fixed capital. These are then converted into **current prices** with the aid of highly detailed average annual price indices for capital formation in the reporting year. Depreciations are also determined in the same way in great detail in the prices for the previous year.

4.12.2.2 Schematic representation

4.104 Figure 4–4 schematically outlines the use of the perpetual inventory method (PIM) to calculate fixed assets and consumption of fixed capital. This description clarifies the essential points of the method used:

- Long-term series of data on capital formation at current prices and previous years' prices are required, as well as approaches to service life determination for the various fixed asset types, provided that the straight line depreciation method and gamma function as the distribution of retirements are assumed as given.
- Consumption of fixed capital is calculated in a self-contained way that does not require fixed assets to be calculated in an intermediate step.

Figure 4–4: Calculation of fixed assets and consumption of fixed capital using the perpetual inventory method (PIM)



4.12.2.3 Long time series for gross fixed capital formation

4.105 **Time series for gross fixed capital formation** under ESA 2010 are available for Germany for the years from 1991 onwards according to the revised 2015 status. For the period pre-1991, the old stocks of the former GDR are used for the original series in

relation to the former territory of the Federal Republic of Germany. The internal time series for capital formation for the PIM stretches back to 1799 for buildings, 1899 for equipment and in some cases back to 1945 for intellectual property products.

4.106 Gross fixed capital formation is broken down into:

- more than 200 types of machinery and equipment, eight kinds of buildings and structures and five types of other fixed assets;
- 91 industries⁶²;
- Institutional sectors of the national accounts (five sectors and seven sub-sectors);
- Market and non-market producers,

in other words according to four different classification features. For the purposes of calculating fixed assets and consumption of fixed capital, it is necessary to partly differentiate the already highly detailed capital formation items to an even greater extent according to their service life (see the example of roads in section 4.12.3.3).

4.107 Also, in the case of machinery and equipment, the balance of acquisitions less disposals of existing equipment has to be distributed over industries, as only gross fixed capital formation in new assets is shown for industries in national accounts. Ignoring the balance of existing machinery and equipment in the calculation of fixed assets and consumption of fixed capital would result in excessive levels of consumption of fixed capital and fixed assets being recorded for machinery and equipment. Considerable amounts of sales are recorded, particularly in the case of used ship exports and used motor vehicles sold to households, as well as in the process of scrapping of machinery and equipment. However, genuine data sources are only available for the sales of used machinery and equipment by general government, which are included as such in the general government account. For this reason, the overall balance is distributed over the industries for the recorded categories of assets in line with the industry structure for the purchase of new machinery and equipment. The data of the general government sector are included for the industries concerned.

4.108 Given the atypical use of cars as gross fixed capital formation items for short-term lessors and leasing to households, special assessments are carried out for these two cases. Consideration is given here to the fact that cars only remain in the stock of fixed assets for a very short period of time and are then predominantly sold to households.

4.109 The consumption of fixed capital and fixed assets for buildings by industry are calculated with the new buildings data because the balance for the national economy is zero and there are no data available on acquisitions less disposals between industry sectors.

4.12.2.4 Service life approaches

4.110 **Average economic service life** – the second major input needed for the perpetual inventory method – is to be determined for all gross fixed capital formation time series. Service life is the period during which an asset is actually used for production or is made available, and for which consumption is recorded in national accounts. This value is insecure, because it is forward-looking. In order to determine it in line with ESA 2010, it is necessary to take normal wear and tear into account, as well as economic obsolescence and losses of fixed assets as a result of insurable accidental damage. It is assumed that the assets are correctly maintained and minor repairs are continuously

⁶²Divisions (two-digit headings) and selected groups (three-digit headings) as specified in the classification of areas of economic activity, edition 2008.

made. Service life approaches are determined by breaking down capital formation by type of asset in as much detail as possible.

- 4.111 The estimates of average service life broken down into detailed asset types are revised at relatively long intervals. There are various reasons for this. For example, the fiscal service lives specified in the depreciation tables for fixed assets (depreciation for wear and tear, AfA tables), published by the Federal Ministry of Finance, are always changing. However, not every change in the fiscal service life of fixed assets has to also be reflected in their economic service life. Fiscal service life is only one of many information sources that can indicate that economic service lives may have changed. According to national accounts estimates, economic service life may also change, for example, on the basis of expert assessments or checks on the plausibility of results. The average service lives for almost all assets were revised as part of the 2011 and 2014 revisions.
- 4.112 The main reference points for determining the average service life for the various types of **machinery and equipment and part of the buildings** are set out in the AfA tables published by the Federal Ministry of Finance. These tables contain detailed lists showing the service life that may be assigned to the various types of fixed asset for the calculation of tax depreciation. As the determination of fiscal service life is based on the assumption that individual enterprises act according to the principle of precaution, an asset's whole average economic service life is usually longer than its fiscal service life. That is why the figures in the AfA tables are augmented by an average allowance of 20% to 100%. The information used for that purpose was provided by enterprises and associations (expert assessments).
- 4.113 During the 2011 revision, service lives for **machinery and equipment** were revised and adapted to the 2009 classification of commodities for production (GP 2009). The service life approaches broken down into detailed types of assets are aggregated into 13 service life divisions for machinery and equipment. For example, in the 1991, 2000 and 2010 investment years, the average service lives shown in Figure 4–5 were calculated for the 13 machinery and equipment asset groups, which correspond to the overall economic accounting areas for machinery and equipment. Service life data of equal asset groups is sometimes differentiated by industry. For example, lorries operated in construction industry are supposed to have shorter service lives than those operated in other industries. To determine the service life by industry, a cross-classification of gross fixed capital formation (fixed assets/industries) is applied as described in section 5.10.2.
- 4.114 The service lives for buildings and structures were also checked in the 2011 and 2014 revisions. Adjustments were made to the average service lives for all building types, as the service lives previously used proved to have been too long. The main sources here are the valuation guidelines issued by the Federal Ministry of for the Environment, Nature Conservation, Building und Nuclear Safety, studies by the ifo institute – Leibniz-Institut für Wirtschaftsforschung an der Universität München e.V. and the German Institute for Economic Research in Berlin (DIW), as well as the depreciation tables of local government regions and the Federal Ministry of Finance.
- 4.115 For buildings, particularly dwellings, public buildings and industrial and commercial buildings and structures, the service life distributions were revised in terms of the proportion of new buildings and investment construction measures amongst total building stock. Because most modernisations can be carried out without official planning approval, the proportion of construction measures carried out on existing buildings is under-reported in the construction activity statistics data compiled by the Federal Statistical Office in comparison to new buildings. This is why the modernisation figures in gross fixed capital formation in construction are now derived from the updated construction volume accounts compiled by the German Institute for

Economic Research (DIW) with all due consideration of non-investment repairs, with retroactive effect for all investment years as of 1980. The modernisation measures are taken into account in wealth accounting with almost half the service life of new buildings. A far higher proportion of investment construction measures amongst total building stock in terms of gross fixed capital formation in construction therefore leads to a noticeable reduction in service life. This is reflected in far higher figures for consumption of fixed capital for buildings and structures.

- 4.116 A further adjustment to service lives was made for dwellings and industrial and commercial buildings and structures, with the gross fixed capital formation element relating to costs of ownership transfer on land depreciating more quickly. It is assumed that, in the event of repeated sales, the costs of ownership transfer (land transfer tax, broker, notary and legal fees) that have not yet been fully depreciated will usually not be recovered.
- 4.117 Different sources are also used when determining service life for **intellectual property products**. The original service life approaches were used for traditional intangible assets. The detailed valuations carried out during the 1999 and 2005 revisions for mineral exploration and evaluation, computer software and databases and entertainment, literary or artistic originals are still valid and could therefore be incorporated into the current accounting system. Data from the AfA tables were used for mineral exploration and evaluation. The service life of computer software and databases varies between two groups. A higher service life is applied for mainframe computer software than for PC software. The percentage of PC software increased steadily during the '80s. The percentages of both software categories were also differentiated according to industry. The average service lives of entertainment, literary or artistic originals were estimated on the basis of detailed information on films, TV productions, sound recordings, musical compositions, artistic interpretations and text.⁶³
- 4.118 The main data source for research and development as a fixed asset was a special survey on development and use periods for research and development carried out by the Stifterverband für die deutsche Wissenschaft as part of the 2011 R&D survey.⁶⁴ More than 1 500 enterprises from various industries provided information about the development and use periods of their R&D projects, thus allowing the derivation of R&D service lives by industry. If the figures were insufficiently representative for some industries, corresponding data was also taken from the balance sheets of major enterprises and other national and international data sources.
- 4.119 Different average service lives result **for each year of capital investment** according to the type of asset, industry and sector concerned. Structural effects may occur even if the service life approaches in the most detailed breakdown by asset do not change at all. Each capital investment year therefore has its particular service life distribution. The average service lives by type of asset are shown in Figure 4–5.

⁶³ See also Frankford, L.: 'Urheberrechte in den Volkswirtschaftlichen Gesamtrechnungen' in WiSta 5/2000, pp. 320 et seq.

⁶⁴ See B. Grave, A. Kladroba: 'Entwicklungs- und Nutzungsdauer von Forschung und Entwicklung im Wirtschaftssektor', in Wissenschaftsstatistik GmbH im Stifterverband für die Deutsche Wissenschaft (ed.): 'FuE-Datenreport 2013', Essen 2013, pp. 49 et seq.

Figure 4–5: Average service lives for investment years by asset type

In years

Asset type	1991	2000	2010
Buildings and structures	62	58	51
– Dwellings.....	71	63	52
– Roads	57	54	52
– Other public structures.....	53	50	51
– Public buildings.....	55	50	44
– Other buildings and structures	52	52	51
Machinery and equipment (in line with CPA), including military weapons systems	14	14	14
.....	14	13	14
Machinery and equipment (in line with CPA), excluding military weapons systems			
Other machinery and equipment (CPA 13–24)	13	13	15
Fabricated metal products (CPA 25).....	16	15	16
Computers, electronic and optical products (CPA 26).....	7	7	8
Electrical equipment (CPA 27)	15	16	16
Machinery and equipment (CPA 28)	14	14	14
Motor vehicles, without leasing and short-term leasing (CPA 29_1)	8	8	8
Bodies for motor vehicles; trailers and semi-trailers (CPA 29_2)	11	11	11
Ships and boats (CPA 30_1)	24	25	25
Railway locomotives and rolling stock (CPA 30_2).....	25	25	25
Air and spacecraft and related machinery (CPA 30_3)	20	20	20
Furniture (CPA 31)	18	18	18
Other manufactured goods (CPA 32)	15	14	14
Repair and installation services of machinery and equipment (CPA 33)	16	15	15
Tree, crop and plant resources yielding repeat products			
– Vineyards	20	20	20
– Hop fields.....	15	15	15
– Asparagus fields.....	8	8	8
– Fruit tree plantations	10	10	10
Intellectual property products	11	10	10
– Research and development	12	12	12
– Computer software and databases	5	5	5
– Mineral exploration and evaluation	30	30	30
– Entertainment, literary or artistic originals	5	5	5

4.12.3 Consumption of fixed capital of non-market producers

4.12.3.1 Overview and significance

4.120 Only the **consumption of fixed capital of non-market producers of the general government (S.13) and of the non-profit institutions serving households (S.15)** has a direct influence on the level of gross domestic product and gross national income. The output of non-market producers is determined as the sum of their production costs, in which consumption of fixed capital is included (ESA 2010, Paragraph 3.49). Consumption of fixed capital of non-market producers makes up 12.2% of total consumption of fixed capital. Figure 4–6 provides an overview of market and non-market producers in both sectors by industry.

Figure 4–6: Industries in the general government sector (S.13) and/or non-profit institutions serving households sector (S.15)

WZ 2008	Industry	S.11/S.12/ S.14	S.13	S.15
01	Agriculture, hunting and related activities	MP	MP	
02	Forestry and logging	MP	MP	
36	Water supply	MP	MP	
37–39	Sewerage, waste management; material recovery, remediation activities	MP	MP	
52	Warehousing and support activities for transportation	MP	MP/NMP	
68	Real estate activities.....	MP	MP	
72	Scientific research and development.....	MP	NMP	NMP
84	Public administration and defence; compulsory social security.....		NMP	
85	Education	MP	NMP	NMP
86	Human health activities.....	MP	MP/NMP	NMP
87-88	Care homes and social work activities.....	MP	NMP	NMP
90-92	Art and culture; gambling	MP	NMP	NMP
93	Sports activities and amusement and recreation activities.	MP	NMP	NMP
94	Membership organisations, religious organisations	MP		NMP
96	Other personal service activities.....	MP	MP	

MP = market production; NMP = non-market production

4.121 The consumption of fixed capital of non-market producers in Germany fully adheres to the recommendations of the Eurostat task force 'Consumption of fixed capital on roads, bridges, etc.'. This is already clear for recommendation 1 in Figure 4–6. It shows the clear distinction that is required between market and non-market production according to industries. This detailed calculation is relatively well supported by source data drawn from the financial statistics and other sources. The accounting categories for roads and other structures of the general government exceed the distinctions for roads and further parts of the public infrastructure required by recommendations 2 and 3 in terms of complexity. Significant parts of the infrastructural works contained in the checklist within recommendation 2 are owned by market producers in Germany, e.g.

water supply infrastructure, sewage and refuse disposal systems, railway lines, airports.

- 4.122 For the non-market producers in the sector of non-profit institutions serving households, calculations are carried out for buildings and structures (including a separate assessment for own-account building construction), machinery and equipment, and computersoftware in the industries documented in Figure 4–6. Consumption of fixed capital for the new research and development asset group is determined separately for the three industries concerned. Calculations result in the values shown in Table 4–9:

Table 4–9: Consumption of fixed capital for other non-market producers in the sectors of general government (S.13) and non-profit institutions serving households (S.15) by fixed asset type

Year 2010 in EUR (billions)

Fixed asset types	S.13	S.15
Buildings and structures	31.419	2.356
Machinery and equipment (including military weapons systems)	7.682	1.372
Intellectual property products	11.451	1.922
Total	50.552	5.650
of which: Public administration (NACE 84)	28.123	

4.12.3.2 Long time series for gross fixed capital formation

- 4.123 Recommendation 4 of the task force mentioned in chapter 4.12.3.1 on ensuring the consistency of time series of gross fixed capital formation for the early years is also complied with by the German calculation of fixed assets. Long-term series for gross fixed capital formation in the general government sector were traditionally available in the German national accounts for machinery and equipment, public buildings and public civil engineering works, including roads. Although not written down prior to the introduction of ESA 1995, figures for the gross stocks of public civil engineering works were calculated and published. These long-term series were used and adapted accordingly in the transition to ESA 1995. This included identifying market producers, such as communal waste disposal facilities, and allocating them to the market producers of the general government sector.
- 4.124 For the initial calculation of research and development, the time series for gross fixed capital formation for the years before 1991 in relation to the sectors of general government and non-profit institutions serving households was revised for each industry on the basis of annual calculations for expenditure taken from financial statistics for universities and science, research and development outside universities.
- 4.125 Federal budgets as of 1956 were assessed for revision of the time series for gross fixed capital formation for military weapons systems. Allowances were also recorded for weapons systems taken over from the former GDR, and sales of used military weapons systems to foreign countries were also taken into account.

4.12.3.3 Service life approaches

- 4.126 Various sources were used to determine the service life for **public civil engineering works and military fixed assets**. In the case of roads and waterways, comprehensive calculations were taken from the German Institute for Economic Research (DIW),⁶⁵ which, in addition to analyses of the financial statistics, also provided an important basis for the detailed identification of the time series of gross fixed capital formation in these areas. For hydrological works in the care of local authorities, the Association of Regional Water Authorities (LAWA) has produced guidelines on average service lives.⁶⁶ In addition, the results of a statistical survey conducted by the Ifo Institute for Economic Research on the service lives of infrastructural works⁶⁷, as well as technical data relating to the service lives of outdoor installations from the official guidelines for the estimation of the market value of land⁶⁸, were also used to estimate average service lives. The main basis for the estimation of the average service lives of military equipment that can be used for civilian purposes and military weapons systems are the Public Expenditure Guidelines (Kostenrichtlinie) issued by the Federal Ministry of Defence in various years. The estimates for military buildings were made similarly to those for civilian buildings.
- 4.127 A further breakdown into sub-components is applied, if necessary and possible, when determining the service life approaches for the time series of gross fixed capital formation in the accounting categories. This can be illustrated in the example of roads.
- 4.128 Most of the data on roads are drawn from studies conducted by DIW. As in DIW, a road is not considered to be a homogeneous asset; instead it is considered in terms of the following three investment aggregates, which all have different average service lives:
- | | |
|--|-----------|
| Earthworks | 116 years |
| Road surface | 35 years |
| Civil engineering structures (e.g. tunnels and bridges)..... | 70 years |
- 4.129 DIW has estimated shorter service lives in the case of roads built in the era of the former GDR, due to the poor state of maintenance.

⁶⁵ See particularly Kirner, W.: *Zeitreihen für das Anlagevermögen der Wirtschaftsbereiche in der Bundesrepublik Deutschland*, DIW-Beiträge zur Strukturforchung, Heft 5, Berlin 1968; Bartholmai, B./Enderlein, H./Niklas, J.: *Vorausschätzung des Ersatzinvestitionsbedarfs für die Bundesverkehrswege*, DIW-Beiträge zur Strukturforchung, Heft 83, Berlin 1985; Enderlein, H./Kunert, U./Link, H.: *Berechnung und Bewertung der Verkehrsinfrastruktur in den neuen Bundesländern*, DIW-Beiträge zur Strukturforchung, Heft 149, Berlin 1994. DIW: *Ermittlung des Ersatzinvestitionsbedarfs für die Bundesverkehrswege bis zum Jahre 2020*

⁶⁶ Ländergemeinschaft Wasser, 'Leitlinien zur Durchführung von Kostenvergleichsrechnungen', guidelines compiled by the LAWA working party on cost-benefit studies in water resources management, 1993, Annex 1.

⁶⁷ Richter, M.: 'Herstellungskosten und Folgelasten kommunaler Investitionen', text volume, ifo-Studien zur Finanzpolitik 52, Munich 1992, pp. 109.

⁶⁸ Kleiber, W., (ed.), *Sammlung amtlicher Texte zur Wertermittlung von Grundstücken in den alten und neuen Bundesländern*, Federal Gazette 221a, Cologne 1992, Annex 7, pp. 83 et seq.

- 4.130 The financial statistics for the Federal, state and local governments contain information on road construction work that is subdivided according to the following types of road:
- federal motorways;
 - national roads and regional trunk roads;
 - local major roads;
 - district roads.
- 4.131 Based on the DIW studies, differences in composition from one road type to another and over time were taken into account for capital formation aggregates. This becomes clear when examining the distribution of service lives for the Federal motorways.

Figure 4–7: Distribution of service lives of Federal motorways for selected benchmark years

Components	Service life in years	Shares of components as a percentage of all additions to stock		
		1970	1990	2010
Earthworks.....	116	27	16	12
Road surface.....	35	35	51	65
Civil engineering structures.....	70	38	33	23
Total motorways.....		100	100	100
		Average service life in years		
		70.2	59.5	52.5

- 4.132 The calculation of consumption of fixed capital for roads in Germany according to the DIW studies formed part of the basis for the ideal model described in task force recommendation 5. According to recommendation 6, the assumed service lives should be checked every five to 10 years, taking into account the changes occurring between new construction and reconstruction. This is also being implemented fully by means of regular adjustments to the composition of the components. For example, data from DIW calculations relating to the need for investment in replacements for Federal roads by 2020 have been incorporated.
- 4.133 Separate retirement and consumption of fixed capital percentages are calculated for each service life group based on the gamma function and are then added. According to task force recommendation 7, a mortality function in the form of a bell-shaped curve should be used for the public infrastructure. The density function of the gamma distribution is similar and is used in the entire calculation of fixed assets and consumption of fixed capital for Germany (see section 4.12.1). The German capital stock calculations therefore also correspond in general, including the public infrastructure calculations, to the final recommendation of the task force.

4.12.3.4 Final remarks regarding the accounting method

- 4.134 Based on the time series of gross fixed capital formation and service life approaches for the various components as described above, the consumption of fixed capital for non-market producers is calculated with chain-linked volumes for the reference year 2010 in accordance with the mathematical model explained in section 4.12.2.1 above.

The total consumption of fixed capital for one reporting year is made up of the consumption in various years of investment. This consumption results from the total consumption during the reporting year for the individual investment years from which fixed assets are still held in stock.

- 4.135 For a description of the consumption of fixed capital as real, chain-linked volumes, the calculation process of inflating is repeated once again with the average annual price indices of the previous year, so that figures for consumption of fixed capital differentiated fully by types of assets (for all accounting categories) are also available at the previous year's prices. These are then applied to generate chain-linked indices and chain-linked volumes for the required levels of aggregation using the general chaining method. Given the very stable product structure – which only varies slightly from year to year through additions and retirements (withdrawals) – the deviations of the chain-linked indices from the fixed price index for the consumption of fixed capital are very slight.

Chapter 5 Expenditure approach

5.0 Calculating GDP on the basis of expenditure aggregates

- 5.01 The expenditure approach estimates the economic performance of a national economy from the expenditure side. At the core of this approach is the value of the final use of domestic goods and services. Figures for final consumption expenditure, gross capital formation and the balance of exports and imports (which comprises exports minus imports) have to be determined. These aggregates are also known as categories of use. The composition of gross domestic product by individual categories of use is shown in the following table.

Table 5–1: Expenditure approach aggregates

Year 2010 in EUR (billions)

Final consumption expenditure	1 939.610
of private households.....	1 406.989
of non-profit institutions serving households	39.285
of the general government.....	493.336
Gross capital formation	506.347
Investments in machinery and equipment.....	175.909
Capital formation in buildings and structures.....	237.122
Other capital formation*).....	88.418
Changes in inventories and acquisitions less disposals of valuables	4.898
Balance of exports and imports.....	134.103
Exports	1 090.085
– Imports.....	955.982
Gross Domestic Product.....	2 580.060

*) Cultivated biological resources, intellectual property products

- 5.02 The proportion of final consumption expenditure in the gross domestic product was 75.2% in 2010, with 56.1% expended as household final consumption expenditure and 19.1% as general government final consumption expenditure. Gross capital formation amounted to 19.6% of gross domestic product (gross fixed capital formation 19.4%, changes in inventories and acquisitions less disposals of valuables 0.2%). Balance of exports and imports amounted to 5.2%, with exports making up 42.3% of gross domestic product, while the share of imports was 37.1%.

5.1 Statistical framework

- 5.03 Three main approaches can be used to find the gross domestic product (GDP) via the expenditure side. Firstly, the buyers or users of products can be asked about their

expenditure. Secondly, the producers of goods and services can be asked about their deliveries to consumers, investors and the rest of the world. Thirdly, the consumption structures for goods and services (commodity flow method) can be used. In theory, all three approaches lead to the same result, which means that the decision about which one to use in practice mainly depends on the statistical circumstances and the timeliness required by users.

- 5.04 Many statistical sources are used to calculate the various categories of use. Although the emphasis is on official sources, non-official sources are also used. Some basis statistics come from specific annual surveys, whilst others are based on the aggregated totals of quarterly or monthly figures. The main statistical sources for the individual categories of use as well as the calculation methods are summarised below:

a) Household final consumption expenditure

In the German National Accounts, household final consumption expenditure is calculated on the basis of surveys of household suppliers. In this method, data on the turnovers of suppliers to households are used to determine the level of consumption expenditure. These results are complemented by special assessments by product type, e.g. for tobacco products, motor vehicles and fuels. In the course of major revisions, figures obtained through the commodity-flow method are also used, and data from the household surveys is used to cross-check the results. Section 5.7.2 describes in detail why the results of the supplier method are preferred to the results of household surveys in Germany.

The starting point for calculations in accordance with the supplier method are the turnovers of suppliers to households, categorised by supply sources. Information on the turnover of the various supply sources corresponding to the economic activities of NACE Rev. 2 or WZ 2008 may be taken from various official statistics. These include, in particular, the business register, the annual structural statistics for the various industries and the VAT statistics. Information on private consumption ratios, i.e. the proportion of turnover from sales to households, is available from annual surveys for wholesale and retail trade, which is the largest supply category. The supply of goods and services is broadly diversified between suppliers. While some suppliers specialise in a small number of goods or services, others offer a wide range. To take account of and to determine these heterogeneous structures and the consumption ratios in the best possible manner, the calculations are performed to a detailed level in accordance with the five-digit subclasses of WZ 2008.

Special assessments are carried out for some goods, as good additional sources are available for them or the supply source accounting does not cover them sufficiently. The results of the special assessments are then integrated into the supply source calculations. For example, data from the Federal Motor Transport Authority is used for the calculation of private purchases of cars and fuel; purchases of tobacco products are derived from the tax statistics, and household purchases of electricity are derived from information provided by the Working Group on Energy Balances. Housing services are valued using the stratification method.

b) Expenditure on consumption by non-profit institutions

In accordance with the concept, the final consumption expenditure of non-profit institutions serving households is calculated as a balancing item. Starting from the output of such institutions (total of intermediate consumption, compensation of employees, other taxes on production less other subsidies on production and consumption of fixed capital), the figure for consumption expenditure is found by deducting sales to other sectors and own-account fixed capital formation.

c) Government final consumption expenditure

Government final consumption expenditure is calculated according to the concept by deducting the sales proceeds of non-market production and own-account fixed capital formation, from current expenditure on non-market production in this sector (intermediate consumption, compensation of employees, consumption of fixed capital and other taxes on production less subsidies on production), and by adding social benefits in kind which are purchased by government units on the market.

The statistical sources for calculating consumption expenditure are, for central government, the results for the federal budget prepared by the Federal Ministry of Finance and, for the federal states (Länder) and municipalities, the results of the public finance statistics, in a detailed breakdown by types of revenue and expenditure. In addition, statistics are incorporated which are compiled by the branches of social insurance (the German Pension Fund (*Deutsche Rentenversicherung*), the miners' pension insurance scheme, agricultural pension funds, statutory health insurance schemes, statutory long-term care insurance schemes, statutory accident insurance schemes and unemployment insurance schemes). Furthermore, figures taken from the annual report statistics of public funds, institutions and enterprises and the finance statistics of institutions of higher education are used to calculate the consumption expenditure of extra general government budgets. The statistical sources cover all public budgets in Germany, of which there are ca. 19 000, in their entirety. The consumption of fixed capital is derived from the fixed asset account, in accordance with the perpetual inventory method.

d) Gross fixed capital formation

Various approaches are used to calculate gross fixed capital formation (GFCF); these approaches are described briefly below for the individual components of gross fixed capital formation and are presented in detail in the relevant sections.

- Gross fixed capital formation in machinery and equipment

The commodity-flow method, on a quarterly basis, is the dominant method used when assessing gross fixed capital formation in machinery and equipment; this relies on extensive information on goods that are produced, exported and imported as well as detailed estimates of product-specific fixed capital formation ratios. This (production-side) basis is then transformed into the user-side aggregate value by means of a wide number of supplemental details (e.g. inventory movements, ancillary investment services, and trade and transport margins). Quarterly production statistics (EVAS 42131), monthly foreign trade statistics (EVAS 51141, 51231) and VAT statistics (monthly report; EVAS 42111) are the main sources of data. For motor vehicles, the notifications of new registrations and re-registrations from the Federal Motor Transport Authority are evaluated and correlated with price information from Deutsche Automobil Treuhand, together with the information published by the Ifo Institute on leasing transactions by households.

- Gross fixed capital formation in buildings and structures

The value of gross fixed capital formation in buildings and structures is also mainly determined by applying the commodity-flow approach. The starting point for calculating GFCF in buildings and structures is the information from companies and businesses providing building and associated services. The construction for producers' own use is estimated. The annual survey of companies with 20 or more employees and the annual full survey in the main construction industry are important bases for calculating GFCF in buildings and structures. The value of building completion work is regularly based on the annual VAT statistics. In addition, the (cost) structure surveys for various industries provide information on companies' own-

account capital formation. The VAT statistics and the results from municipal budgets are used to calculate ancillary construction costs. Own-account construction output, which also includes neighbourly assistance and clandestine work, plays an important role within the scope of GFCF in buildings and structures.

- Investor account

As a second pillar of the GFCF calculations the annual fixed capital formation is determined on the basis of information provided by the investor as part of annual investment surveys (investor account). These surveys are available for the producing industries and the majority of service industries, providing a breakdown of investments by the investing industries. This information is combined and harmonised in a cross classification with the results obtained through the commodity-flow method.

- Investments in intellectual property products

Capital formation in research and development is calculated using a multi-stage determination of output and trade flows. Surveys by the Stifterverband für die Deutsche Wissenschaft (Donors' Association for the Promotion of Science and Humanities in Germany) are used to determine private sector expenditure.⁶⁹ For publicly funded research institutions, the 'Survey of expenditure, revenue and staff of public and state-subsidised institutions for science and research'⁷⁰ and the finance statistics of institutions of higher education⁷¹ are used. For foreign trade in research and development, the information on technological services from the Deutsche Bundesbank's Balance of Payments is evaluated.

The statistical basis for the **capital formation in software** is very weak in Germany. The current estimation model for purchased software is based, for the years up to 2000, on a sample from responses to special questions asked within the scope of the Ifo Institute's surveys on the economic climate and, after reporting year 2000, on data from the service statistics. Own-account software is valued using an input model primarily incorporating employment data drawn from the annual microcensuses on computer-centred occupations, with the relevant personnel costs forming the basis for the estimation.

Several sources are used to evaluate the **copyrights** of artistic intellectual property: information from the VAT statistics (EVAS 73311) for relevant industries for radio, film and television production, Ifo Institute's surveys on the production costs for sound media, updated with data from the German Musical Performance and Mechanical Reproduction Rights Society (GEMA), and the Performing Rights Society (GVL), the Copyright Society for Composers and Publishers of Musical Works (VG Musikedition) and the Artists' Social Fund, the distribution of royalties for musical compositions and artistic performances by the collecting societies - the Collecting Society Representing Authors and Publishers (VG WORT), GEMA and GVL, and finally the royalties paid to book authors calculated from the sales reports of the Association of the German Book Trade.

⁶⁹ See Wissenschaftsstatistik GmbH: 'Forschung und Entwicklung in der Wirtschaft' (Research and Development in the Economy). Report on the R&D surveys 2003 and 2004, Essen 2006, pp. 48-52. The current results of the surveys are available at <https://www.stifterverband.org/wissenschaftsstatistik>

⁷⁰ See German Federal Statistical Office: Quality report 'Survey of expenditure, income and personnel of public institutions and institutions receiving public funding for science, research and development 2007', Wiesbaden 2009.

⁷¹ With regard to this section, see Federal Statistical Office: Quality report 'Finance statistics of institutions of higher education', Wiesbaden 2013.

e) Changes in inventories

Changes in inventories are defined as the calculated difference between additions and withdrawals (as well as other losses) of stocks, excluding purely price-related changes in value. The German national accounts follow methods of calculation which rely on stock comparisons. A distinction has to be made, however, between two options: In the areas of economic activity in which stock-keeping features most prominently, the calculation of annual changes in inventories is based primarily on **comparisons of book values**, which can be derived from the cost-structure surveys (EVAS 42251, 43221, 44253, 44254), the annual trade statistics (EVAS 45341), the annual statistics of accommodation and food service activities (EVAS 45342) and the structural survey in the service sector (EVAS 47415). In this connection, it is necessary to adjust the book values in line with the national accounts valuation rules. This may be omitted with the second variant, which is applied more rarely and which uses genuine **volume figures**, the value of which can be fairly reliably assessed with the aid of market prices. This physical data is obtained from the Economic Accounts for Agriculture and Forestry, from the Federal Office for Agriculture and Food and from the reports by the German National Petroleum Stockpiling Agency.

f) Acquisitions less disposals of valuables

For acquisitions less disposals of valuables, the earlier information from Degussa on purchases of gold by households and the figures on external trade in gold from the Deutsche Bundesbanks Balance of Payments are used. In addition, with regard to the acquisition of new works of art, use is made of the turnover figures for museums and art exhibitions according to the foreign trade and VAT statistics (EVAS 73311). The trade-related services relating to existing works of art are calculated using the figures for retail sales of antiques and antique rugs and of second-hand books, drawn from the VAT statistics. For the calculation of jewellery, the quarterly output statistics (EVAS 42131), the small business statistics (EVAS 42252) and, once again, the foreign trade statistics are used.

g) Balance of exports and imports

The balance of exports and imports is calculated from the exports minus imports of goods and services, as classified in the National Accounts. In accordance with the concepts of ESA 2010, exports and imports of goods and services are to be presented in the cross-border change of economic ownership. Since the foreign trade statistics record all physically incoming and outgoing goods, it is necessary for the presentation of the change of economic ownership to add transactions in which the change in ownership has not led to cross-border movements of goods and to deduct cross-border movements of goods which have not led to a change of ownership. The foreign trade statistics (EVAS 51141 and EVAS 51231) are used to determine cross-border goods transactions; the Balance of Payments statistics are used to determine cross-border service transactions.

5.2 Borderline cases

5.2.1 Borderline cases in household final consumption expenditure

Various items are **included** in **household final consumption expenditure** as so-called borderline cases as defined in ESA 2010:

- 5.05 Firstly, the services of **owner-occupied dwellings** are included as a major item in household final consumption expenditure. Both rents actually paid and imputed rents

for owner-occupied dwellings are incorporated in the calculations of final consumption. Housing services for both items are valued using the stratification method in accordance with Regulation (EC) No 1722/2005. Stratified volume figures for rented and owner-occupied dwellings are valued with suitable prices per square meter, in particular on the basis of the 2011 population and housing census. The calculation is described in detail in section 3.18.

- 5.06 A further item is **benefits in kind**, which includes income in kind and own consumption. In many cases, **income in kind** is taken into account in the determination of consumption ratios and cannot be explicitly quantified. For instance, housing services include rented flats which are made available for free or at a discount and which are valued at market prices.

One area in which income in kind is calculated separately is supply source 3 Industry. In this case, a distinction is made between staff sales and payments in kind. Staff sales are where companies sell their products to their own staff, in some cases at a discount. Payments in kind consist of goods being distributed free of charge to employees. Examples include the provision by the employer to employees of free beer or coal, but also free access to sporting or recreational facilities. The income in kind is described in the chapter for supply source 3 Industry. Other separate calculations are performed for rail and air travel (see supply source 9 Transport) and for the private use of company cars (see special assessment for motor vehicles). It is also taken into account that food is often sold to employees at a discount in company canteens (supply source 10 Hotels and restaurants).

- 5.07 **Own consumption** consists of goods and services that are produced by unincorporated enterprises and consumed by members of the household. These refer to:

- agricultural products which are consumed by farmers in their own households,
- services of owner-occupied dwellings
- own consumption in other enterprises
- household services that are provided by paid domestic employees.

Own consumption by households of farmers is calculated by the Federal Office for Agriculture and Food as part of the Economic Accounts for Agriculture and is included in the calculation of household final consumption expenditure (see supply source 1 Agriculture, forestry and fishing). The services of owner-occupied dwellings are calculated in accordance with the model for housing services and are presented in section 3.18. Own consumption in other enterprises is generally included in the surveyed turnover figures of the supply sources that represent the starting point for the calculations of consumption. The amount of remuneration given to paid employees in households is relevant for the calculation of household services. Further details on the calculation process are included in the description for supply source 15.

- 5.08 Household final consumption expenditure also includes **goods that are not recorded as intermediate consumption**, such as materials for minor repairs of dwellings and materials for repairing consumer durables.
- 5.09 In accordance with the national accounts calculations, **materials for minor repairs and renovation of dwellings**, if such work is carried out by tenants as well as by owners, are purchased 70% in Retail trade (supply source 8), 20% in Wholesale trade (supply source 7), 4% in Crafts and trades (supply source 4), 3 % in Industry (supply source 3) and 2% in Construction (supply source 5). The basic calculation process for these supply sources is explained in more detail in the respective sections.
- 5.10 The turnover figures for the NACE/WZ division 95 Repair of computers and personal and household goods are the starting point for the calculations of **repairs and maintenance of consumer durables** (see supply source 15 Other services). If materials

are purchased for repairs, this comes under supply source 8 Retail trade, in this case specifically the WZ subclass 47.52 Retail sale of hardware, paints and glass in specialised stores. The calculations for repairs and repair materials are based on turnovers and are supplemented by allowances for exhaustiveness; consumption expenditure is determined based on consumption ratios. The respective National Accounts approaches are explained under the two supply sources 8 and 15.

- 5.11 **Purchases of material for the repair and maintenance of vehicles** are to be found in the SEA item 0721 Parts and accessories for personal transport. The purchases occur predominantly in the motor trade and, to a lesser extent, in the retail trade. The calculations are explained in more detail in supply source 6 Motor trade and supply source 8 Retail trade.
- 5.12 In the purchase of household goods the full amount is not always paid on conclusion of the sale, rather monthly instalments are often agreed. This type of **hire purchase agreement** is mainly used for high-value household goods. In the national accounts, it is initially a question of allocating the purchases to the relevant time periods. In analyses spanning several years, they only play a role in connection with purchases of motor vehicle. Otherwise, the temporal allocation of purchases is based on the definition of turnover in the source statistics, which represents the starting point for the accounting of consumption.
- 5.13 For purchases of passenger cars, the purchase price is frequently not paid in full on transfer of ownership, rather payment by instalments is agreed. The standard contractual arrangements in the car leasing business in Germany do not meet the criteria of financial leasing as defined in ESA 2010, because there is no complete transfer of risk, and instead may be described, without exception, as operating leasing; this has consequences for the demarcation of car purchases between household final consumption expenditure and fixed capital formation. The values of cars sold are determined, in terms of both household final consumption expenditure and fixed capital formation in machinery and equipment, by means of an analysis of the number of new vehicles recorded in the registration statistics of the Federal Motor Transport Authority . Since these statistics are compiled on the basis of registered keepers, all passenger cars that are privately purchased by means of operating leasing are assigned to 'Employees and persons not gainfully employed'. Under the owner-based approach, which is a primary requirement of ESA 2010, these purchases must be reallocated to the lessors. The reallocations from households to enterprises made as part of the adaptation to the ESA ownership concept are based on the annual leasing survey by the Ifo Institute for Economic Research. Based on this information, the lease instalments of households are then calculated and added to household final consumption expenditure.
- 5.14 It is not only new goods that are bought by households; **second-hand goods** also change hands. Direct purchases of second-hand goods by one household from another should not be recorded. If a trader is involved in the transactions, the transaction costs are to be taken into account and recorded in supply source 8 Retail trade.

Purchases/sales of second-hand goods to and from enterprises should be included in household final consumption expenditure. The sale of used motor vehicles from enterprises to households plays a major role in this area and is calculated using the re-registration records of the Federal Motor Transport Authority . This is explained in detail in section 5.10.2. Insofar as the motor trade is involved in these used car transactions, the transaction costs are included in the accounting of consumption expenditure by means of the calculations in supply source 6 Motor trade.

If other used goods are purchased by households and a trader handles the transaction, these transactions form part of supply source 8 Retail trade, specifically

the WZ subclasses '47.79 Retail sale of second-hand goods in stores' and '47.91 Retail sale via mail order houses or via Internet'. The calculations are explained in supply source 8 Retail trade.

- 5.15 The calculation of financial services provided by financial institutions to households (**FISIM**) and of **service charges in insurance** are explained in supply source 10 Financial intermediation.
- 5.16 It should also be taken into account that for some **insured accidental damage** the insurance company pays the repairing enterprises **directly**, particularly in the case of automotive repairs. The consumption ratios in the motor trade, for example, take account of the fact that some of the turnover represents transactions with insurance companies.
- 5.17 Households also make **payments for licences, permits** etc. They require official documents such as a passport or a driving licence. Fees must be paid for the preparation of these documents. Fees are also collected for the use of other general government services by households, such as tickets for public museums and libraries or parking charges. These payments are recorded as sales to households by general government and their calculation is described in supply source 16 General government.

On the other hand, various items are **not included in household final consumption expenditure** as defined by ESA 2010.

- 5.18 For instance, households receive **social benefits in kind** on a large scale, in particular from statutory social security systems; these benefits are not household final consumption expenditure, but rather consumption expenditure by general government. In this way, households in Germany, insofar as they are covered by the statutory health insurance system (GKV), generally do not make payments to providers of medical care, but instead make monthly contributions to the GKV. The GKV then reimburses doctors, hospitals etc. for any treatment costs that arise. In contrast, the health-related goods and services provided via private health insurance and paid for by households themselves are a component of household final consumption expenditure. Since the calculation of household final consumption expenditure is generally based on the turnover figures of providers of medical care, the payments by the GKV, which can be taken from the financial results of the GKV, are deducted from the turnover.
- 5.19 Households pay a variety of **taxes**. Some taxes are included in household final consumption expenditure, others are not. Since consumption expenditure is to be valued at purchasers' prices, VAT and special excise duties, such as the tobacco tax, are included in the figures. The tax on second homes is also added to the figures for housing services. In general, all other taxes are not part of household final consumption expenditure and are not added. The motor vehicle tax paid by households is recorded as tax and not as consumption expenditure.
- 5.20 Since household final consumption expenditure is calculated using the supplier method, **contributions to non-profit institutions serving households** are generally not included in the source data and are also not added.
- 5.21 Furthermore, **expenditure by owners of dwellings on repairs and maintenance** not typically carried out by tenants is excluded from consumption expenditure by reducing the consumption ratio for these goods accordingly. This may concern either materials for corresponding repairs (supply source 8 Retail trade) or repair activities by building companies (supply source 5).

5.2.2 Borderline cases in gross fixed capital formation

Various items are **included in gross fixed capital formation** as so-called borderline cases as defined in ESA 2010:

- 5.22 Fixed capital formation in **research and development (R&D)** is calculated using a multi-stage determination of output and trade flows. In order to avoid double counting, fixed capital formation in software arising in the course of research and development is subtracted from the accounts, as it is already included in the estimated **fixed capital formation in software**. The R&D purchases of NACE/WZ division 72 'Scientific research and development' are not recorded as fixed capital formation, but as intermediate consumption.
- 5.23 For **military weapons systems**, the budgets of the Federal Government, broken down by category of weapon, are evaluated. For exports of military weapons systems, the Federal Government's annual reports on arms exports are evaluated.⁷² In addition, data on the foreign trade in military weapons systems taken from the foreign trade statistics is incorporated in the figures. For reasons of secrecy, the results are shown aggregated with GFCF in machinery and equipment.
- 5.24 The supply of **non-military weapons** used for fixed capital formation (e.g. hunting weapons, police and security service equipment) is recorded in a differentiated manner in the output, turnover and foreign trade statistics. The same applies to military fixed capital formation that can also be used for non-military purposes (e.g. passenger cars, commercial kitchens). Both groups have long been recorded under GFCF in machinery and equipment.
- 5.25 As part of the GFCF in machinery and equipment, separate fixed capital formation ratios have been applied to the data from the output and foreign trade statistics on **repairs** and (spare) parts for machinery and plant, to reflect their value-increasing effect.
- 5.26 **Financial leasing** as defined by ESA 2010 does not actually occur in Germany (see also section 3.17). As part of the accounting of GFCF in machinery and equipment, the data on capital goods is derived irrespective of the investors and the financing method.
- 5.27 The acquisition of capital goods under an **operating lease agreement** is relevant in Germany in the demarcation of household car purchases from their commercial users: since the data from the Federal Motor Transport Authority, which is generally used for the accounting of passenger cars, is broken down on the basis of registered car keepers and not on the basis of owners, cars leased by households have been allocated to these households, which is not consistent with ESA 2010. For national accounts purposes, these cars have therefore been reallocated to the lessors of movable assets, based on the lease information from the Ifo Institute.

On the other hand, various items are **not taken into account in gross fixed capital formation** as defined by ESA 2010.

- 5.28 Transactions included in intermediate consumption, such as non-capital services and **routine maintenance and repairs**, may be eliminated from the calculations; therefore the product-specific fixed capital formation ratios are reviewed regularly within the

⁷² The Report by the Government of the Federal Republic of Germany on Its Policy on Exports of Conventional Military Equipment in 2014 is currently available from the Federal Ministry for Economic Affairs at <http://www.bmwi.de/DE/Themen/Aussenwirtschaft/ruestungsexportkontrolle,did=716882.html>.

scope of the commodity-flow accounting to determine whether the goods in question have an investment nature and what fixed capital formation ratio seems plausible for them.

- 5.29 **Transactions to be recorded as changes in inventories**, such as the production of cattle or the increase in forestry stocks, are not included in gross fixed capital formation, since this information can be separated out based on the data in the Economic Accounts for Agriculture or Forestry.
- 5.30 The fixed capital formation ratios of **goods that are suitable for both investment and consumption purposes** (e.g. notebooks) are regularly checked for plausibility. The share of private use of company cars are estimated for each industry and added to household final consumption expenditure. Sales of used company cars to households are included on the basis of the re-registration statistics of the Federal Motor Transport Authority .
- 5.31 **Catastrophic losses** are not included per se in the calculation of GFCF using the commodity-flow method; they are determined explicitly in the capital stock estimation.

5.3 Valuation

- 5.32 The assessment of purchasers' prices plays a role for the GDP expenditure side aggregates, whereas output is assessed at basic prices. Non-deductible VAT is generally included on the basis of imputed tax rates.
- 5.33 In principle, **household consumption expenditure is valued** at purchasers' prices. This means that the value added tax and all excise duties, such as tobacco or mineral-oil duty, are included in the value of final consumption expenditure. The source data for the calculations of household final consumption expenditure consists of supplier turnover from various statistics. These turnover figures are already largely in accordance with the purchasers' price concept; for example, they include transport costs and excise duties, but not VAT or tips. VAT is added by using the tax rates from the VAT statistics (EVAS 73311) for the industries which supply households and applying these rates to the turnover figures excluding VAT. Tips are estimated and added to those industries in which such payments are standard. Insurance tax is added for insurance; the second home tax is added for housing services. In the valuation of the quantities of goods in the special assessments, the prices used are inclusive of VAT and excise duties.
- 5.34 In the calculation of **gross fixed capital formation in buildings and structures** in accordance with the commodity-flow approach, the **costs of ownership transfer in land** are explicitly added as a component of ancillary building services. The non-deductible VAT is calculated using a model on the basis of investor accounting and also added separately.
- 5.35 In accordance with ESA 2010, **gross fixed capital formation in machinery and equipment** must be valued at the investor's acquisition cost. The basic costs underlying the output statistics exclude some components that play a part in determining the value of the investment in machinery and equipment: These include capital-formation services (such as assembly and installation), transfer costs (trade and transport margins) and non-deductible net taxes on products. In contrast to the output statistics, the exports of goods are valued fob (free on board) in the foreign trade statistics. In order to make them compatible with the output statistics, they must be reduced by the transport margins up to the border and thus be recalculated to basic costs. On the other hand, the cif (cost + insurance + freight) valuation of the imports of goods in the foreign trade statistics does not yet contain the trade and transport

margins for freight within Germany, which are to be added. Appropriate upward adjustments and deductions are therefore made in the German commodity-flow account in order to produce a valuation of all the components of machinery and equipment at purchasers' prices.

- 5.36 The capital-formation services are estimated and added, in a product-by-product manner, based on the output/turnover relation, since the turnover statistics record turnover at purchasers' costs and thus include these services. Information which the input-output account makes available at irregular intervals is used to calculate the trade and transport margins relating to domestic transfers. The deduction from exports of goods for transport services is currently 4% across the board. The allowance for trade and transport services applied to domestic supply (domestic output – exports + imports), differentiated by goods and already weighted with fixed capital formation ratios, may be found in a subdivision by product categories of the Classification of Commodities (GP 2009). On average, across all items of machinery and equipment, the trade margin is currently 8% of the basic costs and the transport margin 2%.
- 5.37 The customs revenue on imports in extra-Community trade must also be taken into account; the relevant cif values need to be applied to this revenue. In the past, the customs revenue statistics were used for this purpose; these statistics have now been discontinued. Nowadays, data from the Deutsche Bundesbank's monthly reports on EU customs duties is used; this data is listed under tax revenue. Finally, there are the non-deductible (net) taxes on products; these are determined as part of the investor accounting and then converted to capital goods using cross-classification matrices, before being incorporated into the commodity-flow accounting of machinery and equipment.
- 5.38 With regard to **capital formation in intellectual property products**, in contrast to the physical movement of goods, positive trade and transport margins appear to be negligible, so no upward adjustment is performed here.
- 5.39 **Own-account fixed capital formation**, including a mark-up, is assessed for the manufacturing industry in the framework of the GDP production approach from the recorded results of the annual company and cost-structure surveys. The subdivision by own-account building work and own-account fixed capital formation in machinery and equipment is then carried out as part of the calculation of GFCF in buildings and structures.
- 5.40 To record **own-account fixed capital formation in machinery and equipment**, commodity-flow accounting uses the results of the production approach and the investor account classified by industries, which are recoded from an industry-based to a product-based format with the aid of GFCF cross-classification matrices.
- 5.41 **Own-account capital formation in research and development** is, in principle, included by recording all R&D expenditure in sectors S.11 and S.12 in the survey by the Donors' Association for the Promotion of Science and Humanities in Germany. It is adapted to the valuation rules of ESA 2010 through the addition of non-deductible (net) taxes on products, of consumption of fixed capital for R&D output and of a profit margin. Finally, the subdivision into own-account R&D and purchased R&D is carried out by modelling the R&D trade flows in the context of compilation of GFCF in research and development.
- 5.42 The determination of **own-account software** forms a separate computational branch in the model calculation of software capital formation. It is based on the internal expenditure for software production, which is in turn based on the employment data for computer-centred occupations drawn from the microcensus.

- 5.43 The desired form of valuation for **intellectual property rights** is approximated by a reference to statistical source data on turnover or royalties. In the case of **purchased software**, the valuation is achieved by extrapolating the relevant survey data from the Ifo Institute for Economic Research. In general, however, it must be stressed that, on account of the paucity of the underlying data, these calculations are subject to a significant degree of estimation and measurement uncertainty and the above valuation rules will only be able to determine value when a considerably better data-driven calculation method becomes available.
- 5.44 There is at present no sufficiently exact statistical basis for the valuation of **costs of ownership transfer** on the sale of capital goods. This applies, for example, to the foreign trade in used vehicles and the export of used ships. In some cases, individual reports are evaluated to ensure that the recorded figures are as accurate as possible. Sales of company cars to households in Germany may be recorded on the basis of the re-registration statistics of the Federal Motor Transport Authority. However, the applicable prices for these sales – and also the sales of lease cars that were previously kept by households – can only be approximated using model-based estimates. Trade transactions in capital goods between the previous and the new German investor cannot be recorded. Only the acquisitions and the – quantitatively more significant – disposals of used goods, which are recorded via the foreign trade statistics, are assigned a ratio and used as net deduction items in the commodity-flow account. In view of the statistical uncertainty that prevails for used machinery and equipment, the adjustment for trade margins is generally omitted.
- 5.45 In the determination of **changes in inventories**, the central conversion method in national accounts focuses on the elimination of 'paper profits and losses' (ESA terminology: 'holding gains and losses'). It must be ensured that the changes in inventories reported in the national accounts are based on actual physical stock movements and not solely on changes in the price of the stored goods. From the perspective of ESA, the idealised correction summand would be the product of the average physical stock quantity of a commodity during the reporting period multiplied by the difference in the price of the commodity between the beginning and end of this period. In the German national accounts, the product of the annual rate of change of the relevant price index and the average book value over the same period is used as a good approximation for this.
- 5.46 In accordance with ESA 2010, transactions are to be recorded on an **accrual basis**. For changes in inventories and GFCF in intellectual property products and machinery and equipment, allocation to the correct accrual period is based on the use of source statistics that are generally published more than once a year, or which are at least available for a defined period corresponding to the limits of the reporting period. The starting point for the calculation of GFCF in buildings and structures is the annual output of the main construction industry, which is defined in exactly the same way as the value for output in the national accounts. The upward adjustments in manufacturing are derived from the output statistics and therefore also relate to output rather than turnover. With services, on the other hand, we may assume that turnover is, by definition, equivalent to output.
- 5.47 **Exports and imports of goods** are valued fob (free on board) at the border of the exporting country. Since the foreign trade statistics also value exports of goods fob, these values may be used. Imports of goods are valued cif (cost, insurance and freight) in the foreign trade statistics and so must be adjusted for transport costs. **Exports and imports of services** are valued at market prices, which is consistent with the valuation of imports of services at purchasers' prices and the valuation of exports of services at basic prices.

5.4 Transition from private accounting and administrative concepts to ESA 2010 national accounts concepts

5.48 The definitions and measurement concepts of all the statistical sources for the calculation of national accounts must be tested for consistency with ESA and, if necessary, adjusted. In the case of official primary surveys for national accounting purposes, the ESA 2010 definitions may already be incorporated in the design of specialised statistics, in order to keep expenditure on additional calculations as low as possible. However, the opportunities to influence the definition and concepts of secondary statistics, i.e. data collections that do not primarily serve the needs of national accounts, are usually few. Concept-related allowances and adjustments to the source data are therefore frequently required. A number of these conceptual adjustments relating to the expenditure approach aggregates of GDP are described below:

a) Household final consumption expenditure

One important conceptual difference between private accounting and the concepts of ESA 2010 is the inclusion of imputed rents for owner-occupied dwellings (see section 3.18). A further conceptual difference in the case of insurance is the recording of the so-called 'service charge', instead of the insurance premium (see Supply source 12 Financial and insurance activities). There are other conceptual differences in relation to tips, payments in kind and own consumption and drawings by entrepreneurs for private purposes. Tips are not initially included in the turnover of supply sources in which such payments are standard. This concerns tips in hotels and restaurants (see supply source 10 Hotels and restaurants), for taxis and moving companies (see supply source 9 Transport), for motor vehicle repairs (supply source 6 Motor trade), hairdressers (see supply source 15 Other services), which are added on the basis of estimates. With regard to payments in kind and own consumption, please see section 5.2.1 and the further references cited here. In addition, the provision of financial services by financial institutions (indirectly measured; FISIM) does not correspond to private accounting rules, but is a specific feature of ESA 2010. The allocation of FISIM to the sectors is described in section 17.3, with the part attributable to households being integrated in supply source 12 financial and insurance activities. Not all expenditure of households on repairs – in particular of dwellings – is household final consumption expenditure as defined by ESA, but may rather be intermediate consumption in the area of housing services. See section 5.2.1 for a more detailed explanation.

b) Consumption expenditure of governments and PNISH

The most important conceptual differences from the accounting data in these sectors are the inclusion of imputed social contributions for the insurance scheme for civil servants and the estimation of capital consumption.

c) Gross fixed capital formation

In terms of capital formation, the main differences between the private, tax and commercial law accounting and administrative concepts and the national accounts rules are based on the different definitions and valuation principles. For instance, R&D services which are treated as capital formation in the national accounts are not capitalised in reality (or only in the form of their securitised results). In cases in which capitalisation is optional, such as software, they are not fully capitalised. Furthermore, wherever immediate write-offs are permitted by German tax law, economic goods are immediately expensed, thus decreasing earnings, even though they are used

permanently in the production process. Since calculations of capital formation in the German national accounts can additionally be based on financial statements drawn up in line with tax and commercial law in a supplementary capacity, in most cases these conceptual differences have no impact on the national accounts results. However, the official specialised statistics often cannot be used directly.

Firstly, with regard to **GFCF in machinery and equipment**, in the determination of which there are differing definitions of price, owner and goods: in the context of commodity-flow accounting, one of the first steps is to identify the heterogeneous **price concepts**, e.g. in the output and foreign trade statistics. This involves converting basic prices to purchasers' prices, among other things by adding so-called trade and transport margins. The transport margins include all the services that may be assumed to be required in connection with the transfer of goods in addition to the basic transport service, e.g. transport insurance activities. These margins are estimated in accordance with the results of the input-output account.

Different methods of **allocating vehicles to owners** constitute a problem for the recording of passenger car leasing in a manner compatible with national accounts principles: the data from the Federal Motor Transport Authority is broken down on the basis of registered keepers, so that leased vehicles are allocated to the person responsible for the vehicle, even though these vehicles are owned by other statistical units – in this case the leasing companies. In the accounting of passenger cars under machinery and equipment, these vehicles have therefore been reallocated to the lessors of movable assets, based on the lease information from the Ifo Institute for Economic Research.

Differences in the **definitions of goods** relate, for example, to the specified minimum value of machinery and equipment: the abolition of the previous value limit of 500 ECU (at 1995 prices) made it necessary, in the commodity-flow accounting of GFCF in machinery and equipment, to review and adjust the figures in the specialised statistics and the model-based fixed capital formation ratios of plausible product groups (e.g. motorised garden tools, electric hand tools, desktop printers etc.). The review found that the level of detail in the statistical material was insufficient for a clear and distinct identification of the relevant goods, and that the categories in which it may be assumed that the relevant goods are located either already had high ratios or displayed a relatively low volume. As a result, and in view of the considerable estimation leeway built into the existing model calculation, no substantial upward revision of machinery and equipment were made. In accordance with ESA 2010, the components of machinery and equipment are sometimes also to be recorded under services. In commodity-flow accounting, the statistical output and foreign trade data on repairs and on spare parts and add-on parts for machinery and plant is weighted with product-specific fixed capital formation ratios in order to include their value-increasing effect in accordance with national accounts rules.

There is an analogous procedure for **GFCF in buildings and structures**: this is because the delimitation between capital-formation and non-capital-formation construction services in existing buildings is somewhat fluid. Modelling is the only option in this case, with repair ratios for non-capital-formation repairs being defined in a differentiated manner by product groups within the producer groups (see 5.10.1).

The lack of a broad data basis means that conceptual differences in the determination of capital formation in software are not immediately apparent; they do, however, exist: a clear conceptual distinction exists in Germany and in many other countries between business accounting and the ESA 2010 regulations particularly when it comes to including the value of own-account software. The input-oriented modelling of own-account software based on the microcensus avoids this problem.

Conceptual differences from the specialised statistics were mitigated in the price calculation for software: the transition to ESA 2010 was used as an opportunity to replace the price indices for deflation which had previously been estimated by an input method. The index series that is now used is based on price statistics for various software development services and extends back to reporting year 2006. For years prior to 2006, the old price indices have been revised and adapted to the subsequent years.

In contrast, the data bases for determining capital formation in **research and development** are comparatively robust, although the surveys for the non-government sectors lack several value-determining elements: various transitional items have therefore been recorded in the output account for research and development, which is upstream of the R&D investment account, in order to bring the baseline material into line with ESA. In essence, net mark-ups, indirect taxes on products, subsidies and consumption of fixed capital are incorporated in R&D output and imputed double counting of software capital formation is adjusted, based on the expenditure reports by enterprises in connection with the Donors' Association survey.

d) Changes in inventories

In the cost-structure surveys, inventories and inputs of raw materials, supplies and goods for resale are to be valued at purchasers' prices, while inventories of work in progress and finished products from own production are to be valued at basic prices. In line with the strict lowest value principle, the minimum of the purchasers' prices, replacement costs and a low value including price fluctuations could be used here. ESA 2010, on the other hand, requires a valuation at current market prices or costs. As the German national accounts do not currently include inventories, the conceptual change during the reporting period is limited to value-determining price effects (so-called paper profits). ESA 2010 also records crops before harvesting (or logging) as a change in inventories (natural growth, growing crops or standing timber). In business accounting on the other hand, production is not recorded until after the harvest, so this is a difference of concept due to the system.

e) Balance of exports and imports

Following the introduction of ESA 2010 and the sixth edition of the Balance of Payments and International Investment Position Manual (BPM6), there are no longer any conceptual differences between the national accounts and the balance of payments.

5.5 The roles of direct and indirect estimation methods, benchmarks and extrapolations

- 5.49 Direct and indirect methods of estimation are used on the expenditure side of GDP. **Direct estimation methods** are considered here to be those where the required figures (final consumption expenditure, fixed capital formation, exports and imports) are recorded directly as statistical data. Conversely, these figures are not collected directly in the case of **indirect estimation** methods, but are derived indirectly from other values (generally on the basis of a model). However, the use of direct or indirect methods cannot per se be interpreted as an indication of quality. In some cases, an indirect estimate may even be more reliable than data collected in a survey.
- 5.50 Indirect methods are predominantly used for the calculation of household final consumption expenditure, since for the most part the results are determined in

accordance with the supplier approach. The direct calculation method would be to determine consumption expenditure by means of surveys of households.

- 5.51 Direct methods of estimation are primarily used in the expenditure approach when calculating government final consumption expenditure (chiefly based on data from the public finance statistics) as well as in the calculation of imports and exports on the basis of information from the foreign trade and balance-of-payments statistics.
- 5.52 When calculating gross fixed capital formation, indirect estimation methods are predominantly used, although they are reconciled against direct information from the investment surveys. Commodity-flow accounting is an indirect method of determining GFCF in machinery and equipment, as it is based on production and trade documents, and not on the capital formation activities themselves (or the recording thereof). The value of intellectual property rights in artistic originals is estimated using a simplified, turnover-based (i.e. indirect) method, which was derived, in the course of the major national accounts revision in 2005, from a procedure that was based more closely on the production processes giving rise to the intellectual property rights. The new method was the subject of a successful verification by Eurostat as part of a review of reservations. Acquisitions less disposals of valuables are also estimated indirectly via sales revenues. The model calculation of fixed capital formation in software and databases may be seen at best as a continuation of the direct approaches, for the extrapolation of the Ifo Institute's survey data on software. Since, with the exception of the intermediate consumption in NACE/WZ division 72, all own-account production and purchases of research and development are defined as R&D capital formation, the derivation of this value from surveys on R&D expenditure and purchases may be regarded as a direct method, even if adjustments or additions are required. This applies even more to for the calculation of changes in inventories from the book value of stocks.
- 5.53 In principle, both **benchmarks** and extrapolations can be used in parallel in the aggregates of the expenditure approach. Parts of the aggregates are calculated using benchmarks which are available each reporting year, whilst other parts are determined by means of extrapolation.
- 5.54 It is possible to use benchmarks in connection with direct or indirect methods of estimation, provided the source data are available each year. Both direct and indirect methods may also involve extrapolation algorithms if a benchmark year determined by the actual method is being extrapolated. The issue of whether to use benchmarks or extrapolations is therefore in principle independent of the application of direct or indirect methods of estimation.

Table 5–2: Expenditure approach aggregates of gross domestic product

Application of benchmarks or extrapolation

	Benchmarks	Extrapolation (benchmark year)
Final consumption expenditure		
of private households.....	X	2011 population and housing census
of non-profit institutions serving households	X	
of the general government.....	X	
Gross fixed capital formation		
GFCF in machinery and equipment.....	X	quarterly calculation
GFCF in buildings and structures.....	X	
Intangible assets and equipment	X	from t-1
Changes in inventories and acquisitions less disposals of valuables.....	(X)	from t-1
Balance of exports and imports		
Exports	X	
Imports.....	X	

- 5.55 Contemporary annual figures chiefly provide the basis for calculation of household as well as government final consumption expenditure, gross fixed capital formation and imports and exports. As well as this, extrapolations may be significant, insofar as large-scale censuses carried out at intervals of several years still play a role.
- 5.56 The figures for household final consumption expenditure are based on a variety of annual surveys and annual information from the business register. Extrapolations with respect to 2010 are carried out mainly in the calculation of housing services, since in this case the 2011 population and housing census (GWZ) is used for the extrapolation forwards and backwards of the quantitative housing stock.
- 5.57 The calculations of GFCF in machinery and equipment are carried out quarterly; simplified output, turnover and foreign trade indices are initially used and are then replaced, no more than six months later, by highly differentiated specialised statistics. All capital formation in intellectual property products and changes in inventories are based on sources that are available no earlier than 15 months after the end of the reporting period. This means that estimated figures are required in the annual accounts in the summer of year t for the whole reporting year t-1 and for the first two quarters of reporting year t; these figures are generally derived from extrapolations of the last statistically verified reporting year or, in the case of highly volatile indicators, from average values for the last three to five reporting years. The extrapolation assumptions and procedures, as well as their results, are also reviewed annually to ensure that a representative picture is produced of the indicator in question. For intellectual property products and changes in inventories: available information is used directly in the calculation, while any missing calculation components are extrapolated. The rate of change in the characteristic value between reporting year t-2 and year t-1 is generally used as an estimate of the rate of change between t-1 and t. In general, the benchmark year is thus t-1. Substitute indicators are not used. The results as well as the underlying assumptions are reviewed on an annual basis.

5.6 The most important methods of ensuring exhaustiveness

5.58 Ensuring the exhaustiveness of gross national income and gross domestic product is one of the main concerns of European-level national accounts harmonisation and of the German national accounts. Several measures are used for this purpose, which will be outlined below. A more detailed description and quantification of the allowances is provided in the respective sections on the individual calculations and in Chapter 7.

a) Household final consumption expenditure

The statistics used for the calculation of household final consumption expenditure cannot, for various reasons, adequately cover the value to be depicted in the national accounts. In part, this is on account of technical statistical reasons, such as cut-off limits for statistics, e.g. the VAT statistics and the business register, which with respect to turnover is mainly based on the VAT statistics. The VAT payable on turnover is not collected from enterprises if their turnover plus the applicable tax did not exceed EUR 17 500 in the previous calendar year and is not expected to exceed EUR 50 000 in the current calendar year (Value Added Tax Act). Enterprises with an annual turnover of less than EUR 17 500 – insofar as they do not have any employees liable for payment of social security contributions – are therefore not included in the business register, the annual surveys or the VAT statistics (advance VAT returns). If the business register is used for national accounts purposes, allowances should be applied for small businesses. The statistics on VAT assessments can be used for this, since they also include small businesses. Their turnover may be used to calculate an allowance, e.g. in wholesale and retail trade and hotels and restaurants. In hotels and restaurants, an additional calculations are applied for small-scale private accommodation, since it is assumed that there is a particularly high level of under-reporting by small businesses in this area.

To ensure the exhaustiveness of the national accounts, in addition to the benefits in kind described above in section 5.2.1, tips must also be taken into account. The payment of such tips is standard in only a small number of industries, but is of great importance in hotels and restaurants. Since they are not included in the statistics, these figures are based on estimates.

In addition, allowances are applied for the hidden economy. This includes, for example, activities without invoices, own-account house construction and unpaid work, which are also not recorded in the statistics. The term 'hidden economy' is defined in section 7.1.2, which also includes a description of the calculation model based on the 'Financial Monitoring Unit to combat illicit employment' which is a work area of the German customs administration. A large number of further allowances are applied within the various supply sources, which are described in the relevant sections.

To determine household final consumption expenditure, the results of the supply source account classified by purpose were compared with the results of the Income and Consumption Sample Survey 2008. Significant deviations were investigated in a targeted manner and, if necessary, adjustments were made in the national accounts approaches. Findings from the input-output accounts for previous years could also be incorporated in the national accounts calculations for the 2014 revision. In addition, non-official data sources are also used to check exhaustiveness.

b) Gross capital formation

- Own-account fixed capital formation: The allocation of own-account fixed capital formation for GFCFin buildings and structure and in machinery and equipment in the manufacturing industry is based on summary data from the production approach. These are broken down into buildings and machinery and equipment in the investor account. Own-account software has its own model calculation, based on employee data from the microcensus. Own-account capital formation in research and development is the remainder of total research and development expenditure after the deduction of domestic sales and exports.
- Non-reporting entities: Output statistics are only reported by enterprises with 20 or more employees. For the calculation of machinery and equipment, the domestic supply of goods derived from the aggregated specialised statistics is multiplied by extrapolation factors based on the corresponding supplementary estimates used in the accounting of domestic product with the production approach. The data sources for reporting year 2010 are the structural surveys of enterprises with 1-19 employees. Since, however, it may be assumed that specialised capital goods manufacturers are under-represented in the small business sector, the general extrapolation factors from the production approach are reduced.
- Changes in inventories: The change in inventories of finished goods and work in progress held by capital goods manufacturers is derived directly from the difference between the original output/turnover ratio and the ratio after it has been adjusted using moving averages, by applying this ratio differential to the original turnover figure and downscaling it to investment level using the average fixed capital formation ratio. This approach has no significant effect on the annual total of the changes in inventories, so that these might better be described as temporary allowances for exhaustiveness.
- Second-hand goods: Used machinery and equipment are recorded explicitly at the end of the commodity-flow account: the only items, however, which have the effect of increasing value are the imports of used machinery and equipment, which, like the exports thereof, are drawn from the foreign trade statistics. In contrast, sales of used machinery and equipment to domestic non-investors (especially own-use and leased motor vehicles) and the scrapping of assets have the effect of reducing value. Likewise, the inclusion of the private use of company cars as consumption also has the effect of reducing value.
- Trade and transport margins: The value of **machinery and equipment** is to be increased by trade and transport margins incurred en route to the investor. These are based on extrapolated results from the input-output account which incorporated, among other things, information from the wholesale, retail and hospitality trade census and the wholesale and retail trade statistics. The allowance rates used are reviewed on the basis of the input-output account.
- Non-deductible taxes on products: Non-deductible taxes on products are determined for **machinery and equipment** using the investor account. The amounts of tax derived in this way, broken down into investing industries, are recoded to the product classifications of the commodity-flow account with the help of GFCF cross-classification matrices.

- Comparison with the investor account: The results of the product-related calculation of **GFCF in buildings and structures** and, in particular, of **GFCF in machinery and equipment** are compared with the direct investor data from the investment surveys. The introduction of the annual service statistics (for the first time in the year 2000) has brought about an obvious improvement to the data. In the investor account, however, there are still gaps in the data concerning some industries, which can only be closed by means of supplementary estimates. In addition, it is only available on an annual basis and does not therefore provide any seasonal information.
 - Comparison of production and sales: In the commodity-flow accounting of **GFCF in machinery and equipment**, capital-formation services and ancillary services that are not included in (physical) output as measured by the output statistics are added as estimates according to the ratio between the output and turnover statistics.
 - Revisions and specific special accounts: The calculations of capital formation in **intellectual property products**, which are mostly based on models, do not include any explicit additions for exhaustiveness apart from the elements mentioned. Attention was, however, implicitly paid to ensuring that the estimated figures were sufficiently high, e.g. when determining the ratios to be applied to the VAT data in the calculation of intellectual property rights which are recorded in excess of the volumes previously calculated in detail.
- 5.59 Besides the wide-ranging checks for exhaustiveness, which have already been described, separate examinations were conducted in many areas of the national accounts to ensure that no relevant data have been omitted; to this end, recorded figures are reconciled with special data sources, some of which are unofficial, relating to activities such as own-account building work, prostitution, private tuition, tips and income in kind. The information gained from comparison with the household budget surveys was considered on the expenditure and production sides of GDP, particularly in the supply sources and the hotels and restaurants industry, and personal services.

5.7 Household final consumption expenditure

5.7.1 Overview of calculations

- 5.60 The final consumption expenditure of households comprises the expenditure of all resident households on goods and services for the direct satisfaction of their individual needs. In the German national accounts, household final consumption expenditure is calculated using the **supplier approach**. This method is based on the turnover of the suppliers of goods and services and determines the consumption ratio of households. For this purpose, all the available statistics on the suppliers are evaluated. The suppliers are broken down into '**supply sources**' which generally correspond to the economic activities in NACE Rev. 2 or the German classification of economic activities WZ 2008. Household final consumption expenditure by supply source is the basis for determining the consumption expenditure of households in Germany. In order to arrive at the household final consumption expenditure according to the national concept, we must add consumption expenditure in the rest of the world by residents of Germany and subtract consumption expenditure in Germany by residents of other countries.
- 5.61 The calculation by supply source according to the domestic concept is followed by accounting according to purpose. The **purposes** correspond to the German Classification of Household Income and Expenditure (SEA 1998) and thus also to

COICOP (Classification of Individual Consumption by Purpose). The highly detailed supply source accounting broken down into five-digit WZ subclasses makes an accurate attribution by purpose possible, while annual sample surveys in the wholesale and retail trade and in hotels and restaurants provide data for the allocation to the SEA items. The special assessments for certain products also enable them to be allocated to the SEA items.

- 5.62 The table below shows consumption expenditure in Germany (domestic concept) broken down both by supply source and by purpose. The transition from the domestic concept to the national concept is also represented.

On account of the supply source approach, the present method description is also based on supply sources and special assessments. The calculation by supply source, including special assessments, generally determines the level of consumption expenditure. This is then followed by the classification according to purpose. The data on the individual purposes is typically derived from only a small number of supply sources, as the following table shows.

Table 5–3: Household final consumption expenditure by supply source and purpose
Year 2010 in EUR (billions)

Supply source	Household final consumption expenditure in Germany	Purpose (SEA=COICOP)				
		Food and non-alcoholic beverages	Alcoholic beverages, tobacco and narcotics	Clothing and footwear	Housing, water, electricity, gas and other fuels	Furnishings, household equipment and routine household maintenance
		SEA 01	SEA 02	SEA 03	SEA 04	SEA 05
1 Agriculture, fishing	7.1	3.5	1	0	0.5	0.2
2 Energy supply	53.7	0	0	0	53.7	0
3 Industry	6.4	0.4	0.3	0.8	0.2	1.8
4 Crafts and trades	28	19.6	0	0.1	0.2	2.2
5 Construction	4.8	0	0	0	3.8	0.9
6 Trade in/ repair of motor vehicles	83.7	0	0.1	0	0	0
7 Wholesale trade	25.5	2	10.9	0.8	5	1.9
8 Retail trade.....	471.5	115	31.5	63.5	12.8	72.2
9 Transportation and storage	47.4	0	0	0	0	0
10 Hotels and restaurants	63	0.3	0.1	0.1	0	0
11 Information, communication..	53.3	0	0	0	0	0
12 Financial and insurance activities.....	87.5	0	0	0	0	0
13 Housing services	265.4	0	0	0	265.4	0
14 Health services	59.1	0	0	0	0	0.3
15 Other services	97.3	0	1.2	1.4	0.1	10.4
16 General government	12.1	0	0	0	0	0
17 Non-profit institutions	6.9	0	0	0	0	0
Household final consumption expenditure in Germany	1372.9	140.7	45.1	66.7	341.7	89.9
Consumption expenditure by residents of Germany in the rest of the world	59.5					
Consumption expenditure by residents of other countries in Germany.....	25.4					
Household final consumption expenditure (residents of Germany).....	1407					

(Table 5–3 continued)

Supply source	Purpose (SEA=COICOP)						
	Health	Transport	Communication	Recreation and culture	Education	Restaurants and hotels	Miscellaneous goods and services
	SEA 06	SEA 07	SEA 08	SEA 09	SEA 10	SEA 11	SEA 12
1 Agriculture, fishing.....	0	0	0	1.6	0	0.4	0
2 Energy supply	0	0	0	0	0	0	0
3 Industry	0.1	1.4	0	1.1	0	0	0.4
4 Crafts and trades	0.6	0.4	0	0.4	0	3.7	0.8
5 Construction	0	0	0	0.1	0	0	0
6 Trade in/ repair of motor vehicles	0	82.1	0	1.3	0	0.1	0
7 Wholesale trade.....	0.7	1.9	0.1	1.6	0	0	0.6
8 Retail trade	25.7	50.9	4	67.4	0	0.3	28.3
9 Transportation and storage	0	44.5	2.7	0.2	0	0	0
10 Hotels and restaurants.....	0	0.1	0.1	0.9	0	61.3	0.2
11 Information, communication.....	0	0	32.1	20.4	0	0.5	0.3
12 Financial and insurance act.	0	0	0	0	0	0	87.5
13 Housing services.....	0	0	0	0	0	0	0
14 Health services	41.9	0	0	0	0	0.5	16.4
15 Other services.....	0	6.9	0	34.8	4.7	1.2	36.6
16 General government.....	0.3	0.6	0	1.8	3.3	0.3	5.9
17 Non-profit institutions.....	0.2	0	0	1.9	2.3	0.1	2.5
Household final consumption expenditure in Germany.....	69.4	188.7	39.1	133.4	10.3	68.4	179.5
Consumption expenditure by residents of Germany in the rest of the world.....							
Consumption expenditure by residents of other countries in Germany							
Household final consumption expenditure (residents of Germany).....							

Table 5–4: Household final consumption expenditure in Germany
Year 2010, overall proportions for each purpose in %

Supply source	Purpose (SEA=COICOP)						
	Food and non-alcoholic beverages	Alcoholic beverages, tobacco and narcotics	Clothing and footwear	Housing, water, electricity, gas and other fuels	Furnishings, household equipment and routine household maintenance	Health	Transport
	SEA 01	SEA 02	SEA 03	SEA 04	SEA 05	SEA 06	SEA 07
1 Agriculture, fishing	2	2	0	0	0	0	0
2 Energy supply.....	0	0	0	16	0	0	0
3 Industry.....	0	1	1	0	2	0	1
4 Crafts and trades.....	14	0	0	0	2	1	0
5 Construction.....	0	0	0	1	1	0	0
6 Trade in/ repair of motor vehicles	0	0	0	0	0	0	44
7 Wholesale trade	1	24	1	1	2	1	1
8 Retail trade.....	82	70	95	4	80	37	27
9 Transportation and storage.....	0	0	0	0	0	0	24
10 Hotels and restaurants	0	0	0	0	0	0	0
11 Information, communication	0	0	0	0	0	0	0
12 Financial and insurance act.	0	0	0	0	0	0	0
13 Housing services	0	0	0	78	0	0	0
14 Health services.....	0	0	0	0	0	60	0
15 Other services	0	3	2	0	12	0	4
16 General government	0	0	0	0	0	0	0
17 Non-profit institutions .	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100

(Table 5–4 continued)

Supply source	Purpose (SEA=COICOP)				
	Communication	Recreation and culture	Education	Restaurants and hotels	Miscellaneous goods and services
	SEA 08	SEA 09	SEA 10	SEA 11	SEA 12
1 Agriculture, fishing	0	1	0	1	0
2 Energy supply.....	0	0	0	0	0
3 Industry.....	0	1	0	0	0
4 Crafts and trades.....	0	0	0	5	0
5 Construction.....	0	0	0	0	0
6 Trade in/ repair of motor vehicles	0	1	0	0	0
7 Wholesale trade	0	1	0	0	0
8 Retail trade.....	10	51	0	0	16
9 Transportation and storage	7	0	0	0	0
10 Hotels and restaurants	0	1	0	90	0
11 Information, communication.....	82	15	0	1	0
12 Financial and insurance act.	0	0	0	0	49
13 Housing services	0	0	0	0	0
14 Health services.....	0	0	0	1	9
15 Other services	0	26	46	2	20
16 General government....	0	1	32	0	3
17 Non-profit institutions	0	1	22	0	1
Total	100	100	100	100	100

SEA 01 Food and non-alcoholic beverages

82% of purchases of food and non-alcoholic beverages are made in supply source 8 Retail trade. The second significant supply source is Crafts and trades (14%): In this case, the purchases are made predominantly by bakers and butchers who mostly produce their own goods. The main statistical sources are the business register, the trade statistics and the census of crafts and trades.

SEA 02 Alcoholic beverages, tobacco and narcotics

Purchases of alcoholic beverages were made mostly in the retail trade. The main statistical sources are therefore the business register and the trade statistics. A special assessment is carried out for tobacco, based on the tobacco tax statistics. Tobacco is sold in the retail trade and wholesale trade (operators of cigarette vending machines). Sales of narcotics (model calculation) are allocated to the retail trade.

SEA 03 Clothing and footwear

With a figure of 95%, the retail trade is also the main supplier of clothing and footwear. The main statistical sources are therefore the business register and the trade statistics.

SEA 04 Housing, water, electricity, gas and other fuels

This item is composed predominantly of the two supply sources Housing services (78%) and Energy supply (16%). The calculation of housing services is described in detail in section 3.18. One of the main data sources is the 2011 population and housing census. Housing services also include service charges, e.g. for water supply. Energy purchases by households are calculated separately in special assessments for gas, electricity, district heating, liquid gas, fuel wood and coal in supply source Energy supply. The main source is the Working Group on Energy Balances. In addition, heating oil, which is also the subject of a special assessment, is purchased in both the retail and the wholesale trade.

SEA 05 Furnishings, household equipment and routine household maintenance

The purchases of furniture and household equipment are made mainly in the retail trade, but also directly from furniture manufacturers in crafts and trades (joiners) or in industry. The main statistical sources are therefore the business register, the trade statistics and the census of crafts and trades. Domestic help services and other household services, e.g. the chemical cleaning of carpets and soft furnishings, which are also to be allocated to SEA item 05, originate from supply source 15 Other services.

SEA 06 Health

Medical and therapeutic appliances are purchased predominantly in supply source 8 Retail trade. The main statistical sources are the business register and the trade statistics. Health services is a second major supply source and provides inpatient and outpatient healthcare services. The main data sources are hospital statistics, care statistics, VAT statistics and cost-structure surveys. It does not include the services of the statutory health insurance system, which form part of general government consumption expenditure.

SEA 07 Transport

The purchases of transport goods are of a more varied nature than the other purposes: Purchases of motor vehicles, purchases of vehicle spare parts and vehicle repairs are recorded in supply source 6 Trade in and repair of motor vehicles. Purchases of automotive fuel and bicycles are made in the retail trade, which also includes filling stations, with a special assessment being performed for automotive fuel. Some of the transport services, such as passenger transport by rail or by air, originate from supply source 9 Transportation and storage. Others, such as the rental of motor vehicles, originate from Other services (supply source 15). The main sources are data from the Federal Motor Transport Authority, the business register, the trade statistics and the service structure survey.

SEA 08 Communication

All the telecommunications services in SEA item 08 Communication come from supply source 11 Information and communication, while the corresponding equipment, e.g. telephones, is purchased in supply source 8 Retail trade. Postal services originate from supply source 9 Transport. The main data sources are the service structure survey, the business register and the trade statistics.

SEA 09 Recreation and culture

A distinction should also be made in this area between goods and services: Photographic equipment, games, musical instruments, camping equipment and all

other products that are allocated to this item are purchased in supply source 8 Retail trade. Cinema visits and payments to broadcasters originate from supply source 11 Information and communication. Theatre and museum visits, for example, or expenditure on betting and lotteries are calculated under supply source 15 Other services. The main data sources are the service structure survey, the business register and the trade statistics.

SEA10 Education

Households pay many educational institutions directly, whether they be in the private sector (supply source 15 Other services), the public sector (supply source 16 General government) or establishments that are classified as non-profit institutions (supply source 17). The main data sources are surveys of schools and private childcare facilities, the financial statistics relating to the public budgets, the VAT statistics and the business register.

SEA 11 Restaurants and hotels

With a figure of 90%, hotels and restaurants (supply source 10) are the dominant supply source for this purpose. Since many butchers and bakers also offer food and drink, and these goods are recorded under supply source 4 Crafts and trades, this supply source accounts for 5% of these services. The main data sources are the business register, the annual survey of the hotels and restaurants industry and the census of crafts and trades.

SEA 12 Miscellaneous goods and services

This item brings together a large number of different goods and services. The most prominent are the services, including FISIM, of supply source 12 Financial and insurance activities, which account for 51% of this purpose. Personal care products and personal effects come from supply source 8 Retail trade, while personal care and prostitution services originate from supply source 15 Other services. Social protection services are calculated mainly under supply source 14 Health services and social work activities.

- 5.63 The **supply sources** are summarised in the tables above. Each supply source is subdivided to a much greater level of detail in the accounts. A detailed subdivision – in many cases based on five-digit WZ subclasses – is the only way of ensuring an accurate allocation according to purpose (SEA) and thus also the correct allocation to prices for price adjustments. The following table gives an insight into the level of detail of the calculation of consumption.

Table 5–5: Household final consumption expenditure by supply source

Year 2010

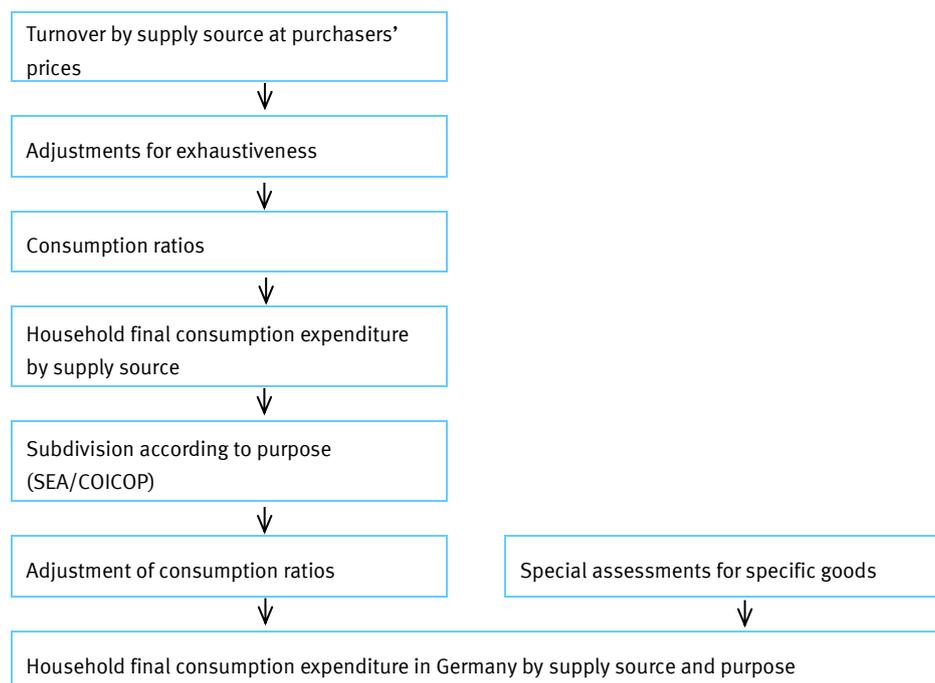
Supply source	Number of sub-categories*	Proportion of consumption expenditure in %
1 Agriculture, forestry and fishing.....	11	0.5
2 Energy supply.....	3	3.8
3 Industry.....	18	0.5
4 Crafts and trades.....	19	2.0
5 Construction.....	7	0.3
6 Sale, maintenance and repair of motor vehicles and motorcycles.....	9	6.0
7 Wholesale trade.....	25	1.8
8 Retail trade.....	55	33.5
9 Transportation and storage.....	27	3.4
10 Hotels and restaurants.....	23	4.5
11 Information and communication.....	23	3.8
12 Financial and insurance activities including FISIM.....	7	6.2
13 Housing services**.....	433	18.9
14 Health services and social work activities.....	18	4.2
15 Other services.....	95	6.9
16 General government.....	14	0.9
17 Non-profit institutions.....	8	0.5
Consumption expenditure by residents of Germany in the rest of the world.....	3	4.2
Consumption expenditure in Germany by residents of other countries.....	3	1.8
Household final consumption expenditure (national concept).....		100

* excluding special assessments, with the exception of supply sources 2, 12 and 13.

** 431 strata and service charges reviewed for rented and owner-occupied dwellings

- 5.64 Fundamentally, for each supply source, the first step is to calculate the turnover, including VAT and other taxes on products, and all the adjustments for exhaustiveness. Next, the consumption ratios, i.e. the proportions of sales accounted for by households, are determined. This is followed by a subdivision according to purpose and, if necessary, a revision of the sales ratios. In addition, the special assessments, which mainly consist of a quantity-price calculation, are integrated.

Figure 5–1: Calculation scheme for household final consumption expenditure in Germany



- 5.65 Special assessments are carried out for some types of goods, because better statistics are available for them than the supply source statistics or the supply source statistics are unable to provide appropriate data. The special assessments are integrated within appropriate supply sources, as shown in the following Figure 5–2:

Figure 5–2: Special assessments in appropriate supply sources

Special assessment		Integrated predominantly in supply source ...
Gas, electricity, district heating.....	2	Energy supply
Fuel wood	8/7	Retail and wholesale trade
	1	Agriculture and forestry
Liquid gas, solid fossil fuels.....	8/7	Retail and wholesale trade
Heating oil	8/7	Retail and wholesale trade
Tobacco	8/7	Retail and wholesale trade
Narcotics.....	8	Retail trade
Motor vehicles	6	Motor trade
Fuels	8	Retail trade
Prostitution	15	Other services
Housing services.....	13	Housing services
Betting and lotteries	15	Other services
FISIM.....	12	Financial services

5.7.2 Main sources and transition to national accounts concepts

Use of supply source data instead household surveys

- 5.66 Household consumption expenditure is calculated according to the supplier approach. To this end, structure surveys, administrative sources, the business register and a

number of other data sources are evaluated. Source statistics, e.g. from economic surveys of trade, are also available for quarters that are the focus of economic monitoring. It is necessary that the source statistics should provide quarterly data, because annual and quarterly results are drawn up and integrated within the German national accounts. The special assessments for certain goods in terms of volume/price calculations are carried out using alternative data sources. In addition, the results of household budget surveys are used for the calculation of housing service charges and for comparison with the supply source results.

- 5.67 There were several reasons for deciding to use a supply source approach, and not household surveys, as the basis for calculating household final consumption expenditure. In Germany, there are two household budget surveys: The Income and Consumption Sample Survey (EVS) and the continuous household budget surveys (LWR).
- 5.68 The **Income and Consumption Sample Survey** takes place every 5 years and the results are published after approximately 2 years. The central feature of the Income and Consumption Sample Survey is the keeping of household records by the respondents over a period of 3 months. All income and expenditure in the reporting months should be entered in household records in a high level of detail (generally 4-digit COICOP categories; in the case of food, only 2 or 3-digit COICOP categories). Participation by the respondents in the Income and Consumption Sample Survey is voluntary. As a result of the very low willingness of households in the higher income brackets to participate in the survey, it only includes households with a monthly household income of less than EUR 18 000. As part of the Income and Consumption Sample Survey 2008, 55 110 households kept household records.
- 5.69 There was an equal distribution of the records over time, with the households taking part in the survey being divided equally over the four quarters of the distributed reporting year. Another aspect of the survey consists of the detailed record book for food, beverages and tobacco. One in five of the households taking part in the Income and Consumption Sample Survey compile a detailed list (more detailed than five-digit COICOP subclasses) of all expenditure on food and beverages by quantity and price, for a period of one month. The results of the detailed records are published at a later date than the expenditure noted in the household records.
- 5.70 The Income and Consumption Sample Survey can only be used for the national accounts for the purposes of comparison, and not as a basis for calculation. This is because
- the 5-year cycle of the survey and its publication nearly 2 years after its completion mean that it is impossible to incorporate any up-to-date survey results in the national accounts. They are also of little use as benchmarks in major revisions. For example, the results of the 2008 Income and Consumption Sample Survey were not fully available for the 2011 revision, because the results of the detailed records only appeared in the course of 2011, and were thus too late to be integrated. For the 2014 revision, the most up-to-date results were still those of the 2008 Income and Consumption Sample Survey and were therefore too old to be used for benchmarking, especially after the economic crisis of 2009.
 - the Income and Consumption Sample Survey cannot provide an undistorted picture of the entire population, since it is implemented as a quota sample and does not take account of households with a monthly net income of EUR 18 000 or over. According to the results of a feedback questionnaire, households taking part in the Income and Consumption Sample Survey have a high intrinsic motivation to participate and often keep household records for

their own personal use. It therefore seems likely that these households would display a particular type of consumption and savings behaviour. This would be reflected in both the level and the structure of their expenditure.

- certain categories of expenditure are generally under-reported in household surveys, because they are recorded incompletely on account of errors or lapses in memory on the part of household members (e.g. expenditure without till receipts) or of a lack of willingness to participate by individual household members (e.g. young people), because the households are reluctant to record them (e.g. alcohol, tobacco, prostitution), or because the reporting period of 3 months is not sufficient to produce valid results based on reasonable sample numbers (in the case of infrequent expenditure, e.g. the purchase of long-lasting consumer durables)
- quarterly results, which are absolutely necessary for economic monitoring and thus the quarterly calculations of consumption expenditure, are not published.

5.71 The following table shows a comparison of household final consumption expenditure according to the Income and Consumption Sample Survey (EVS) and the national accounts. It should be noted that

- these are the published values in each case and have not been adjusted for differences in approach. These results are therefore not fully comparable with one another.
- the Income and Consumption Sample Survey reports its results by purpose (SEA) according to the national concept, while the national accounts use the domestic concept. In the national accounts, for a comparison of the overall results, consumption expenditure in the rest of the world by residents of Germany must be added while consumption expenditure in Germany by residents of other countries must be subtracted.

5.72 The table shows that consumption expenditure according to the Income and Consumption Sample Survey equals approximately 77% of the figure in the national accounts. The use of the supply source approach in the national accounts produces a result that is around EUR 319 bn higher than that of the Income and Consumption Sample Survey. The Income and Consumption Sample Survey only gives a higher figure in the area of housing services, which may be because expenditure on housing services is a fixed and known amount for households which is unlikely to be under-reported in the survey. Housing services are therefore assigned not only a proportionately high level of importance in the Income and Consumption Sample Survey, but also a high absolute value.

Table 5–6: Comparison of household final consumption expenditure in the Income and Consumption Sample Survey (EVS) and the national accounts

Year 2008

SEA	Purpose	EVS	National accounts	EVS proportion in national accounts
		EUR bn		%
01	Food and non-alcoholic beverages.....	133.04	144.56	92
02	Alcoholic beverages, tobacco and narcotics	18.77	43.93	43
03	Clothing and footwear.....	49.91	67.61	74
04	Housing, water, electricity, gas and other fuels.....	345.83	334.03	104
05	Furnishings, household equipment and routine household maintenance	53.43	84.86	63
06	Health	44.30	61.57	72
07	Transport	155.26	191.93	81
08	Communication.....	30.80	38.70	80
09	Recreation and culture.....	120.73	131.08	92
10	Education.....	9.56	10.25	93
11	Restaurants and hotels	53.20	67.04	79
12	Miscellaneous goods and services	46.64	167.69	28
	+ Consumption expenditure by residents of Germany in the rest of the world		61.84	
	+ Consumption expenditure in Germany by residents of other countries.....		24.96	
	Household final consumption expenditure, total	1 061.46	1 380.12	77

5.73 With around 8 000 sample households, the **continuous household budget surveys**, which are also carried out as quota samples, are designed to fill the gaps in the data between two Income and Consumption Sample Surveys. They are carried out every year, except in those years in which the Income and Consumption Sample Survey is conducted. As with the Income and Consumption Sample Survey, the central element of the continuous household budget surveys is the recording of all income and expenditure in household records over a period of 3 months. Compared to the Income and Consumption Sample Survey, expenditure is generally recorded in a more detailed manner (typically to a level of detail beyond five-digit COICOP subclasses; in the case of food, only 2 or 3-digit categories). All households participate on a voluntary basis. The continuous household budget surveys are always a sub-sample of the most recent Income and Consumption Sample Survey. Households of self-employed persons and agricultural households are not part of the population for the continuous household budget surveys and are therefore not surveyed. On account of the uniform distribution of the sample households over the year, each quarter only around 2 000 households report their income and expenditure in household records.

5.74 The continuous household budget surveys can only be used as a source for the national accounts if no other source statistics are available and the expenditure categories are not affected by under-reporting. Otherwise, the continuous household budget surveys cannot serve as a basis because

- the small number of households surveyed – 2 000 quarterly or 8 000 annually – restricts the validity of the results on the level and structure of household expenditure (especially with a more detailed subdivision),
- self-employed persons and farmers (around 11% of the workforce in 2010) are excluded by definition,

- as with the Income and Consumption Sample Survey, households with a monthly net household income of EUR 18 000 or more are not taken into account,
- certain categories of expenditure are generally under-reported in household budget surveys (see above)
- no data is available for specific quarters,
- data for the current year only becomes available with a relatively long time lag of more than one year, on account of the large amount of time required for data processing.

Main sources for turnover

- 5.75 The starting point for the calculations of household final consumption expenditure is data on the turnover of the various supply sources. The principal sources of turnover data are the business register (EVAS 52111), the structural survey in the service sector (EVAS 47415), the VAT statistics (EVAS 73311), the census of crafts and trades (EVAS 53111) and the annual surveys in the wholesale and retail trade and in the annual statistics of accommodation and food service activities (EVAS 45341, 45342). A wide variety of allowances are applied to the source statistics to ensure exhaustiveness. The sections on the individual supply sources contain detailed descriptions of the sources and the calculations, including the allowances for exhaustiveness.

Main sources for consumption ratios

- 5.76 The availability of data for the determination of consumption ratios is very varied. For the wholesale and retail trade, which supplies 41% of the total goods and services consumed by households and is thus the main supply source (2010), turnover figures according kind of turnover are available in the annual survey of the wholesale and retail trade (EVAS 45341). In this survey, the turnover is categorised by retail trade, wholesale trade and other forms of trade. The questionnaire defines retail turnover as sales revenue deriving chiefly from the supply of goods and services to households.
- 5.77 In the second-largest supply source, namely housing services, which comes under the heading of real estate, renting and business activities and accounts for 19% of household final consumption expenditure in 2010, fixing a private-consumption ratio poses no problems. Since, by definition, the renting and owner-occupation of living accommodation is to be allocated to household final consumption expenditure, the output of this area of activity plus service charges and second home tax must be recorded.
- 5.78 The relevant survey by the Deutsche Bundesbank contains data on the proportions of household expenditure for travel expenditure abroad (4% of household final consumption expenditure). For many important areas of public health and social work activities and of education (2010: 5% of household final consumption expenditure), the determination of the volume of supplies to households is substantiated by statistics, because the payments made by the state can be deducted from the turnover of these healthcare or educational institutions to give the household final consumption expenditure.
- 5.79 The consumption expenditure of households can be reliably defined in most of the special product-by-product assessments. For instance, data on new registrations of motor vehicles for households is provided by the Federal Motor Transport Authority (Kraftfahrtbundesamt). Sales of electricity and gas to households can be taken from the data of the Working Group on Energy Balances. In the realm of public administration, finally, highly itemised information is available from the fiscal statistics of the Federal Government, the federal states and the municipalities (EVAS 711) on the value of services rendered to households.

5.80 This means that data on private-consumption ratios or consumption expenditure is available for around 80% of the consumption expenditure of households in Germany. In the remaining cases, especially household purchases from service companies, private-consumption ratios are assessed with the aid of every available official and unofficial source of data, such as companies' annual business reports and surveys conducted by the umbrella organisations for particular industries. This shows that evidence of turnover, itemised by category of economic activity, provides firm enough foundations for the assignment of goods and services to specific types of end user and for the calculation of plausible private-consumption ratios. In some cases, direct estimates of household consumption have been made with the aid of specific assumptions or after consultation with umbrella organisations for particular industries. An important cross-check of the ratios is effected through reconciliation with the input-output accounts and the household-budget surveys.

The sections on the individual supply sources contain detailed descriptions of the data sources and the calculations.

Main sources for the special assessments

- 5.81 The main sources for the above special assessments are
- for the calculation of housing services: the 2011 population and housing census (EVAS 31211);
 - for energy purchases: data from the Working Group on Energy Balances;
 - for purchases of cars: data from the Federal Motor Transport Authority on new registrations and re-registrations of motor vehicles;
 - for purchases of automotive fuel: the mileage statistics of the German Institute for Economic Research in conjunction with data from the Federal Motor Transport Authority,
 - for purchases of cigarettes and tobacco: the tobacco tax statistics (EVAS 79911);
 - for financial and insurance activities: data from the banking or insurance supervisory authority.

5.7.3 Calculations by supply source and special assessments

5.82 Household final consumption expenditure in Germany is calculated according to supply source, supplemented by special assessments. This is followed by a classification according to purpose, using the purposes in SEA/COICOP. For this reason, the following representation of the methodology used is divided according to supply sources. The calculation results for household final consumption expenditure in 2010 were subjected, like other aggregates of the national accounts, to cyclical balancing (see also Chapter 6).

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	1 410.792
Reconciliation	-3.803
Amount after reconciliation.....	1 406.989

5.7.4 Supply source 1 Agriculture, forestry and fishing

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	7.111
Amount after reconciliation	7.084

- 5.83 Supply source 1 Agriculture, forestry and fishing primarily concerns the production of agricultural products, e.g. fruit, vegetables, milk, meat, eggs, wine, fish or timber. The majority of these products are initially purchased by enterprises in the food industry, the catering industry or the wholesale/retail trade. A small proportion of the output is sold directly by farms to households (direct sales) or consumed by the agricultural households themselves (own consumption). In addition, non-agricultural households also produce agricultural products in their gardens (domestic horticultural production) and fuel wood is obtained from forests.

Consumption expenditure in 2010	EUR bn
Direct sales	4.197
Own consumption	0.487
Domestic horticultural production	1.942
Fuel wood.....	0.485
Total (assessed amount).....	7.111

Direct sales

- 5.84 Farms sell a proportion of their products directly to their customers. An important data source for these sales is the Economic Accounts for Agriculture (EAA), which are compiled by the Federal Office for Agriculture and Food (BLE). The BLE calculates the direct sales in a deep breakdown by crop and livestock products, excluding VAT. A consumption ratio is determined for each agricultural product, to enable the household final consumption expenditure to be derived. Finally, the calculated consumption expenditure is supplemented by the VAT according to the VAT statistics (EVAS 73311). The VAT statistics (EVAS 73311) are used as a further data source for direct sales. For eight economic activities that are not yet covered by the BLE calculations, the turnover data including VAT is used. The most important economic activity in this respect is WZ 01.21 Growing of grapes. Consumption ratios are also determined in this area for the calculation of consumption expenditure.

Own consumption

- 5.85 Agricultural households consume a proportion of their agricultural products themselves. The data source for this consists of the Economic Accounts for Agriculture compiled by the BLE. The BLE calculates own consumption in a deep breakdown by crop and livestock products.

Domestic horticultural production

- 5.86 The agricultural products produced by kitchen gardens and private livestock husbandry solely for personal use are described as domestic horticultural production. It is also calculated by the BLE for individual goods, e.g. fruit, vegetables, flowers, ornamental plants, eggs and honey.

Fuel wood

- 5.87 The calculation of purchases of fuel wood will be explained under the special assessments, because the values are divided among on several supply sources (see section 5.7.30).

5.7.5 Supply source 2 Energy supply

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	53.932
Amount after reconciliation	53.725

- 5.88 This supply source covers the supply of electricity, gas and district heating to households. The suppliers are the power supply enterprises.

Consumption expenditure in 2010	EUR bn
Electricity	31.127
District heating.....	4.469
Gas.....	18.336
Total (assessed amount).....	53.932

Electricity

- 5.89 The data source for the volume of electricity consumed by households is the annual energy balance of the Working Group on Energy Balances. The Working Group on Energy Balances comprises seven German energy industry associations and three institutions active in energy management research. It evaluates the available statistics from all areas of the energy industry, compiles energy balances and makes them available to the public. Every year, the Working Group on Energy Balances prepares an energy balance for the Federal Republic of Germany. This provides a comprehensive and detailed picture of the volumes of energy produced in Germany, traded with foreign countries and consumed domestically.

The volume of electricity consumed is valued using the price for tariff customers from the survey of electricity sales and sales proceeds by electricity suppliers and traders (EVAS 43331). The price includes the electricity tax and the Renewable Energies Act surcharge, but not the VAT, which is subsequently taken into account separately.

District heating

- 5.90 The volume of district heating consumed by households is also taken from the energy balances of the Working Group on Energy Balances. Prices are provided by AGFW 'The Energy Efficiency Association for District Heating, Cooling and Combined Heat and Power' (overview of district heating prices); VAT is added.

Gas

- 5.91 The source for the calculation of household final consumption expenditure on gas, in terms of volumes and prices, is the annual survey of the generation and sale of gas (EVAS 43341). Gas sales to household customers are valued using the average annual price taken from the above statistics and the VAT. The natural gas tax is included in the price.

5.7.6 Supply source 3 Industry

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	6.470
Amount after reconciliation	6.444

- 5.92 This consumption expenditure concerns direct purchases by households from enterprises in the areas of mining and manufacturing.

Consumption expenditure in 2010	EUR bn
Staff sales	1.743
Factory shops.....	4.026
Payments in kind.....	0.702
Total (assessed amount).....	6.470

Staff sales

- 5.93 Staff sales are where companies sell their products to their own staff, in some cases at a discount. One example is the large-scale sale of passenger cars by car manufacturers to their own employees. The numbers of cars sold to employees and the discounted prices are elicited directly from the car manufacturers, please see Special assessment for motor vehicles.
- 5.94 In addition, other manufacturing enterprises sell goods to their workforce. This calculation of staff sales is based on a model calculation covering the following consumer-related areas of manufacturing:
- Manufacture of food products and tobacco
 - Manufacture of textiles and textile products
 - Manufacture of leather and leather products
 - Manufacture of wood
 - Manufacture of pulp, paper and paper products; publishing and printing
 - Manufacture of chemicals, chemical products and man-made fibres
 - Manufacture of rubber and plastic products
 - Manufacture of glass and glass products, ceramic goods and other non-metallic mineral products
 - Manufacture of basic metals and fabricated metal products
 - Manufacture of machinery and equipment n.e.c.
 - Manufacture of office machinery, computers and electrical machinery and equipment
 - Manufacture of transport equipment
 - Manufacture of furniture, jewellery, musical instruments, etc.
- 5.95 It is assumed that the employees of companies in the activity categories listed above satisfy their needs in terms of their respective companies' products by buying these products from their employers, not only for themselves but for their entire household. The number of persons covering their own needs through staff purchases is derived from the number of employees (monthly report for local units in manufacturing, EVAS 42111) in the particular area of economic activity and the average size of household given in the microcensus (EVAS 12211). A reduction allows for the possibility of more than one household member working for the same company. The second element, which is the average consumption of all households, is determined by reference to the domestic turnover of the relevant area of economic activity per inhabitant, taking into account the average size of household. This average household consumption figure is then increased slightly, because it may be assumed that employees' consumption of their companies' own products will exceed the national average consumption of the products in question. The value of staff sales, which is the product of the number of employees, the average consumption of all households and the adjustment factor, is then reduced, on the basis of an estimate, by the total amount of discount granted to employees and increased by the appropriate amount of VAT.
- 5.96 Furthermore, direct purchases of beer are calculated separately based on information from the German Brewers Association. For discounted purchases in the service sector, the results of the calculation of compensation of employees are used, which are in turn based on the results of the labour cost survey (EVAS 62411).

Factory shops

- 5.97 In the industrial domain, manufacturers may market their products directly through their own sales outlets, i.e. without the involvement of commercial enterprises. To estimate the turnover of these shops, we calculated the turnover per employee for each comparable category of retail trade from the annual retail survey (EVAS 45341)

and multiplied it by the number of employees in the relevant sales outlets. Since these outlets do not sell exclusively to households, the private-consumption ratios for the corresponding categories of retail trade are used to calculate the value of direct sales to households. Subsequent turnover figures are extrapolated with the aid of the rates of turnover growth in the relevant categories of retail trade (see Supply source 08 Retail trade).

Payments in kind

- 5.98 In addition to staff sales, which represent a purchase at a discount, goods are also distributed free of charge to employees. These include, for example, miners' coal allowances and the provision of free beer to brewery employees. Data on the miners' coal allowances are derived from the statistics of the Coal Industry Association (Kohlenwirtschaft e.V.). This association is responsible for compiling the summary statistics required by the authorities in connection with the coal industry. The quantities are valued using prices from the statistics of the price indices for commercial products. The provision of free beer to brewery employees is identified using the statistics on the excise duty on beer (EVAS 79921). Moreover, the provision by employers of sporting and leisure facilities for their employees, and other payments in kind, should also be included as benefits in kind in the value of wages and salaries. Figures are estimated on the basis of the labour cost survey (EVAS 62411).

5.7.7 Supply source 4 Crafts and trades

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	28.071
Amount after reconciliation.....	27.965

- 5.99 Craft enterprises are businesses owned by self-employed persons who appear in the register of craft businesses or in the directory of crafts and trades that may be operated without a licence. According to the Classification of Economic Activities, they are classified under Manufacturing and are spread over a variety of economic activities. Craft enterprises sell their products and services in part directly to households; this applies in particular to butchers (WZ 10.13.0 Production of meat and poultry meat products) and bakers (WZ 10.71.0 Manufacture of bakery and farinaceous products). The source for the turnover is an annual evaluation of the data on craft enterprises derived from administrative data, which is referred to as the census of crafts and trades (EVAS 53111). The turnover is available in a level of detail down to five-digit WZ subclasses and is supplemented by adjustments for exhaustiveness for small businesses and the hidden economy. The adjustment for small businesses is necessary because the administrative data does not include enterprises with an annual turnover of less than EUR 17 500. The source for the allowance consists of the statistics on VAT assessments (EVAS 73312), which contain data on the turnover of small businesses. During the revision in 2014, the most recent available statistics on VAT assessments were from 2008. The adjustments for the hidden economy are based on a hidden economy model which is explained in detail in Chapter 7. Furthermore, VAT is added (VAT statistics, EVAS 73311), consumption ratios are determined and consumption expenditure is then calculated. This shows that evidence of turnover, itemised by category of economic activity, provides firm enough foundations for a calculation of plausible consumption ratios.

WZ 2008, Consumption expenditure in 2010	EUR bn
10130 Production of meat and poultrymeat products.....	9.807
10710 Manufacture of bakery and farinaceous products.....	13.569
Other craft enterprises.....	4.695
Total (assessed amount).....	28.071

5.7.8 Supply source 5 Construction

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	4.841
Amount after reconciliation.....	4.823

- 5.100 In terms of household expenditure on the maintenance of dwellings, it is necessary to distinguish between minor cosmetic repairs and repairs for the maintenance and improvement of the dwelling, which are not typically carried out by tenants. Only the former category of repairs should be allocated to consumption expenditure.
- 5.101 The basis for the calculation, as with supply source 4 Crafts and trades, is the annual census of crafts and trades (EVAS 53111), which has already been described in supply source 4 Crafts and trades. These statistics provide information on turnover for the relevant categories of electrical installation, plumbing, heat and air-conditioning installation, joinery, floor and wall covering, painting and glazing. Allowances for the hidden economy and small businesses (for an explanation please see supply source 4 Crafts and trades), tips (estimated) and VAT (VAT statistics, EVAS 73311) are added to the turnover, consumption ratios are determined and consumption expenditure is calculated. The determination of consumption ratios takes account of the fact that the vast majority of the turnover of craft enterprises in the construction industry companies is either of the nature of capital formation, and thus comes under investments in construction, or of the nature of intermediate consumption in the area of housing services. As a result, the consumption ratios should be set at a very low level. Only in the category of painting may it be assumed that a considerable proportion of turnover is derived from purely cosmetic repairs to the dwelling and thus represents household final consumption expenditure.

WZ 2008, Consumption expenditure in 2010	EUR bn
43341 Painting	2.328
Other craft enterprises in construction	2.513
Total (assessed amount).....	4.841

5.7.9 Supply sources 6-8 Trade, 10 Hotels and restaurants

Supply source accounting for trade and for hotels and restaurants (supply sources 6, 7, 8 and 10)

The following explanations apply to the motor trade, wholesale trade, retail trade and to hotels and restaurants.

- 5.102 Various sources may be considered for determining **turnover** for trade and for hotels and restaurants: The VAT statistics (EVAS 73311), the annual survey of the wholesale and retail trade (EVAS 45341), the annual survey of the hotels and restaurants sector (EVAS 45342) and the business register (EVAS 52111). The VAT statistics are an administrative source based on advance VAT returns to the fiscal authorities. The fiscal authorities are not primarily concerned with a precise classification according to economic activity. This means, for example, that entire groups of companies (tax groups), rather than their individual constituent enterprises, will be allocated to a particular economic activity. For this reason, the allocation to economic activities used in the VAT statistics and the associated results are less suitable for national accounts purposes. The business register is based on the VAT statistics, among other things, but divides the groups into individual enterprises and allocates them to economic activities. The basic checking of the allocation of enterprises to economic activities leads to better results in the business register for these economic activities. The

annual surveys of the wholesale and retail trade and of the hotels and restaurants sector are in turn samples from the business register. The business register and the annual surveys are therefore to be preferred as sources for VAT statistics. All three sources reported the following turnover for 2010:

Turnover excluding VAT, 2010, EUR bn

NACE	Annual survey	VAT statistics	Business register
45-47 Trade	1 670.59	1 652.6	1 676.85
55, 56 Hotels and restaurants	63.62	62.93	66.79
Total	1 734.21	1 715.53	1 743.64

- 5.103 The business register shows the highest total figure, which is close to the data in the annual survey. The VAT statistics are significantly lower. The business register was selected as the data source, because it provides better systematic industry classification than the VAT statistics and therefore probably delivers more exhaustive results than the annual survey. In the years prior to 2010, the turnover figures in the annual survey were lower than the figures in the two other sources by an even more significant margin and were not considered as possible baseline values for the national accounts. From 2010 onwards, the turnover figures in the business register now serve as baseline values both in the calculation of household final consumption expenditure and in the calculation of gross value added. The calculation of consumption expenditure is at a level of detail equivalent to five-digit WZ subclasses. The figures in the business register become available in each case after t+3 years.
- 5.104 To obtain purchasers' prices, the VAT must be added, as the turnover in the business register is exclusive of VAT. The VAT statistics show tax rates by economic activity, which can be used to calculate gross turnover.
- 5.105 **Adjustments for exhaustiveness** include allowances for small businesses, for tips and for the hidden economy. The adjustment for small businesses is necessary because the business register does not include enterprises with an annual turnover of less than EUR 17 500. The source for the allowance consists of the statistics on VAT assessments (EVAS 73312), which display data on the turnover of small businesses. During the revision in 2014, the most recent available statistics on VAT assessments were from 2008. Tips are added by estimation if they are usual. The adjustments for the hidden economy are based on a hidden economy model which is explained in detail in Chapter 7. They are calculated for two-digit WZ divisions, further subdivided into five-digit subclasses and used in the accounting of consumption. Further special allowances for exhaustiveness are explained under the corresponding supply sources.
- 5.106 Next, the **consumption ratios** are determined. The annual survey of the wholesale and retail trade (EVAS 45341) asks enterprises to specify which customer groups they sell their goods and services to (=trade function). This includes the 'retail trade' function, which reflects sales to households and forms the starting point for the calculation of the consumption ratios. For traders, not all company purchases are recognisable as such; some are also reported as private purchases. The consumption ratios are therefore also adjusted for these purchases. These adjustments, however, are not made in the WZ classification, but in the subsequent calculation according to purpose. For the classification by purpose, the annual survey of the wholesale and retail trade provides data on the product range of wholesale/retail enterprises (approximately 80 types of goods and services). This level of detail in the data makes it possible to record hidden company purchases as effectively as possible, using adjustment ratios specific to the types of goods or services. By applying the consumption ratios that have been

modified in this way, the volume of sales to households can be calculated for each five-digit WZ subclass.

All the other processing steps differ according to the area or trade or the hotel and restaurant sector and are explained below individually.

5.7.10 Supply source 6 Trade and repair of motor vehicles

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	84.046
Amount after reconciliation	83.730

- 5.107 Supply source 6 Trade and repair of motor vehicles covers the wholesale and retail trade and the repair of motor vehicles. It is largely determined by the motor trade supply source account and the special assessment for motor vehicles. In addition, smaller values from the special assessments for automotive fuel, tobacco, heating oil and liquid gas are incorporated in this calculation.

Consumption expenditure in 2010	EUR bn
Trade and repair of motor vehicles supply source account.....	30.990
Special assessment for motor vehicles	52.642
Other special assessments	0.414
Total (assessed amount).....	84.046

Trade and repair of motor vehicles supply source account

- 5.108 As described above, data from the business register, supplemented by VAT and adjustments for exhaustiveness, is used to determine turnover in the trade and repair of motor vehicles. In addition to the adjustments for small businesses and the hidden economy, there are also adjustments for tips. Tips are quite common in motor vehicle repair shops, but represent a fairly low proportion of turnover. They are estimated at 0.5% of turnover in WZ 45.20.3 "Maintenance and repair of motor vehicles with a weight not exceeding 3.5 t" and added accordingly. The calculation is based on nine five-digit WZ subclasses.
- 5.109 The consumption ratios are determined, as described above, with the aid of the annual survey of the wholesale and retail trade. It should also be noted that some of the turnover is generated from repair costs borne by the insurance companies. Since only the service charge is recorded under insurance, and not the gross premiums, repair payments by insurance companies are to be recorded as consumption expenditure in the motor trade.

Special assessments

- 5.110 Special assessments are carried out for motor vehicles, automotive fuel, tobacco, heating oil and liquid gas. To this end, the corresponding values for these goods are initially taken from the supply source account. The values for these goods resulting from the special assessments are divided by supply source and also incorporated in supply source 6 trade and repair of motor vehicles. The special assessments will be explained in more detail below.

5.7.11 Supply source 7 Wholesale trade

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	25.596
Amount after reconciliation	25.500

- 5.111 The wholesale trade primarily exercises an intermediary function, so the proportion of direct purchases by households in the wholesale trade is very low.

Consumption expenditure in 2010	EUR bn
Wholesale trade supply source account.....	10.258
Special assessment for tobacco.....	10.095
Special assessment for heating oil.....	3.545
Other special assessments	1.698
Total (assessed amount).....	25.596

Wholesale trade supply source account

- 5.112 As described above, data from the business register, supplemented by VAT and adjustments for exhaustiveness (small businesses, hidden economy), is used to determine turnover in the wholesale trade. The annual survey of the wholesale and retail trade is used, as described above, to determine the consumption ratios. The calculation is based on 25 five-digit WZ subclasses.

Special assessments

- 5.113 The sale of tobacco via vending machines is allocated to the wholesale trade; heating oil is also largely distributed via the wholesale trade. To a lesser extent, automotive fuel is also purchased from the wholesale trade. The calculation of consumption expenditure for these goods is explained under the individual special assessments.

5.7.12 Supply source 8 Retail trade

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	473.242
Amount after reconciliation	471.456

- 5.114 Most household purchases are made via the retail trade: in 2010, purchases in the retail trade constituted around one third of household final consumption expenditure. The calculations were composed of the supply source account and various special assessments. The special assessment for automotive fuel should be highlighted here, since filling stations form part of the retail trade and in the case of agency filling stations (WZ 47.30.1 Retail sale on behalf of others of automotive fuel in specialised stores) it is only the commission on the sale of fuel that is initially recorded as automotive fuel turnover. The fuel purchases themselves must be added in this case.

Consumption expenditure in 2010	EUR bn
Retail trade supply source account	403.364
Special assessment for automotive fuel.....	47.649
Special assessment for tobacco.....	11.677
Special assessment for heating oil.....	6.572
Other special assessments, including narcotics.....	3.980
Total (assessed amount).....	473.242

Retail trade supply source account

- 5.115 As described above, data from the business register, supplemented by VAT and **adjustments for exhaustiveness**, is used to determine turnover in the retail trade. The adjustments for exhaustiveness primarily concern allowances for
- small businesses and hidden economy (as described above),
 - cross-border mail order purchases
 - purchases of automotive fuel
 - tobacco smuggling
 - purchases of narcotics
- The calculation is based on 55 five-digit WZ subclasses.
- 5.116 For some years, purchases from abroad by means of orders placed over the Internet, i.e. **cross-border mail order purchases**, have been growing at a rapid pace. In principle, these purchases are included in the turnover figures in the trade statistics. In some cases, retailers operate an Internet-based/mail order business in addition to their physical stores; this turnover is allocated to the corresponding WZ class according to the main focus of the physical stores. In other cases, retailers operate a primarily or exclusively Internet-based/mail order retail business. Their turnover may be found in WZ 47.91.1 Retail sale of textiles and clothing via mail order houses or via Internet and 47.91.9 Other retail sale via mail order houses or via Internet. If manufacturers supply households directly via mail order, this is covered by the model calculation of supply source 3 Industry.
- 5.117 Purchases via mail order houses domiciled abroad are, however, also increasing. In some cases these mail order houses sell goods under their own name, while in other cases they act as an Internet platform and are therefore operating as a commercial intermediary. If purchases are merely being arranged by an intermediary, they will already be recorded for the other traders or manufacturers. If, however, the mail order houses sell the goods under their own name, these goods will initially not be recorded either under domestic purchases or under travel expenditure. A supplementary estimation of these transactions is carried out by the Deutsche Bundesbank in the balance of payments statistics and is included in the calculation of household final consumption expenditure.
- 5.118 Mail order purchases made in Germany by households in other countries are included in the turnover figures in the trade statistics and the business register and in the reports on foreign trade statistics. They are incorporated in the national accounts as exports of goods. They are to be eliminated from retail trade turnover, because although they are initially included in the turnover data in the business register they do not represent domestic household final consumption expenditure. The data source consists of the foreign trade statistics (EVAS 51141 intra-Community trade statistics, EVAS 51231 extra-Community trade statistics), which for 2011 analysed the flow of goods by economic activity.
- 5.119 A further allowance for exhaustiveness relates to **agency filling stations** (WZ 47.30.1 Retail sale on behalf of others of automotive fuel in specialised stores), where it is only the commission on the sale of fuel that is initially recorded as automotive fuel turnover. In this case, the fuel purchases themselves are added on the basis of the special assessment for **automotive fuel** (see below).
- 5.120 **Tobacco smuggling and sales of narcotics** both concern illegal activities. They are not surveyed as turnover, but calculated using a model (see Chapter 7) and added to the retail trade. They are to be allocated in full to consumption.
- 5.121 Turnover in the economic activities 47.73.0 Dispensing chemist in specialised stores 47.74.0 Retail sale of medical and orthopaedic goods in specialised stores and

47.78.1 Opticians is reduced by the value of the **payments by the statutory health insurance system** (GKV) which relate to general government purchases. The source for the payments by the GKV consists of the accounting results of the social security funds (EVAS 71712).

- 5.122 Next, the **consumption ratios** are determined. The annual survey of the wholesale and retail trade (EVAS 45341) asks enterprises to specify which customer groups they sell their goods and services to (=trade function). This includes the 'retail trade' function, which reflects sales to households and forms the starting point for the calculation of the consumption ratios. For traders, not all company purchases are recognisable as such; some are also reported as private purchases. Deductions are therefore made in the private-consumption ratios, in particular if total turnover from retail trade includes sales to non-profit institutions not recognised as such and sales to property developers and tradesmen. In addition, jewellery and watches, works of art and antiques are sometimes used as investments, so that some of these purchases come under acquisitions less disposals of **valuables** (see section 5.12 for a description) and not under consumption expenditure, even if they are purchased by households. The consumption ratios are also adjusted for this reason. These adjustments, however, are not made in the NACE classification, but in the subsequent calculation according to purpose. For the classification by purpose, the annual survey of the wholesale and retail trade provides detailed data on the product range of wholesale/retail enterprises (approximately 80 types of goods and services). This level of detail in the data makes it possible to adjust for hidden company purchases as effectively as possible. By applying the calculated consumption ratios, the volume of sales to households can be determined for each five-digit WZ subclass.

	2010, EUR bn
Retail turnover, business register.....	472.199
+ VAT	71.523
+ Adjustments for small businesses, mail order sales, hidden economy	0.471
= National accounts total gross turnover, supply source 8 Retail trade	544.193
– Purchases not included in household final consumption expenditure (purchases by GKV, purchases of valuables, company purchases etc.)	109.131
= Household final consumption expenditure for supply source 8 Retail trade, excluding special assessments	435.062
Comprising: pure retail trade turnover excluding goods in special assessments ..	403.364
Household final consumption expenditure for goods in special assessments.....	69.878
Household final consumption expenditure for supply source 8 Retail trade, including special assessments.....	473.242

Special assessments

- 5.123 In the retail trade, the most significant special assessment is that for automotive fuel with a figure of EUR 47.650 bn.
- 5.124 Filling stations are subdivided into NACE 47.30.1 Retail sale on behalf of others of automotive fuel in specialised stores (filling stations acting as agencies) and NACE 47.30.2 Retail sale of private-brand automotive fuel in specialised stores (independent filling stations). While for independent filling stations the entire turnover of automotive fuel is recorded in the business register and in the annual survey, for agency filling stations it is only the commission on the sale of fuel that is recorded as automotive fuel turnover. The fuel purchases themselves must be added in this case. The complete automotive fuel account is described in detail in the section on the special assessment for automotive fuel. The calculated fuel consumption is allocated to various supply sources, predominantly to supply source 8 Retail trade.

Heating oil

- 5.125 The calculation of purchases of heating oil in a special assessment is explained in more detail below.

Tobacco

- 5.126 The purchases of tobacco can be determined in some cases from the supply source account via the allocation to purposes, based on the retail trade sample survey. Since, however, a highly reliable data source is available in the form of the tobacco tax statistics (EVAS 79911), the supply source results for tobacco are replaced by the results of the special assessment for tobacco. The special assessment consists of the taxed purchases of tobacco according to the tobacco tax statistics and of tobacco smuggling. In this connection, the figures in the tobacco tax statistics are not to be regarded as adjustments for exhaustiveness; in contrast, the figures for tobacco smuggling should be regarded as such. The special assessment for tobacco is explained in more detail below.

Narcotics

- 5.127 Purchases of narcotics are an illegal activity and are explained in detail in Chapter 7. This item is an allowance for exhaustiveness.

Other special assessment goods

- 5.128 The retail trade also includes purchases of fuel wood, coal, motor vehicles and liquid gas. The calculations are explained below under the special assessments.

5.7.13 Supply source 9 Transport

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	47.598
Amount after reconciliation.....	47.419

WZ 2008, Consumption expenditure in 2010	EUR bn
49 Land transport.....	27.565
50 Water transport.....	1.013
51 Air transport.....	14.188
52 Other transport services.....	2.105
53 Postal and courier services.....	2.727
Total (assessed amount).....	47.598

- 5.129 The underlying data for the calculation of **turnover** in the national accounts is provided by the service structure survey (EVAS 47215). This turnover is supplemented by VAT and **adjustments for exhaustiveness**. The adjustments for exhaustiveness concern adjustments for small businesses, the hidden economy, benefits in kind and tips. The adjustment for small businesses is necessary because the business register and thus the service structure survey do not include enterprises with an annual turnover of less than EUR 17 500. The source for the allowance consists of the statistics on VAT assessments (EVAS 73312), which display data on the turnover of small businesses. Estimated figures are added for tips for taxis and removal services, since they are typically found only in these areas. The adjustments for the hidden economy are based on a hidden economy model which is explained in detail in Chapter 7.1.
- 5.130 **Benefits in kind** occur primarily in rail and air travel. A model calculation is performed for both areas. The calculation is based on the consumption expenditure on rail and air travel per household as stated in the national accounts. It is assumed that the households of persons employed by the railways or by an airline, including retired persons, will on average use rail or air travel for their journeys more often than the average for all households.
- 5.131 The **consumption ratios** are estimated for each five-digit WZ subclass and checked in the context of the input-output account.

5.7.14 Supply source 10 Hotels and restaurants

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	63.284
Amount after reconciliation.....	63.045

WZ 2008, Consumption expenditure in 2010	EUR bn
55 Hotels	16.713
55 Hotels	46.571
Total (assessed amount).....	63.284

- 5.132 As described above in 'Supply sources 6-8 Trade, 10 Hotels and restaurants', the underlying data for determining **turnover** in the area of hotels and restaurants is provided by the business register. VAT is added, supplemented by **adjustments for exhaustiveness**. The **adjustments** for exhaustiveness include **adjustments** for small businesses and the hidden economy, as described above. In addition, there are tips and **adjustments** for stays in private accommodation, for works canteens and for benefits in kind in works canteens.
- 5.133 **Tips** are paid on a relatively large scale in hotels and restaurants; in percentage terms, more is paid in the area of food services than in the area of accommodation. Percentages are estimated for tips in relation to turnover, including VAT, broken down into five-digit WZ subclasses. On average, an allowance of 3% of gross turnover is applied for tips.
- 5.134 The allowance for stays in **private accommodation** arises from the fact that there are many private landlords who let out property on a small scale and who are not liable for VAT because they fall below the VAT return threshold of EUR 17 500 per year. Their turnover does also not appear in the business register. An allowance is therefore necessary and is determined using a model calculation. The underlying data is provided by information from the German Economic Research Institute for Tourism at

the University of Munich on numbers and prices in relation to private landlords with fewer than nine beds.

- 5.135 **Works canteens** are legally dependent parts of enterprises involved in other economic activities, e.g. manufacturing. Consequently, they do not form part of the turnover in the area of hotels and restaurants and are therefore added. They are estimated as a percentage of the turnover of WZ 56.29.0 Other food service activities, which also includes legally independent canteens. In recent decades, works canteens have been increasingly transformed into legally independent canteens. Works canteens are now only found relatively rarely. The proportion of the turnover of WZ 56.29.0 generated by works canteens is therefore decreasing from year to year and is now insignificant. Moreover, 3% of the turnover of WZ 56.29.0 Other food service activities is assumed to be benefits in kind provided by canteens.
- 5.136 The **consumption ratios** are determined with the aid of the annual survey of the hotels and restaurants sector (EVAS 45342). The survey provides data on turnover, categorised according to the purposes of accommodation, restaurant services, canteen and catering services, trade, other services, manufacturing and processing. Based on this data, purpose-specific consumption ratios are determined for each five-digit WZ subclass.
- 5.137 **Prostitution** services are determined in a special assessment 'Prostitution' in accordance with the production approach (see section 3.25). Prostitution services are legal in Germany and some elements of prostitution are already reported, for instance under hotels and restaurants. Since, however, all prostitution services are calculated using the prostitution model (supply source 15 Other services), corresponding services are removed from hotels and restaurants in order to avoid double counting.

	2010 EUR bn
Hotel and restaurant turnover, business register	66.792
+ VAT	9.815
+ Adjustments for small businesses, works canteens, hidden economy, benefits in kind	2.770
+ Adjustment for stays in private accommodation	1.775
+ Adjustment for tips	2.278
= National accounts total gross turnover, supply source Hotels and restaurants	83.430
- Company purchases, prostitution	20.145
= Household final consumption expenditure, supply source Hotels and restaurants ..	63.284

5.7.15 Supply source 11 Information and communication

Household final consumption expenditure in 2010	EUR bn
Assessed amount	53.463
Amount after reconciliation	53.260

- 5.138 Supply source 11 Information and Communication covers economic activities 58 to 63. These include publishing activities, film and music services, cinema, radio and television broadcasting activities, telecommunications and information services. Typical consumer goods and services include newspapers and magazines, cinema visits, payments to broadcasters, cable connection fees, charges for pay-TV, telecommunications and Internet services.

WZ 2008, Consumption expenditure in 2010	EUR bn
58 Publishing.....	8.448
59 Motion picture, video and television programme production; cinemas etc.	1.577
60 Programming and broadcasting activities	11.060
61-63 Telecommunications, information technologies, services.....	32.378
Total (assessed amount).....	53.463

WZ 58 Publishing, WZ 62-63 Information technologies, services

- 5.139 For the calculations in this area, the five-digit WZ subclasses that are relevant to consumption expenditure are first selected. The underlying data for calculating turnover excluding VAT is provided by the service structure survey (EVAS 47215). Gross turnover is calculated using the average VAT rates taken from the VAT statistics (EVAS 53111). An adjustment for exhaustiveness for the hidden economy is then added. This is based on a hidden economy model which is explained in more detail in section 7.1. The consumption ratios are estimated for each five-digit WZ subclass and checked in the context of the input-output account.

WZ 60 Programming and broadcasting activities

- 5.140 The household final consumption expenditure on broadcasting is composed of three different items:
- radio and television licence for public broadcasting
 - payments for cable TV
 - pay-TV for private television channels

Expenditure on radio and television licences for public broadcasting is determined from the data published by the Radio and Television Licences Agency in their annual reports on the number of television and radio broadcast receivers and on the monthly licences per receiver. These reports also contain data on household receivers. With effect from 2013, the type of licence fee has changed (it is no longer based on the number of receivers, but on the household). The 'Licence fee collection service of ARD, ZDF and Deutschlandradio' has assumed responsibility for collecting the licence fees; it no longer publishes any data. The values from 2013 onwards are therefore extrapolated using the number of households and the appropriate consumer price index. The payments for cable TV are taken from the annual reports of the Federal Network Agency. The expenditure on pay-TV is derived from the publication 'German Entertainment and Media Outlook 2006-2010' by PricewaterhouseCoopers. Since this data is only available up to 2010, an extrapolation is carried out based on the growth in turnover of private sector suppliers of pay-TV.

WZ 61 Telecommunications

- 5.141 The underlying data for calculating turnover excluding VAT is provided by the service structure survey (EVAS 47215). Gross turnover is calculated using the average VAT rates taken from the VAT statistics (EVAS 53111). Turnover from the hidden economy is then added. This adjustment is based on a hidden economy model which is explained in detail in Chapter 7.1. The consumption ratios are estimated for each five-digit WZ subclass and checked in the context of the input-output account.

5.7.16 Supply source 12 Financial and insurance activities

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	87.489
Amount after reconciliation.....	87.489

5.142 The household final consumption expenditure in supply source 12 Financial and insurance activities is broken down as follows:

WZ 2008, Consumption expenditure in 2010	EUR bn
64 Financial services	
Service charges actually paid.....	13.513
FISIM.....	26.616
65 Insurance activities.....	43.115
66 Other activities auxiliary to financial and insurance activities.....	4.245
Total (assessed amount).....	87.489

5.143 Well over 6% of household final consumption expenditure is devoted to financial and insurance activities. The value of the actual bank charges paid, the insurance companies' service charges and the services used by households in activities auxiliary to financial services and insurance activities is calculated by a combination of the respective service charge and the corresponding consumption ratios. Data on household consumption of financial intermediation services (FISIM), however, is derived directly from the calculation of FISIM. For this purpose, the deposit and loan stocks and the corresponding interest rates are used, initially broken down by user sector, so that households are directly identifiable as a separate user sector (see excursus FISIM, section 3.17.1).

WZ 64 Financial services

a) Service charges actually paid

In this area of economic activity it is a matter of determining the actual bank charges paid by households for consumption purposes. The starting point consists of the ancillary sales of credit institutions without income from housing services, which totalled EUR 45.043 bn in 2010. An estimated 30 % of this is attributable to household final consumption expenditure. The institutions' profit and loss accounts provide the basis for the valuation of the service-charge element of this expenditure (see section 3.17.1).

b) Financial intermediation services indirectly measured (FISIM)

FISIM result from the difference between the actual interest and the interest calculated at the reference rate (see section 3.17.1 excursus FISIM). When FISIM is allocated to the aggregates of the expenditure approach, EUR 26.616 bn is attributable to household final consumption expenditure in Germany.

WZ 65 Insurance activities

5.144 Private consumption expenditure on insurance does not comprise the payment of gross premiums but only the service charge, i.e. the insurance companies' administration expenses plus profit. This takes into account the fact that the major portion of the gross premiums paid by the policyholders flows back to them in various forms, representing in other words a redistribution of the money within the Households sector, which is not considered within the scope of the national accounts. The service charge from premiums is calculated by summing up gross premiums written and premium supplements and deducting flows to the policyholders, whether paid or in the form of a change in the technical reserves. The calculation is based on

aggregated profit and loss accounts of the Federal Financial Supervisory Authority (BaFin) (see section 3.17).

While the services of life insurance, pension contributions and private health insurance⁷³ fully benefit the households, only a certain part of the service charge of indemnity insurance companies is attributable to purchases by households. The value of this part is assessed by applying the consumption ratio, which is calculated separately for each individual segment of the insurance market. The calculation of these ratios is based on data from the Federal Financial Supervisory Authority. Reinsurance services are not listed here, because they are not used by households, but by insurance companies.

An annual revision of consumption ratios is carried out, especially in quantitatively significant branches, e.g. motor vehicle liability insurance. The information on this is obtained from the registration statistics of the Federal Motor Transport Authority .

WZ 66 Activities auxiliary to financial services and insurance activities

- 5.145 Using a consumption ratio, the household final consumption expenditure within the output of WZ 66 “Activities auxiliary to financial services and insurance activities” is calculated to be EUR 4.245 bn.

5.7.17 Supply source 13 Housing services

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	265.442
Amount after reconciliation	265.442

- 5.146 The calculation of housing services is carried out firstly for actual rent paid, and secondly for imputed rents for owner-occupied dwellings. Housing services are valued using the stratification method in accordance with Regulation (EC) No 1722/2005. Stratified volume figures for rented and owner-occupied dwellings are valued on the basis of the 2011 population and housing census, with suitable prices per square meter. The calculation is described in detail in section 3.18.2. This relates initially to rent excluding service charges, which are calculated separately and subsequently added. In addition, the second home tax is added to the rent actually paid. The amount can be taken from the fiscal statistics (EVAS 71211).

Consumption expenditure in 2010	EUR bn
Rents actually paid (incl. second home tax)	105.364
Imputed rents for owner-occupied dwellings.....	130.514
Service charges.....	29.564
Total (assessed amount).....	265.442

- 5.147 The service charges (excluding energy, for energy see supply source 2) include the cost of water and sanitation, chimney sweeping, refuse collection, cable connections, lifts, the services of a concierge and care of common gardens etc. They are calculated separately and in the same breakdown as the rents. Since information on service charges is collected exclusively on the basis of household surveys and only from tenant households, the service charges for households of owner-occupiers are

⁷³ Statutory health insurance is part of social insurance, so that these services do not form part of supply source 12.

estimated on the basis of comparable rental properties using the stratification method (see section 3.18.).

- 5.148 Information on service charges (excluding energy) is available for 2002, 2006 and 2010 from the microcensus additional surveys on the housing situation of households (EVAS 12212). In addition, data from the annual statistics of the Bundesverband deutscher Wohnungs- und Immobilienunternehmen e.V. (Federation of German Housing Enterprises, GdW) is used to check the plausibility of the results of household surveys and, if necessary, to correct them. The interpolation of intermediate years and extrapolation to the current situation is based on the price performance of the respective items in the consumer price index.
- 5.149 The service charges derived from household surveys are adjusted for the components, which are collected as additional property expenses but which in accordance with the concepts of ESA are not attributable to consumption expenditure in the area of housing services. The correction is made for the proportion of real estate tax B attributable to residential property and for the insurance premiums paid for residential buildings insurance.

	2010, EUR bn
Service charges.....	41.007
– Real estate tax B	6.824
– Residential buildings insurance premiums	4.619
= Service charges in supply source 13	29.564

Activities of real estate agencies relating to buildings, dwellings and land are not recorded in supply source 13 Housing services but in supply source 15 Other services.

5.7.18 Supply source 14 Human health and social work activities

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	59.364
Amount after reconciliation	59.137

WZ 2008, Consumption expenditure in 2010	EUR bn
86 Human health activities	41.977
including: Hospitals.....	13.305
Medical and dental practices	22.919
87,88 Social work, care homes	17.387
Total (assessed amount).....	59.364

- 5.150 Services in the field of human health and social work activities (WZ 86-88) may be provided by general government or private sector units. The calculations in supply source 14 relate exclusively to units in sectors S.11 Non-financial corporations and S.14 Households. Services provided by general government units are included in supply source 16 and those by NPISHs in supply source 17. Services paid for by the statutory health insurance system are not household final consumption expenditure, but general government consumption expenditure.
- 5.151 The starting point for the calculations in the area of human health and social work activities consists of the output values, including the adjustments for exhaustiveness, of the national accounts production approach. This is explained in more detail in

Chapter 3. The output is supplemented by the VAT taken from the VAT statistics (EVAS 53111), which produces the national accounts gross turnover. All data is available in five-digit WZ subclasses, so the calculations also take place at this level of detail.

- 5.152 In the area of human health and social work activities, it is assumed that almost all services that are not covered by the statutory health or care insurance systems are household final consumption expenditure. A small proportion of the output is not accepted as a service for households, e.g. lectures, seminars and conferences of physicians and other healthcare providers. The services that are not relevant to consumption, the benefits in kind of the statutory health or care insurance systems and special social assistance benefits are therefore deducted from the national accounts gross turnover. These benefits in kind and social benefits are derived from the accounting results of the Federal Government, the federal states and the social security fund (EVAS 71712). The calculations are performed at five-digit WZ subclass level.

5.7.19 Supply source 15 Other services

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	97.700
Amount after reconciliation	97.328

- 5.153 Supply source 15 Other services is very extensive and heterogeneous in nature. It covers household final consumption expenditure in economic activities WZ 68-WZ 97. The range of services includes repairs, leisure, culture and entertainment, gambling, personal care, educational programmes, domestic and gardening services, prostitution etc. These services can be offered by private sector or general government units. The calculations in supply source 15 relate exclusively to units of sectors S.11 and S.14. Purchases from general government units are included in supply source 16 General government, while those from NPISHs are recorded in supply source 17.

WZ 2008, Consumption expenditure in 2010	EUR bn
68-82 Administrative and support service activities.....	23.948
85 Education.....	7.712
90-93 Arts, entertainment and recreation	20.608
95-96 Other service activities.....	21.794
97 Household services	6.567
Special assessment for prostitution	14.135
Other special assessments, housing agency services	2.936
Total (assessed amount).....	97.700

WZ 68-82 Administrative and support service activities

- 5.154 The starting point for the calculations consists of the output values of the national accounts production approach for consumption-related areas of activity. This is explained in more detail in Chapter 3. The national accounts output is supplemented by the VAT derived from the VAT statistics (EVAS 53111) and by an allowance for exhaustiveness for the hidden economy. The allowance is based on a hidden economy model which is explained in detail in Chapter 7. These calculations produce the national accounts gross turnover. All data is available in five-digit WZ subclasses, so the calculations also take place at this level of detail. The consumption ratios are estimated for each five-digit WZ subclass and checked in the context of the input-output account. Special assessments are carried out for car hire firms (WZ 77.11.0), travel agencies (WZ 79.10.0) and tour operators (WZ 79110).

WZ 77.11 Renting and leasing of cars and light motor vehicles not exceeding 3.5 tonnes

- 5.155 The turnover of car hire firms derived from households is based on publications by the German Car Hire Federation, which were available up to 2010. VAT is added, using the figures in the VAT statistics. From 2010 onwards, an extrapolation is carried out, based on the national accounts output of the car hire firms.

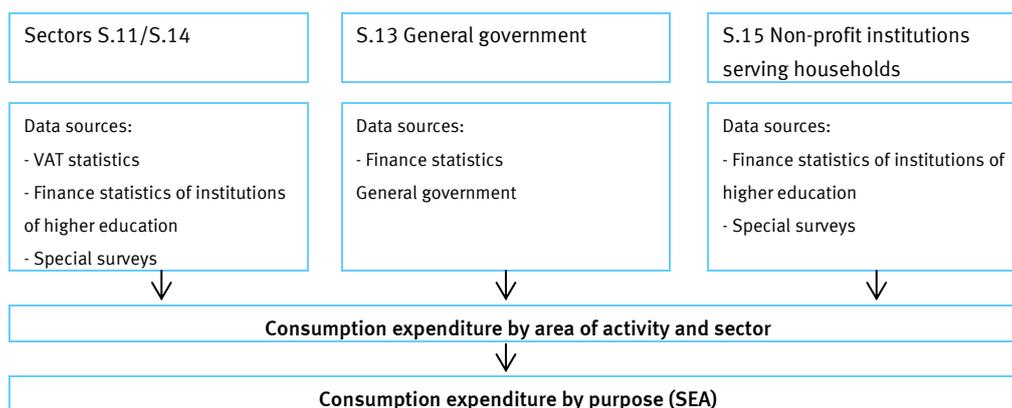
WZ 79.11.0 Travel agencies and WZ 79.12.0 Tour operators

- 5.156 The value of services supplied to households by travel agencies and tour operators is not assessed by calculating gross turnover but by calculating the intermediation services themselves, in order to avoid double counting, e.g. with the supply sources Transport and Hotels and restaurants. The services arranged by travel agencies and tour operators in the areas of Hotels and restaurants, Transport and Other services in Germany are reported in the respective supply sources. Services purchased from foreign enterprises are recorded by the balance of payments statistics. The turnover of travel agencies with private clients is published by the German Travel Association and is used as the basis for calculating consumption expenditure. The intermediation margin is determined and VAT is added.

The starting point for the calculations of consumption expenditure with tour operators is the national accounts output, which is based on the service statistics (see section 3.20). The intermediation services are calculated with the aid of information from the German Travel Association on the intermediation margin. VAT is added on the basis of the VAT statistics.

WZ 85 Education

- 5.157 A special assessment is performed for education, in order fully to record macroeconomic consumption expenditure in this area, classified by sector. Firstly, consumption expenditure is determined separately for each sector, based on the demarcation used in the classification of economic activities. It is then attributed to the individual SEA items.

Figure 5—3: Determination of consumption expenditure by area of activity and sector**a) S.13 General government**

General government educational services are mainly provided to the population free of charge. In most cases, household final consumption expenditure is limited to examination, registration and participation fees and to supplementary payments. In the national accounts, these fees and supplementary payments are recorded as general government sales to households. General government income and expenditure is recorded by the financial statistics relating to public budgets (supply source 16 General government). General government sales to households in the area of education are identified by means of a special assessment. Detailed information makes it possible to show general government sales to households categorised by five-digit WZ subclass and by purpose.

b) Sectors S.11/14/15 – Kindergartens

No annual surveys are conducted for private childcare facilities. For reporting year 2010, information is available on parental contributions for attendance at preschool, thanks to a Paragraph 7-survey on the income and expenditure of private childcare facilities. In conjunction with the child numbers from the child and youth welfare statistics, parental contributions per child were calculated for 2010. For the extrapolation forwards and backwards of average per capita expenditure, the appropriate consumer price index is used. Finally, the parental contributions per child were extrapolated at current prices using the corresponding child numbers from the child and youth welfare statistics (EVAS 22551).

c) Sectors S.11/14/15 – Schools

For non-state schools, household final consumption expenditure is limited to school fees. No annual survey is conducted on the finances of independent schools. For reporting years 1995 and 2009, Paragraph 7-surveys⁷⁴ were carried out on income and expenditure (EVAS 21931). Based on the surveys and the number of pupils in private schools reported in the school statistics (EVAS 21111), expenditure per pupil was calculated, subdivided into five educational levels. For the extrapolation forwards and backwards of average per capita expenditure, the appropriate consumer price index is used. Finally, annual household final consumption expenditure on independent schools was extrapolated, based on the expenditure per pupil and the corresponding pupil numbers.

⁷⁴ Section 7 of the Federal Statistics Act, surveys for special purposes to meet a short-term data requirement

d) Sectors S.11/14/15 – Higher education

Typical household final consumption expenditure on universities includes tuition and examination fees. The finance statistics of institutions of higher education (EVAS 21371) are based on annual surveys of all universities in Germany with regard to their income and expenditure, including the contributions by students. For the accounting of consumption, an annual special assessment for the contributions of students is carried out for sectors S.11, S.14 and S.15. The results of the evaluation are integrated directly in the consumption account.

e) Sectors S.11/14 – Further education, driving schools, sport, leisure and cultural education

Training courses offered by commercial providers are generally subject to VAT. The VAT statistics (pre-notification EVAS 73311 and assessment EVAS 73312) and the business register (EVAS 52111) record this turnover and thus form the data basis for determining household final consumption expenditure in this area. The combination of these three data sources, including VAT, is used to calculate the national accounts gross turnover for WZ 85.51.0, 85.52.0, 85.53.0, 85.59.1, 85.59.2, 85.59.9 and 85.60.0. Some training courses are not subject to VAT. The turnover data is therefore supplemented by an adjustment for exhaustiveness and the hidden economy. Finally, household final consumption expenditure is determined using consumption ratios and is reviewed in the context of the input-output account.

WZ 90-93 Arts, entertainment and recreation

- 5.158 The starting point for the calculations consists of the output values of the national accounts production approach for consumption-related areas of activity. This is explained in more detail in Chapter 3. The output is supplemented by the VAT derived from the VAT statistics (EVAS 53111) and the adjustment for exhaustiveness for the hidden economy. The adjustment is based on a hidden economy model which is explained in detail in Chapter 7. Estimated tips are added for casinos and gambling clubs. These calculations produce the national accounts gross turnover. All data is available in five-digit WZ subclasses, so the calculations also take place at this level of detail. The consumption ratios are estimated for each five-digit WZ subclass and checked in the context of the input-output account.

WZ 95-96 Other service activities

- 5.159 The starting point for the calculations consists of the output values of the national accounts production approach for consumption-related areas of activity. This is explained in more detail in Chapter 3. The output is supplemented by the VAT derived from the VAT statistics (EVAS 53111) and the adjustment for exhaustiveness for the hidden economy. The adjustment is based on a hidden economy model which is explained in detail in Chapter 7. Moreover, estimated tips are also added for hairdressing and beauty salons (WZ 96.02.1, 96.02.2). These calculations produce the national accounts gross turnover. All data is available in five-digit WZ subclasses, so the calculations also take place at this level of detail. The consumption ratios are estimated for each five-digit WZ subclass and checked in the context of the input-output account.

WZ 97 Household services

- 5.160 Household services are included in consumption expenditure if they are provided in exchange for payment. It has been agreed that unpaid services within households should not be taken into account. The amount to be estimated for the calculation of household final consumption expenditure is therefore the amount of remuneration

given to paid employees in households. The full value of these household services is assigned to household final consumption expenditure.

The calculation of employee remuneration for household services is performed by means of a quantity-price method. For this, the number of employees in private households is multiplied by the relevant average pay level. Part-time workers earning less than the minimum for inclusion in the statutory social-security scheme are also included. Details of the calculation are contained in section 3.26. The most important data sources are the employment statistics, the microcensus and pay scale information for employees in households. The statutory income limits for marginal part-time employment are also taken into account.

Special assessment for prostitution

- 5.161 The special assessment for prostitution is explained in detail in section 3.25 and is integrated in the calculation of consumption expenditure in supply source 15 Other services.

5.7.20 Supply source 16 General government

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	12.130
Amount after reconciliation	12.130

- 5.162 Household final consumption expenditure for supply source 16 General government covers sales to households by units of the general government sector (S.13). These include, for example, entrance fees to public museums and swimming pools, parking charges, re-registration and examination fees at public universities, driving licence fees and passport fees. The units of general government are allocated to various economic activities.

WZ 2008, Consumption expenditure in 2010	EUR bn
84 Public administration	4.411
85 Education.....	3.979
90 Creative, arts and entertainment activities	0.871
Other.....	2.869
Total (assessed amount).....	12.130

- 5.163 The starting point for the calculation of consumption expenditure is the highly detailed data in the annual accounting figures contained in the budgets of the Federal Government, the federal states and the municipalities (EVAS 71711). In these public budgets, all items of revenue and expenditure are classified in accordance with a uniform system for the Federal Government and the federal states or for municipalities and special-purpose associations, and by economic categories (the grouped budget) and functional criteria, i.e. areas of responsibility (the functional budget or classification/product budget). These classifications are the basis for the valuation of sales effected by the Federal Government, the federal states and the municipalities.
- 5.164 Firstly, the proportions of general government sales to sector S.14 are identified. To this end, all the sales of general government are evaluated at the level of the individual function numbers or classification/product numbers to determine their respective proportion. In addition to sales to households, this also includes sales to self-employed entrepreneurs. The second step, therefore, is to determine the proportion of households in the total sales made to S.14. Finally, the sales by general government to households are classified according to economic activity. Underlying data for this

division is also provided by the evaluation of sales by general government function. In this case, an economic activity is allocated to each function number or classification/product number.

5.7.21 Supply source 17 Non-profit institutions serving households

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	6.900
Amount after reconciliation.....	6.900

- 5.165 NPISHs are private non-market producers with legal personality. Examples include churches and religious communities, trade unions, associations or clubs. The goods and services offered by NPISHs are sold or provided free of charge. The goods and services provided free of charge are included in the consumption expenditure of NPISHs. The goods and services purchased by households are recorded in household final consumption expenditure and break down as follows:

WZ 2008, Consumption expenditure in 2010	EUR bn
85 Education.....	2.300
88 Social work	1.418
95 Sport and recreation	1.598
Other.....	1.583
Total (assessed amount).....	6.900

- 5.166 The starting point for the assessment of sales to households is the output from the national accounts production approach, which is calculated on the expenses side; this calculation is explained in detail in section 5.8. Own-account fixed capital formation, sales to the social security fund, to regional and local authorities and to enterprises are also calculated in the production approach and deducted from the output. The remainder is the sum of sales to households and the free provision of goods and services to households (=consumption expenditure of NPISHs). This is allocated to the two items on the basis of an estimated ratio, but this allocation does not affect the total level of consumption expenditure. Figure 5-4 shows the interrelationships.
- 5.167 The calculation for NPISHs is broken down according to nine two-digit WZ divisions. The values are supplemented by VAT and adjustments for the hidden economy. However, the calculation described in supply source 15 Other services is carried out for WZ 85 Education, based on the various educational statistics, and replaces the calculation just described above for WZ 85.

Figure 5—4: Determination of sales to households and final consumption expenditure of non-profit institutions serving households

Intermediate consumption		Own-account fixed capital formation	Output
		Sales to the social security fund	
Consumption of fixed capital	Gross value added	Sales to regional and local authorities	
Other taxes on production, less other subsidies		Sales to enterprises	
Compensation of employees		Sales to households	
		Final consumption expenditure of non-profit institutions serving households	

5.7.22 Supply source 20 Travel income and expenditure

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	34.112
Amount after reconciliation	34.112

- 5.168 The total household final consumption expenditure by supply sources, including the special accounts, reflects the purchases made in Germany by resident households. ESA 2010, however, requires the calculation of all consumption expenditure, both at home and abroad, by resident households. For this purpose, we have to incorporate consumption expenditure in the rest of the world by residents of Germany and to eliminate consumption expenditure in Germany by residents of other countries.

	Year 2010, EUR bn
Consumption expenditure by residents of Germany in the rest of the world	59.498
– Consumption expenditure in Germany by residents of other countries	25.386
= Balance of travel expenditure	34.112

- 5.169 Both the final consumption expenditure by residents of Germany in the rest of the world and the expenditure of foreign-based households in Germany are recorded as part of the balance of payments by the Deutsche Bundesbank (EVAS 83111). The Bank's calculation takes account of expenditure on holiday travel and accommodation, private expenditure on passenger transport and consumption expenditure by employees of extraterritorial establishments, such as embassies, consulates and military bases.
- 5.170 Household consumption expenditure by employees of extraterritorial establishments comprises four separate accounts: Household consumption by German employees of German diplomatic and consular missions, household consumption by non-German employees of foreign diplomatic and consular missions in Germany, household consumption by members of the Federal Armed Forces stationed abroad and household consumption expenditure by members of the allied forces in Germany are calculated separately in each case.
- 5.171 Household consumption by German employees of German diplomatic and consular missions is based on total personnel costs as entered in the Federal Budget for the missions of the Federal Republic of Germany. The remuneration of staff and temporary/part-time employees is only reported in part, because it is assumed that this also relates to the remuneration of local staff who are employed by the diplomatic missions. A consumption ratio of 70 % is applied to the remainder of the personnel costs to obtain the private purchases of embassy staff in the rest of the world.
- 5.172 No statistics or survey results are available for the calculation of household consumption by non-German employees of foreign diplomatic and consular missions in Germany, so it is assumed that their household final consumption expenditure is approximately 80 % of the amount assignable to their German counterparts in German missions abroad.
- 5.173 The starting point for the calculation of private consumption by members of the Bundeswehr abroad is data from the Federal Ministry of Defence on the salaries of military personnel stationed abroad. A consumption ratio of 70 % is assumed.

- 5.174 For the calculation of private consumption by members of the Allied armed forces in Germany, data from the US Census Bureau and the UK Ministry of Defence on military personnel stationed in Germany is used. An expert estimate of the consumption ratio in a base year is extrapolated to the present day with the consumer price index for previous years and multiplied by the number of military personnel stationed in Germany.

	Year 2010 EUR bn
Expenditure on holiday travel and accommodation	50.978
+ Expenditure on passenger travel	8.034
+ Consumption expenditure by German employees of extraterritorial establishments abroad.....	0.486
= Consumption expenditure by residents of Germany in the rest of the world	59.498
Receipts for holiday travel and accommodation	18.311
+ Receipts for passenger travel.....	6.663
+ Consumption expenditure in Germany by non-resident employees of extraterritorial establishments	0.412
= Consumption expenditure in Germany by residents of other countries	25.386

- 5.175 The percentage of expenditure assignable to business travellers is deducted from the figures for holiday travel and accommodation and for passenger transport in the balance of payments statistics (EVAS 83111). The balance of payments does not provide any information on foreign purchases according to purpose, with the exception of passenger transport. Travel expenditure and income are therefore not broken down according to purpose.
- 5.176 Travel income and expenditure do not affect the level of GDP or GNI, because a balancing entry in the same amount but with the opposite sign is posted in net exports of goods and services.

5.7.23 Special assessments

- 5.177 Special assessments are carried out for some goods, as good additional sources are available for them or supply source accounting does not cover them sufficiently. In general, these are quantity x price calculations. The results of the special assessments are then integrated into the supply source calculations. The special assessment for housing services is explained briefly under supply source 13 and in detail in connection with the production approach. The special assessments for electricity, district heating and gas are explained in more detail under supply source 2 Electricity, gas, steam and air conditioning supply.

5.7.24 Special assessment for motor vehicles

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	55.658
Amount after reconciliation	54.759

5.178 Household final consumption expenditure on motor vehicles is composed of:

	Year 2010, EUR bn
Purchases of new vehicles.....	27.422
+ Purchases of used vehicles	10.460
+ Private use by commercial keepers, demonstration vehicles, one-day registrations	20.312
- Leasing of motor vehicles (reallocation to investment in machinery and equipment).....	4.890
+ Leasing.....	1.567
+ Purchases of vans and motor caravans.....	0.787
= Total	55.658

- 5.179 The calculation of **purchases of new vehicles** by households is based on the volume data for passenger cars in the registration statistics of the Federal Motor Transport Authority . The registration statistics distinguishes between private and commercial keepers of vehicles. The number of newly registered passenger cars is multiplied by the average prices determined and published by Deutsche Automobil Treuhand (DAT). For staff purchases, i.e. newly registered vehicles which have been purchased by employees of car-manufacturing companies, the price is reduced by the applicable rate of discount. Details of the number of staff purchases and the rate of discount granted by the company are elicited directly from the vehicle manufacturers.
- 5.180 Purchases of **used cars** include the transactions between households (private vehicle keepers) and the registered keepers in the other sectors. Trade in used motor vehicles between households is only recorded if it involves intermediation services by the motor trade: in that case, the turnover arising from intermediation is reflected in supply source 6 Motor trade. The number of used cars purchased by households from other sectors is also provided by the Federal Motor Transport Authority (re-registrations). The number of vehicles is multiplied by the average prices determined and published by Deutsche Automobil Treuhand (DAT).
- 5.181 The **private use of company vehicles** is a further component of the special assessment for motor vehicles. Cars that are registered to enterprises and to self-employed persons are frequently used in a private capacity. The value of this private use is determined from the registration statistics of the Federal Motor Transport Authority and included in household final consumption expenditure. To this end, the proportion of private use for newly registered company vehicles is estimated for each economic activity and added to consumption expenditure. In the motor trade, **demonstration vehicles** are registered for a short period, and large-scale use is made of so-called **one-day registrations**, which are recorded by the Federal Motor Transport Authority as commercial registrations. A one-day registration is a method by which a vehicle that is to be sold is registered by a dealer for a single day in order to be able to sell the vehicle to end customers at a higher discount. The registration and deregistration takes place formally on paper without the vehicle being driven on the road. It is assumed that most of these demonstration vehicles and one-day registrations are purchased directly by households.
- 5.182 For purchases of passenger cars, the purchase price is frequently not paid in full on transfer of ownership, rather payment by instalments (**leasing**) is agreed. The standard

contractual arrangements in the car leasing business in Germany do not meet the criteria of financial leasing as defined in ESA 2010, because there is no complete transfer of risk, and instead may be described, without exception, as operating leasing; this has consequences for the demarcation of car purchases between household final consumption expenditure and capital formation. The values of cars sold are determined, in terms of both household final consumption expenditure and investment in machinery and equipment, by means of an analysis of the number of new vehicles recorded in the registration statistics of the Federal Motor Transport Authority . Since these statistics are compiled on the basis of registered keepers, all passenger cars that are privately purchased by means of operating leasing are assigned to the category 'Employees and persons not gainfully employed'. Under the owner-based approach, which is a primary requirement of ESA 2010, these purchases must, however, be reallocated to the lessors. The reallocations from households to enterprises made as part of the adaptation to the ESA ownership concept are based on the annual leasing survey by the Ifo Institute for Economic Research. Based on this information, the lease instalments of households are also calculated and added to household final consumption expenditure.

Further explanations of the special assessment for motor vehicles may also be found in section 5.10.2 Investment in machinery and equipment.

- 5.183 Households also purchase **vans and motor caravans**. Once again, the numbers are calculated using the registration statistics from the Federal Motor Transport Authority . The prices are the manufacturer's list prices, plus VAT, which are compiled in connection with the consumer price index.
- 5.184 For 2009 and 2010, this special assessment takes account of the fact that a general government **scrapping bonus** was paid to households when they scrapped an old motor vehicle and registered a new or one-year-old car. The bonus of EUR 2 500 per scrapping and new purchase was introduced as part of the second economic stimulus package. The scrapping bonus is recorded in the national accounts as a subsidy on products and not as household final consumption expenditure. Since the average prices used by Deutsche Automobil Treuhand include the scrapping bonus, this bonus is subtracted from the value of new registrations. The bonus was paid to households by the Federal Office of Economics and Export Control, which is also the data source for the amount of the payments.

5.7.25 Special assessment for automotive fuel

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	49.437
Amount after reconciliation	48.861

- 5.185 The underlying data used to determine household final consumption expenditure on automotive fuel is derived from the mileage account of the environmental-economic accounts (EVAS 85111) from the Federal Statistical Office. The starting point for the calculations consists of the motor vehicle stocks in Germany according to the Federal Motor Transport Authority , broken down by type of keeper (private/commercial), vehicle type and fuel type (diesel, gasoline, LPG, natural gas), plus the mileage and fuel consumption calculations of the German Institute for Economic Research. The

results are calculated in the environmental economic accounts and incorporated in the national accounts⁷⁵.

- 5.186 In connection with fuel purchases, it is also taken into account that company cars may be used in a private capacity with the employer paying for the fuel (and vice versa). Apart from road traffic, households also need fuel for other reasons, e.g. for private planes, boats and lawnmowers, are also know into account. These details are also incorporated in the environmental economic accounts or consumption account.
- 5.187 All the data in the environmental economic accounts consists of volume figures subdivided by fuel type. To determine consumption expenditure on fuel, these units of quantity are multiplied by the annual average prices of the various fuels in the consumer price index (EVAS 61111).

Household final consumption expenditure in 2010	EUR bn
Petrol	33.511
Diesel.....	15.265
LPG and natural gas	0.662
Fuel, total.....	49.437

5.7.26 Special assessment for tobacco

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	23.050
Amount after reconciliation	22.972

- 5.188 Consumption expenditure on tobacco includes cigarettes, cigars, cigarillos, fine-cut tobacco and pipe tobacco. The turnover reported in the tobacco tax statistics (EVAS79911), including VAT and tobacco tax, represents the full amount of household final consumption expenditure for legally purchased tobacco.

The value of cigarettes illegally sold in Germany is determined using an estimation model (see section 7.1.2).

Household final consumption expenditure in 2010	EUR bn
Cigarettes, including cigarette smuggling.....	19.729
Cigars.....	0.655
Tobacco	2.666
Tobacco, total	23.050

5.7.27 Special assessment for liquid fuels

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	10.131
Amount after reconciliation	10.096

- 5.189 The quantities of liquid fuels purchased by households are taken from the energy balances for the Federal Republic of Germany, which are compiled by the Working Group on Energy Balances. The average price per unit of quantity including VAT is derived from the calculation in the consumer price index.

⁷⁵ See Federal Statistical Office 2011 Environmental Economic Accounts, development of calculations for energy consumption and CO₂-emissions in road traffic within the NAMEA accounting approach

5.7.28 Special assessment for liquid gas

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	0.559
Amount after reconciliation.....	0.560

5.190 The quantities of liquid gas purchased by households are taken from the survey of the sale of liquid gas (EVAS No 43391). Sales of liquid gas to households are valued using the average annual price (EUR/kWh). Up to 2007, the average price is taken from the publication "Selected figures on the energy sector", but this has not been published since that year. Therefore, from 2008 onwards, the annual average price for liquid gas is extrapolated from the figure for 2007 using the development of the average price for gas taken from the annual of the generation and sale of gas (EVAS 43341). VAT is then added.

5.7.29 Special assessment for solid fossil fuels

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	0.828
Amount after reconciliation.....	0.838

5.191 The quantities of solid fossil fuels purchased by households are taken from the energy balances for the Federal Republic of Germany, which are compiled by the Working Group on Energy Balances. The average price per unit of quantity including VAT is derived from the calculation in the consumer price index.

Data on miners' coal allowances (benefits in kind) are provided by the statistics of the Coal Industry Association (Kohlenwirtschaft e.V.). This association is responsible for compiling the summary statistics required by the authorities in connection with the coal industry. The amounts are valued using the prices in the producer price index for industrial products (EVAS 61241).

5.7.30 Special assessment for fuel wood

Household final consumption expenditure in 2010	EUR bn
Assessed amount.....	1.280
Amount after reconciliation.....	1.280

5.192 The quantities of fuel wood, including pellets, purchased by households are taken from the energy balances for the Federal Republic of Germany, which are compiled by the Working Group on Energy Balances. Fuel wood is sold by retailers or forestry enterprises. Because of the quite substantial price differential, separate calculations are performed for each of these two types of sales outlet. In the retail trade, the average selling price in the consumer price statistics is used. The value of the volume sold by forestry enterprises is assessed on the basis of market reports compiled by the forestry authorities.

5.8 Final consumption expenditure of non-profit institutions serving households

Calculation of NPISHs (sector S.15)

- 5.193 This section describes the non-profit institutions which serve households as non-market producers and are therefore allocated to the NPISH sector (S.15) (ESA 2010, paragraph 3.31 et seq.).

Since the calculation bases and methods are very similar for the various NPISHs, regardless of their area of economic activity, they are first described below in summary. The whole NPISH sector (S.15) is represented in the following industry divisions of WZ 2008:

WZ no	Industry
72	Research and development
85	Education
86	Human health activities
87	Residential care activities
88	Social work activities
90	Creative, arts and entertainment activities
91	Libraries, archives, museums and other cultural activities
93	Sport, entertainment and recreation
94	Membership organisations, religious organisations

- 5.194 Insofar as other activities cannot be identified statistically, they remain with the main activity of the statistical unit in question. In addition, it should be noted that the housing services of non-profit institutions are reported systematically as market output in WZ 68 “Real estate activities” and are not included in sector S.15.

Calculation of the results:

- 5.195 For non-profit institutions, the gross value added and output are calculated by the summation of expenditure – as is standard with non-market producers – because the services are predominantly provided free of charge.
- 5.196 The statistical data available for determining the gross value added of NPISHs in Germany was significantly improved during the revision of the national accounts in 2011. An important and central project for almost all aggregates in the calculation of the gross value added of NPISHs was the Community project “Civil Society in Figures”⁷⁶ financed by an external consortium. The aim of this project was to determine the economic importance of the “third sector”⁷⁷ in Germany. The underlying data base for the project consisted of a copy of the 2007 statistical business register at federal level with data on the number of units and of employees subject to social insurance contributions and in marginal employment. As part of the two-year project, the units in the business register were allocated, among other things, to sectors based on the

⁷⁶ The project report “Abschlussbericht Modul 1” (June 2011) and further information on the topic of “Civil Society in Figures” may be found at: <http://www.ziviz.info/publikationen/publikationen-und-materialien/>

⁷⁷ The term “third sector” is used here to describe the area between the market and general government.

The following expenditure items are determined in each case in the above subdivision by industry sector.

- 5.201 The **compensation of employees** of NPISHs is determined during the income calculation and represents the largest expenditure item in terms of value. It is made up of the following components:

Year 2010	EUR (billions)
Gross wages and salaries	34.782
+ Employers' social security contributions	7.917
= Compensation of employees	42.699

- 5.202 The **gross wages and salaries** of NPISHs consist of the gross wages and salaries of general employees, salaried employees, civil servants and part-time employees in marginal employment. As part of the 2014 revision, disabled people in recognised workshops have also been allocated to the category of employees, so that gross wages and salaries are now calculated for these persons. In Germany, workshops for disabled people are part of sector S.15 and are classified as industry division 88 (social work, not including care homes) within this sector.

In essence, gross wages and salaries are determined for each employee group – subdivided into the nine aforementioned industry divisions of WZ 2008 – by multiplying the number of employees in the relevant employee group by the appropriate remuneration (gross wages and salaries per employee) for the relevant employee group and industry sector.

- 5.203 The gross wages and salaries of **general and salaried employees** (excluding marginal employees) constitute more than 90 % of the gross wages and salaries of non-profit institutions. The number of this persons in this group is essentially based, as stated above, on analyses in the business register (number of employees liable to social security contributions). The benchmark values for average gross wages and salaries were determined by industry in the course of the 2011 revision of the national accounts, based on a special processing of the labour cost survey (AKE) in 2008⁷⁸ and on the previous national accounts results⁷⁹, converted to WZ 2008 with the aid of the employment statistics. The gross wages and salaries per employee entered in the accounts were also checked for plausibility against the average earnings of employees in the same industry sector, in this case in the integrated sectors S.11, S.12 and S.14.⁸⁰

- 5.204 The **civil servants** in the NPISH sector are essentially members of the clergy of the Protestant and Catholic Churches, who in Germany have a status similar to that of civil servants and whose compensation is linked to that of general government civil servants. Since there are separate statistics on the number of individuals in this occupational group, but no reliable figures on the average gross wages and salaries, a model calculation was performed as part of the revision of the national accounts in

⁷⁸ As part of the special processing of the labour cost survey in 2008, average gross wages and salaries were also provided specifically for NPISHs for national accounting purposes.

⁷⁹ One of the main reasons for the comprehensive revision of the national accounts in 2011 was the introduction of WZ 2008.

⁸⁰ Checks were carried out, for example, to determine whether the average gross wages and salaries reported for employees of NPISHs in the area of human health activities (WZ 86) were plausible, compared to average wages in the same industry but in sectors S.11/S.12/S.14.

2011 that was based mainly on the provisions of the Remuneration of the Clergy Act and the Federal Salary Scale Act.

- 5.205 As explained elsewhere, the number of **persons in marginal employment** and their breakdown by sector were also taken from the business register. Special assessments are, however, necessary for other subgroups of marginal employment. For a sectoral breakdown of employees in the additional expenditure variant of Germany's 'one-euro jobs' part-time work programme, a special survey by the Association of German Cities from 2002 was used. This structural data was checked for plausibility against figures from the Federal Employment Agency on areas of deployment for persons in the 'one-euro jobs' programme (special assessment for 2008 and 2009). The benchmark values for gross wages and salaries per employee were taken from the labour cost survey of 2008, which as part of a special processing for national accounts purposes recorded for the first time the average gross wages and salaries of persons in marginal employment in NPISHs.
- 5.206 The average gross wages and salaries of general employees, salaried employees, civil servants and part-time employees in marginal employment at NPISHs are extrapolated with the same indicators that are used for the corresponding employee groups and industries in other sectors. Explanations of the extrapolation method may be found in section 4.7.1. of this GNI Inventory.
- 5.207 The calculation of the average gross wages and salaries of **disabled people in recognised workshops** is based on figures from the Federal Ministry of Labour and Social Affairs on the monthly compensation of employees in recognised workshops. This data is collected annually and published with a time lag of approximately two years. The monthly remuneration is reduced by the flat-rate employment promotion allowance that is paid unconditionally, irrespective of the work carried out. The employment promotion allowance is not a component of salary, but has the character of a social benefit and is reported in the general government accounts.

The number of disabled people in recognised workshops is taken from the employment statistics. In addition to disabled people, the number of employees also includes to a lesser extent persons in institutions run by youth welfare services and those taking part in the "Participation in working life" scheme. These two groups are allocated to the group of people with disabilities in recognised workshops, because there is no information on any other plausible allocation to an employee group and because the framework conditions of the work carried out by these groups of people most closely resemble those of disabled people in recognised workshops.

- 5.208 The calculation of **social contributions by employers** in the NPISH sector essentially corresponds to the general procedure described in section 4.7.2. To estimate the imputed social contributions of civil servants or members of the clergy in sector S.15, the ratio of imputed social contributions to gross wages and salaries of general government civil servants is applied to the gross wages and salaries of civil servants in non-profit institutions.

There are special rules for employers' social contributions for disabled people in recognised workshops. These persons are covered by statutory health insurance, social care insurance, statutory pension insurance, accident insurance and, in some cases, statutory unemployment insurance. The social contributions are paid by general government (social welfare institutions, the Federal Employment Agency) or reimbursed to the workshop in question by general government. The social contributions for disabled people in recognised workshops will therefore continue to be recorded as general government contributions for recipients of social benefits. There is no proportional relationship between the gross wages and salaries of the

disabled people and the social contributions paid for them; the social contributions are significantly higher than the gross wages and salaries.

- 5.209 The **consumption of fixed capital** is calculated from the capital stock estimations, in accordance with the perpetual inventory method. A detailed description is given in section 4.12. The consumption of fixed capital for the whole of sector S.15, including consumption of fixed capital for research and development, amounted to EUR 5.65 bn in 2010. It is determined for the individual industry in sector S.15, on the basis of capital formation differentiated by type of investment.
- 5.210 Data on **subsidies** is generated in the course of a separate subsidy calculation, in which all types of subsidies are allocated to industries. The data on subsidies is available only for NPISHs as a whole. The breakdown into the industries covered by the NPISHs is carried out using the respective percentage ratios for employee compensation.

Output, intermediate consumption and gross value added:

- 5.211 As stated above, the output of NPISHs is determined by adding together the intermediate consumption and the gross value added. **Intermediate consumption** is determined using intermediate consumption data (material/personnel costs ratios) derived from public finance statistics (accounting statistics for public budgets) or, in the case of research and development (WZ 72), from the research statistics. In the area of membership organisations (WZ 94), the approaches for calculating intermediate consumption are based on information from various churches, trade unions and political parties.
- 5.212 In sports, entertainment and recreation (WZ 93), an allowance for exhaustiveness is applied to the intermediate consumption to cover purchases of the services of self-employed trainers. The same level of adjustment is made for output, as output is determined by adding together intermediate consumption and gross value added. Corresponding balancing entries in the output of self-employed trainers are made in the corporations sector (see sections 3.22 and 3.24).

In summary, the following production side results are reported for NPISHs in 2010 for the individual industry divisions of WZ 2008:

**Table 5–8: Output, intermediate consumption and gross value added –
NPISH sector (S.15)**

Year 2010 at current prices

WZ 2008	Employees' remuneration	Consumption of fixed capital and other taxes on production ¹⁾	Gross value added	Intermediate consumption ratios ²⁾	Intermediate consumption	Output
No.	1	2	3 (1+2)	4	5(1*4/100)	6 (3+5)
	EUR bn			%	EUR bn	
72	1.278	1.792	3.070	56.6	0.723	3.793
85	6.489	0.555	7.044	25.2	1.636	8.680
86	1.116	0.025	1.141	53.2	0.594	1.735
87	2.923	0.071	2.994	53.2	1.555	4.549
88	12.988	0.345	13.333	53.2	6.911	20.244
90	0.122	0.003	0.125	101.6	0.124	0.249
91	0.141	0.034	0.175	101.4	0.143	0.318
93	1.395	0.510	1.905	³⁾	2.735	4.640
94	16.247	0.512	16.759	50.5	8.197	24.956

¹⁾ Less other subsidies

²⁾ Material costs divided by personnel costs

³⁾ Data not meaningful on account of adjustment for exhaustiveness in the area of sports (WZ 93).

These results are then integrated with the results for the industries in question.

- 5.213 The methodical treatment of research and development services as capital formation, which changed with the introduction of ESA 2010, initially has no effect on the calculation of gross value added in NPISHs, because of the application of the cost method (addition of expenditure items). There is, however, a second-round effect, because the purchased and own-account services for research and development which have been reallocated as capital formation will be depreciated. The expenditure item for the consumption of fixed capital, and thus also the gross value added, is therefore increased by the depreciation of the research and development services. In scientific research and development (WZ 72), the purchased research and development continues to be treated as intermediate consumption, so that the aforementioned effect of the depreciation of purchased research and development does not occur in this area. Other methods have also been adopted to ensure that this effect of writing down research and development in NPISHs does not pose any risks. Further details on the effect of the conceptual changes with regard to research and development activities in non-market producers may be found in section 5.10.3.

In summary, the following results of the production approach are reported for the NPISH sector (S.15) as a whole in 2010:

Table 5–9: Derivation of national accounts results in the production approach

Section NPISH: “Non-profit institutions serving households” (S.15)

Year 2010 in EUR (billions)

List	Output	Intermediate consumption	Gross value added
Source data.....	66.689	20.143	46.546
+ Data validation.....	0.000	0.000	0.000
= Sub-total	66.689	20.143	46.546
+ Own-account fixed capital formation ¹⁾	0.000	0.000	0.000
+ Changes in inventories of finished products and work in progress.....	0.000	0.000	0.000
= National accounts figures.....	66.689	20.143	46.546
+ Adjustments for exhaustiveness (N types)	1.323	1.323	0.000
= Balance sheet result.....	68.012	21.466	46.546
+ Conceptual adjustments	0.000	0.000	0.000
= National accounts result	68.012	21.466	46.546
+ Cyclical balancing	0.000	0.000	0.000
+ FISIM	1.152	1.152	0.000
+ Research and development.....	0.000	0.000	0.000
= Published figures	69.164	22.618	46.546

¹⁾ For conceptual reasons, own-account fixed capital formation is not explicitly stated in the production-side calculation.

Addition to WZ 94:

5.214 Non Profit Institutions Serving Non-Financial and Financial Institutions represent a special case and are allocated to NACE/WZ division 94 “Activities of membership organisations”. These NPISHs are “business, employers, banking and insurance associations and professional membership organisations”. Since the revision of the national accounts in 2014, they have been allocated to **the sectors of non-financial corporations (S.11) or financial corporations (S.12)**. In these cases, the subscriptions paid by the member companies should be treated as purchases of market-specific services (ESA 2010, paragraph 3.35). Because the necessary source data for such a calculation is not available in Germany, a calculation is performed instead using the **addition method** (as in the area of non-market production). The starting points are the compensation of employees calculated in the accounting of income on the basis of the number of employees and the average income, consumption of fixed capital and other net taxes on production. This gives the **gross value added**. The taxes are calculated in proportion to the compensation of employees. Alternatively, **intermediate consumption** may be estimated using ratios from the cost-structure statistics for auditors. Adding together gross value added and intermediate consumption produces the **output**.

5.9 General government final consumption expenditure

5.215 The final consumption expenditure of the general government is calculated by the following method:

Table 5–10: General government consumption expenditure by sector

Year 2010 in EUR (billions)

	S.13	S.1311	S.1312	S.1313	S.1314
Output of the general government sector (non-market production, including output produced for own final use)	359.819	66.380	158.326	107.568	27.545
– Output produced for own final use.....	11.935	3.522	7.893	0.451	0.069
– Sales from non-market production.....	58.912	13.501	20.029	25.247	0.135
+ Social transfers in kind (market production purchased by general government).....	204.364	0.306	3.694	22.806	177.558
= Final consumption expenditure of the general government sector (expenditure approach)	493.336	49.663	134.098	104.676	204.899
of which:					
Individual consumption.....	314.878	5.805	73.081	57.126	178.866
Collective consumption	178.458	43.858	61.017	47.550	26.033

The components of the calculation of general government output in the local kind-of-activity units with non-market production have already been mentioned in section 3.21. The statistical sources have also already been described. These sources cover all public budgets in Germany in their entirety.

- 5.216 The consumption of fixed capital is derived from the fixed asset account, in accordance with the perpetual inventory method (see section 4.12). The most important conceptual differences from the accounting data in these sectors are the inclusion of imputed social contributions for the insurance scheme for civil servants and the estimation of capital consumption.
- 5.217 Own-account production by the general government sector is effected entirely in kind-of-activity units within that sector and falls under the heading of non-market production. This relates primarily to own-account research and development conducted by universities and government research institutions for their own purposes, to be provided subsequently to the public free of charge, the services provided by the planning and building-control departments of local authorities in connection with the planning and supervision of public construction work, services provided by materials depots and own-account software. The output from these activities, assessed on the basis of cost elements, is deducted from the non-market production of the general government sector and is recorded as fixed capital formation.
- 5.218 The sales from non-market production comprise revenue from user charges and administrative charges in cases where the government levies charges for administrative services such as tests and inspections, revenue from primary or

secondary economic activities and revenue from concession and licence fees, in so far as such revenue does not constitute income from property (rent) or acquisitions less disposals of non-produced assets.

- 5.219 Social benefits in kind (market production purchased by general government) comprise expenditure by regional and local authorities, particularly on social assistance and war-victim support, and expenditure by the social-security authority, particularly for the services of doctors and dentists, for medicinal products, courses of treatment and therapeutic devices, for hospital services, for accommodation in nursing homes and similar establishments and for treatment at a health resort or spa. The benefits are made available directly to households by the service providers (doctors, pharmacies, hospitals, etc.) without being transformed by government intervention, and the government pays for them.
- 5.220 In the expenditure approach, the final consumption expenditure of the government sector is calculated by deducting own-account fixed capital formation (production by the public authorities for their own use) and the value of sales of non-market production from the total output of the general government sector and adding expenditure on social benefits in kind (market production purchased by general government).
- 5.221 In a supplementary calculation, the final consumption expenditure of the government sector as assessed by means of the expenditure approach may be converted into actual final consumption, making both individual and collective consumption recordable. Individual consumption comprises the social benefits in kind (market production purchased by general government) and the individually assignable benefits in kind in the domains of education, health, social security and sport, culture and recreation. The remainder is collective consumption.
- 5.222 Upon the introduction of ESA 2010, own-account and purchased research and development for the general government sector is no longer recorded as intermediate consumption, but as fixed capital formation, with the exception of purchased research and development for the "Scientific research and development" economic activity, which is still recorded as intermediate consumption as it is by convention part of the R&D production process.
- 5.223 In accordance with international standards, the cost method is used for the calculation of R&D output. According to this method, output is calculated by adding together the components of gross value added and intermediate consumption. Since this method is generally used in the general government sector (see also section 3.21), the corresponding cost items for research and development should be separated out. For this purpose, it was necessary to determine the R&D component in the activities of the general government units in question, since these units may provide other services apart from research. Deducting the R&D services sold to third parties from the total R&D output of the general government units yields the research and development general government produces for its own final use. Research and development in the general government sector is conducted predominantly by public universities and public research institutions.
- 5.224 Research and teaching are the two main characteristic activities of public universities. The statistics, however, only report the income and expenditure of individual universities as a whole. Higher education spending is divided into the subcomponents teaching and research using special allocation keys that are used already for calculating key monetary data on institutions of higher education (EVAS 21381). The R&D component is calculated individually for each public university.
- 5.225 If the public university is spun off, the underlying data is provided by the finance statistics of institutions of higher education, otherwise the accounting statistics are

used. The division of university research into own-account and research and development which is being sold is associated with the standard distinction between basic and third party funded research. Basic funds research predominantly relates to own-account research and development. However, those third party funds universities obtain from industry are sales connected to the delivery of research and development.

- 5.226 Besides the public universities, research is also conducted in particular by research institutions at federal and federal state level. These are further subdivided into so-called departmental research, which is performed by Federal Government and federal state institutions with R&D responsibilities, and other non-university research institutions subject to general government control. Within the calculation of R&D output, it was necessary to assess the share of R&D in their activities, based predominantly on information and methods of specialised statistics. The statistics on expenditure, revenue and personnel of public institutions and institutions receiving public funding for science, research and development were used as the data source for assessing the share of R&D for each individual institution of the general government sector. The institution-specific R&D coefficients are determined on the basis of the proportions of annual working time which scientific staff devotes to research and development. These proportions are multiplied by the total expenditure on science, research and development. These R&D coefficients can also be used to determine expenditure on research of general government research institutions, museums and libraries, broken down by type of income and expenditure (EVAS 21811).
- 5.227 The R&D component varies according to the main focus of the general government research institution. For example, the main focus of the Helmholtz Association of German Research Centres is on research and development, so its R&D component will be high. In contrast, in scientific libraries and museums research and development is conducted as a secondary activity. But even here a certain percentage is attributed to general government research expenditure as museum research. The R&D institutions of the general government sector were allocated to economic activities (of WZ 2008) depending on their predominant work. Departmental research, which takes place mainly in Federal Government and federal state institutions that focus predominantly on performing public administration functions, was consequently allocated to economic activity 84 “Public administration and defence; compulsory social security” as a secondary activity (see Figure 5–5).

Figure 5–5: Allocation of general government R&D institutions to economic activities

Area of activity according to WZ 2008	Sub-sector	Allocated general government units	Data source for calculation of R&D
Research and development	Federal Government; federal states; municipalities	R&D institutions	Statistics on expenditure, revenue and personnel of public institutions and institutions receiving public funding for science, research and development
Public administration and defence; compulsory social security	Federal Government; federal states	Departmental research institutions; Federal and federal state ministries	Cash and accounting results in the financial statistics; NABS81 – List of titles of the Federal Ministry of Education and Research
Education	Federal states	Higher education	Finance statistics of institutions of higher education
Library, archives, museums and other cultural activities	Federal Government; federal states	R&D institutions	Statistics on expenditure, income and personnel of public institutions and institutions receiving public funding for science, research and development

5.10 Gross fixed capital formation

5.10.1 Gross fixed capital formation in buildings and structures

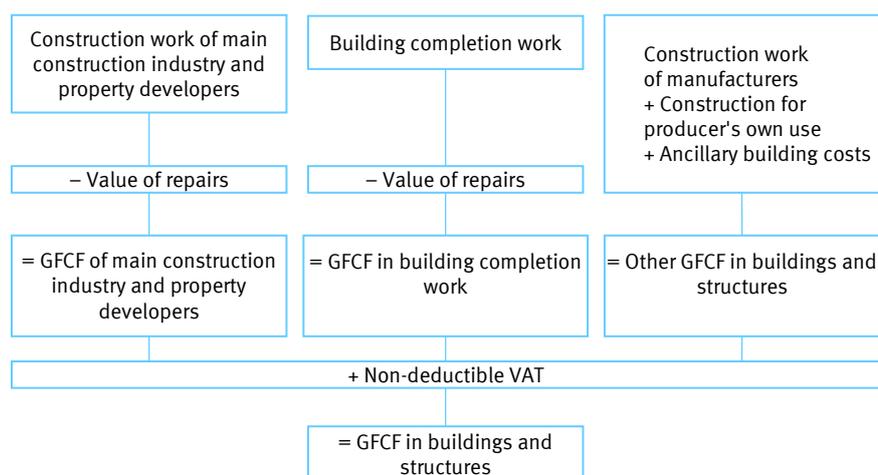
5.228 Gross fixed capital formation (GFCF) in buildings and structures comprise the acquisition of new dwellings and other buildings and structures as well as investment expenditure on existing buildings and structures. A net increase in the value of used buildings need not be quantified for the national economy since, by definition, purchases and sales of used buildings within an economic area will always cancel each other out. GFCF in buildings and structures include not only actual construction activity on buildings and other structures (roads, airports, canals, etc.) but also installations that are integrally linked to these buildings and structures, such as lifts, heating, ventilation and air-conditioning systems, landscaping, gardens and fencing. Moreover the value of services associated with the production and sale of buildings and land transfer, such as the services of architects and estate agents, also form part of capital expenditure on buildings and structures. Building work performed by investors themselves and clandestine building work are also counted as GFCF in buildings and structures. The valuation of GFCF in buildings and structures is effected at purchasers' prices, which include non-deductible VAT. The structures built by

⁸¹ Nomenclature for the analysis and comparison of scientific programmes and budgets (NABS).

investors for their own use are assessed at the basic prices for comparable goods and services, including an imputed profit margin. The share of GFCF in buildings and structures at EUR 237.122 bn amounted to 9.2 % of GDP in 2010.

- 5.229 The starting point for calculating GFCF in buildings and structures is the information from companies and businesses providing construction work and allied services. This indirect calculation method has considerable advantages, because statistical data from the constructors' side are more comprehensive and more readily available than they would be if a direct estimate were made on the basis of investors' data. The elements of the calculation are shown in the Figure 5–6 below.

Figure 5–6: Calculation of GFCF in buildings and structures



- 5.230 First, the results for main construction industry and building completion work each have to be reduced by the figure for pure maintenance work, since this counts as intermediate consumption. Other GFCF in buildings and structures not within the construction industry are assessed separately and are also recorded as part of GFCF in buildings and structures. Finally, the applicable amounts of non-deductible VAT are assessed and added to the relevant results. The following table shows the results of this calculation for the various activities:

Table 5–11: GFCF in buildings and structures

Year 2010 in EUR (billions)

Construction work of main construction industry and property developers.....	65.052
Building completion work.....	69.477
Construction work of manufacturers.....	13.699
Construction for producer's own use.....	28.574
Ancillary building costs.....	33.756
Non-deductible VAT.....	26.564
GFCF in buildings and structures, total.....	237.122

- 5.231 The value of GFCF in buildings and structures is assessed by calculating the totals for eight different types of construction, namely dwellings, agricultural buildings and structures, industrial and commercial buildings, public buildings, buildings for non-profit institutions, industrial and commercial structures other than buildings, public

highways and other public structures besides buildings. This method which differentiates construction categories helps in adjusting prices and enables compilers to reconcile the results with information from other sources, particularly the public finance statistics on government GFCF in buildings and structures.

a) Construction work of main construction industry and property developers

- 5.232 **Main construction industry** includes the economic activities “Construction of residential and non-residential buildings” (WZ 41.2), “Civil engineering” (WZ 42.0) “Demolition and site preparation” (WZ 43.1) and “Other specialised construction activities” (WZ 43.9). The baseline value for the assessment of output from main construction industry activities is annual construction output. This figure is obtained by means of an annual survey of businesses in the main construction industry (EVAS 44211). Annual construction output is the total value of the building work performed during the accounting year by businesses in the main construction industry, including their own work as subcontractors as well as work performed for their account by external businesses and subcontractors. It includes construction work for third parties and for the business itself (own-account construction) for which full payment has been made or which is in progress and has not yet been paid for.
- 5.233 The annual survey covers enterprises with 20 or more employees, and so its results have to be supplemented by the annual construction output of businesses with 1 to 19 employees. For this reason, the turnover of businesses with 1 to 19 employees is taken from the annual supplementary survey of production units in the domain of main construction industry (EVAS 44231). Since this survey is conducted at works level, the value of turnover that emerges from it must be adjusted to eliminate duplication of data. Duplication occurs when turnover from units included in the supplementary survey is already contained in the results of the annual survey of enterprises in cases where the units in question are part of a larger enterprise.
- 5.234 The figures for annual construction output must be reduced by the cost of external labour (subcontracting), since these amounts are also included in the annual construction output or turnover for this subcontractor. Unless this adjustment is made within the investment calculation, the total output from main construction activities will be overstated. The data on the cost of external labour is derived from the cost-structure survey in main construction industry (EVAS 44253) and from the structural survey of small enterprises in the building industry (EVAS 44252). An estimated allowance of 2.5 % is added to the annual construction output of all enterprises for imputed statistical under-coverage. The value of construction work performed by foreign enterprises, if not included in the reports on the construction surveys, is derived from the Deutsche Bundesbank's Balance-of-Payments statistics and added to the annual construction output figure.
- 5.235 An additional special item covers production drilling. This comprises the annual construction output from economic activity WZ 43.13 “Test drilling and boring” for construction, geophysical, geological or similar purposes and the turnover from economic activity WZ 09.10.0 “Service activities incidental to oil and gas extraction, excluding surveying”; part of this turnover is recorded under the heading of mineral exploration and evaluation (intellectual property products, see also section 5.10.4) and part is recorded as production drilling under the heading of GFCF in buildings and structures.

Table 5–12: GFCF of main construction industry

Year 2010 in EUR (billions)

Annual construction output by enterprises with 20 or more employees, excluding test drilling and boring	57.011
Annual construction output by enterprises with 20 or more employees	57.078
– Test drilling and boring WZ 43.13	0.067
+ Construction output by enterprises with 1-19 employees	26.850
Construction turnover in enterprises with 1-19 employees	27.582
– Mineral exploration and evaluation	0.044
– Double counting of units with 1-19 employees	0.688
= Annual construction output for all units	83.861
– Cost of external labour	20.666
= Annual construction output excluding cost of external labour	63.195
+ Upward adjustment for statistical undercoverage (2.5 %)	1.580
+ Construction output of foreign enterprises	0.899
= Construction work of main construction industry	65.674
+ Production drilling	0.205
– Value of repairs	3.875
= GFCF in main construction industry, excluding VAT	62.004

5.236 In the German system of national accounts, repairs which do not generate an increase in value are not included under the heading of GFCF in buildings and structures. Such repairs include expenditure on maintenance, which forms part of intermediate consumption. Intermediate consumption is assessed from the VAT statistics (EVAS 73311) by estimating the part of the turnover comprising actual repair expenses in a detailed breakdown by industries. It is assumed that capital expenditure is involved in most industries with main construction activities (with a 0 % repair ratio) and actual repair expenses arise in only a few selected areas.

Table 5–13: Repairs in main construction industry

Year 2010

WZ 2008		%
41.20.0	Construction of buildings	7
43.91.1	Erection of roofs, roof covering and related plumbing work	25
43.99.2	Erection of chimneys and industrial ovens	20
43.99.9	Other building completion	5
	Remaining economic activities of primary construction	0
	Total main construction	5.9

The resultant repair ratio is then applied to the figure for main construction industry output, resulting in an amount of EUR 3.875 bn for repairs.

5.237 The baseline value for the assessment of construction work of property developers is the gross output, which can be taken from the cost-structure survey of enterprises with 20 or more employees (EVAS 44253) and the structure survey of enterprises with 1-19 employees (EVAS 44252). The figures must be adjusted for the cost of external labour (subcontracting).

Table 5–14: GFCF by property developers

Year 2010 in EUR (billions)

Gross output		7.618
Output by enterprises with 20 or more employees	1.956	
+ Output by enterprises with 1-19 employees	5.662	
– Cost of external labour		4.570
= GFCF by property developers, excluding VAT.....		3.048

b) Building completion work

5.238 **Building completion work** comprise the output of industries “Electrical, plumbing and other construction installation activities” (WZ 43.2) and “Building completion and finishing” (WZ 43.3), less the cost of external labour and of repair work that does not increase the value of the repaired asset and the output of manufacturers' building completion work.

5.239 The starting point for determining the construction work of industries “Electrical, plumbing and other construction installation activities” (WZ 43.2) and “Building completion and finishing” (WZ 43.3) consists of the turnover figures in the VAT statistics (EVAS 73311). Goods for resale are first deducted from this amount, followed, as in main construction industry, by the cost of external labour, which also plays a not insignificant role in building completion work. These deductions are based on data from the cost-structure surveys in building completion work (EVAS 44254) and the structural survey of small enterprises in the construction industry (EVAS 44252).

Table 5–15: GFCF in building completion work

Year 2010 in EUR (billions)

Turnover taken from the VAT statistics	106.536
– Goods bought for resale (4 %)	4.261
= Turnover, excluding goods bought for resale	102.275
– Cost of external labour.....	14.672
= Construction work WZ 43.2 and 43.3, excluding cost of external labour.....	87.603
+ Building completion work of manufacturers	3.098
– Value of repairs.....	21.224
= GFCF in building completion work, excluding VAT	69.477

5.240 Besides the aforementioned building completion work, GFCF in buildings and structures also include **industrial bulding completion work carried out by manufacturing enterprises**. This includes lifts, central-heating systems, heating, ventilation and air-conditioning (HVAC) systems, etc., which are manufactured and installed by industrial companies. The valuation of these forms of building completion work is carried out for selected categories of goods on the basis of the results from the quarterly output survey (EVAS 42131) and the external trade statistics (EVAS 51141, 51231). The figures allow calculation of the domestic supply of the relevant products (output – exports + imports). A product–specific fixed capital formation ratio is applied to the domestic supply to derive the overall value of fixed capital formation. For each product this product–specific fixed capital formation ratio indicates which share of its domestic supply is used for fixed capital formation. GFCF in machinery and equipment is generally assessed by this method (see section 5.10.2). For 2010, industrial building completion work carried out by manufacturing enterprises is valued at EUR 3.098 bn.

Table 5–16: Fixed capital formation ratios for building completion work by product category

Year 2010 in %

GP no ¹⁾	Product category	GFCF ratio
1623 11	Wooden windows, doors and frames	10
1623 19 005.9	Builders' joinery and carpentry.....	10
2223 12	Baths, showers and other sanitary fittings	15
2223 14	Plastic windows, doors and frames	15
2433 30	Panels of coated steel sheet	15
2511 23 500	Shutters and structural parts of sheet steel	15
2511 23 693.7	Glass roof constructions, collapsible and roll-up grilles of steel...	25
2511 23 705.7	Roller shutters, collapsible and roll-up grilles of aluminium	25
2512 10 301,2,3	Iron and steel gates, doors and windows	20
2512 10 304,5,6	Sliding doors, other doors, fire doors of iron and steel	25
2512 10 307.9	Frames and panelling of iron and steel	20
2512 10 310.20	Iron and steel windows.....	15
2512 10 501	Rolling doors of aluminium.....	20
2512 10 502,3,4,5	Sliding doors, other doors and panelling of aluminium	25
2512 10 507.8	Aluminium windows.....	15
2521 11	Radiators	15
2521 12 003,5,7	Central heating boilers	80
2529 11 203,303,509	Heating boilers, hydraulic boilers and other steel vessels >300l...	15
2591 11 001.2	Heating boilers, hydraulic boilers and other steel vessels <300l...	15
2591 12	Iron and steel drums and similar containers	5
2599 11	Metal sanitary items.....	15
2599 21 500	Doors and compartments for steel safes	100
2599 29 373.9	Steel or sheet-steel building materials.....	15
2751 25	Instant water heaters, other electric water heaters	20
2751 26	Electric storage heaters and other electric heaters	20
2752 11.2	Non-electric heaters and cookers.....	20
2752 14	Non-electric water heaters.....	50
2813 14 170	Acceleration pumps for heating systems	15
2822 16 301,2,6	Passenger lifts, goods lifts, escalators	100
2822 16 309	Other lifts, electric	60
2822 16 5.7	Other lifts, hydraulic	100
2825 13 801	Compression heat pumps up to 15 kW	30
2825 13 809, 909	Compression heat pumps from 15 kW upwards and similar	15
2829 22	Fire extinguishers	60
2893 15 801,3,8	Large boiler systems	100
2893 15 808	Other equipment for cooking	25
3100 12	Other seating made of wood.....	10

¹⁾ German Systematic Classification of Commodities for Production Statistics, 2009.

5.241 For the individual classes and subclasses of building completion work activity, the value of repairs which do not generate an increase in value is estimated as a percentage of total turnover. Compared to main construction industry, substantially higher repair ratios are assumed, since building completion work is more prone to repairs. Applying these to the turnover from the VAT statistics (EVAS 73311) produces a figure for 2010 of EUR 21.224 bn.

Table 5–17: Repair ratios for building completion work

Year 2010 in %

WZ 2008 No	Building completion work	Repair ratio
43.21	Electrical installation	20
43.22	Plumbing, heat and air conditioning installation	25
43.29.1	Insulation work activities	10
43.29.9	Other building completion n.e.c.	20
43.31	Plastering	25
43.32	Joinery installation.....	20
43.33	Floor and wall covering.....	23
43.34.1	Painting and lacquering.....	45
43.34.2	Glazing	10
43.39	Other building completion.....	12
25.62	Machining n.e.c.	29
	Total.....	23.4

c) Construction work of manufacturers

5.242 Besides industrial building completion work, manufacturing also accounts for another type of GFCF in buildings and structures. **Prefabricated construction** covers some 100 product categories in the German Systematic Classification of Commodities for Production Statistics. The same source statistics and method are used for the valuation of prefabricated construction as are used for industrial building completion work. The following Table 5–18 shows the fixed capital formation ratios applied. The value established for 2010 amounts to EUR 13 699 m.

Table 5–18: Fixed capital formation ratios for prefabricated construction by product category

Year 2010 in %

GP no ¹⁾	Product category	GFCF ratio
1623 19 001.3	Builders' carpentry and joinery	10
1623 19 007	Sauna cabins	70
1623 20	Prefabricated timber buildings	100
2223 20	Prefabricated plastic buildings	95
2229 26 300	Perforated buckets used to filter water in drains, of plastic	15
2343 10 330,50,90	Electrical insulators.....	30
2361 11 600	Pipes of cement, concrete	10
2361 12 001.3	Wall elements, ceiling tiles	15
2361 12 002	Sound insulating walls	40
2361 20	Prefabricated cement buildings, precast concrete units.....	100
2369 19 806	Railway sleepers of cement, concrete	30
2369 19 808	Steel and prestressed concrete masts.....	5
2410 02 520	Rails, sleepers, points	40
2420 11 100 to 2420 14 000	Pipes and tubes of iron or steel	50
2420 21 100 to 2420 35 000	Welded pipes and tubes of iron or steel	60
2451 20	Tubes, pipes of cast iron	70
2511 10	Steel or aluminium buildings	95
2511 21 003	Road bridges and bridge-sections of iron or steel.....	100

¹⁾ German Systematic Classification of Commodities for Production Statistics, 2009.

(Table 5–18 continued)

GP no ¹⁾	Product category	GFCF ratio
2511 21 005	Signalling cable bridges of iron or steel.....	95
2511 22 000	Iron or steel towers and lattice masts	50
2511 23 105.7	Iron or steel arching, formwork frames	95
2511 23 300	Iron or steel constructions for hydraulic engineering	100
2511 23 611 to 692	Other iron or steel constructions	95
2511 23 696.699	Covers, grates, other structures of iron or steel	70
2511 23 701,3,9	Components, skeleton structures of aluminium	95
2529 11 100	Vessels of iron or steel holding 300 litres and more, for gas, etc.	95
2529 11 309	Other steel vessels for fluids holding 300 litres and more	75
2529 11 509	Other iron or steel vessels for solid materials holding 300 litres and more.....	30
2529 11 700	Vessels of aluminium, etc. holding 300 litres and more for all kinds of substances	75
2529 12 000	Vessels for holding gases	55
2593 12 500	Flex, cables, ropes and other articles of copper.....	15
2593 12 700	Flex, cables, ropes and other articles of aluminium.....	5
2599 29 410	Sewerage installations	15
2630 50 800	Burglar alarms for houses	100
2630 60 000	Parts for burglar alarms	10
2731 11 003	Cables with optical fibres, telecommunication cables	40
2732 13 404.5		
804.5, 14 000	Electricity conductors.....	35
2790 12 300	Electrical insulators of any material	80
2790 20 200.500	Display boards with LCD, LED displays	100
2790 33 300.500	Parts for traffic signalling and safety equipment.....	10
2790 70 100.300	Electric traffic signalling and safety equipment	70
2822 18 200	Aerial railways, chair lifts and T-bar lifts, etc.	95
3020 40 701	Fixed track material for railway tracks.....	100
3311 12 002	Repair and maintenance of tanks and vessels	10
3320 12 001	Installation of self-produced metal structures.....	100
3320 12 006	Installation of other metal products.....	25

¹⁾ German Systematic Classification of Commodities for Production Statistics, 2009.

d) Construction for producer's own use

5.243 Producers' own output refers to construction work on dwellings by their owners and buildings or other structures erected by enterprises, government bodies or non-profit institutions for their own use.

Table 5–19: Construction for producer's own use

Year 2010 in EUR (billions)

Construction work on dwellings by their owners	20.069
Buildings erected by enterprises, government bodies or non-profit institutions for their own use	8.505
Total construction for producers' own use.....	28.574

5.244 **Construction work** undertaken by households includes the unpaid assistance of neighbours and family members as well as the value of clandestine work. Since this

work does not feature in tax returns or statistical surveys, its value has to be estimated. The estimates are based on the statistics on construction activity (EVAS 31111, 31121). These statistics contain details of the number of building permissions issued and completions reported and the construction cost of residential buildings, subdivided into buildings with one, two and three or more dwellings. The use of an early indicator, namely the number of building permissions issued, in conjunction with a late indicator, i.e. the number of completions, is designed to ensure that the estimated value of investors' own construction output can be assigned to the actual period when the housing in question was being built. As well as the construction of new buildings, these figures also cover conversion work for which a building permission is required. From the assessed construction costs for each housing category, an estimate is made of investors' own construction as a percentage of total construction output. In this way the following percentages of investors' own construction as a whole were obtained for 2010:

Table 5–20: Ratio of investors' own construction to total construction costs on dwellings

Year 2010 in %		
Residential buildings with	1 dwelling.....	30
	2 dwellings.....	21
	3 or more dwellings.....	4
Weighted average		22.2

- 5.245 The figure of 22.2 % for 2010 is applied to GFCF in dwellings (excluding investors' own construction and the cost of ownership transfer on land) as shown in the investment account, which produces a figure of EUR 20.069 bn in the national accounts for investors' own construction output.
- 5.246 The valuation of **buildings and other structures erected by enterprises, government bodies or non-profit institutions for their own use** is effected in cooperation between the compilers of the GDP production approach and the compilers of the GDP expenditure approach. Data on own-account fixed capital formation in manufacturing, mining and quarrying, commerce and transport and communication, as well as on own-account production of machinery and equipment in the construction industry are compiled in the framework of the production approach (see Chapter 3). The principal source data are the results of the (cost) structure surveys which are conducted in various industries. Fixed capital formation by the government in its own assets is calculated on the basis of the public finance statistics as part of the assessment of the consumption expenditure for the general government sector. An estimated profit margin is added to the production cost, since output produced for the producer's own final use has to be valued at the basic prices of comparable market goods and services. Estimates are made of the figures for own-account construction output in the domains of agriculture and non-profit institutions serving households.

Table 5–21: Buildings constructed for own use

Year 2010 in EUR (billions)	
Agriculture.....	0.637
Electricity, gas and water supply	0.803
Extractive and manufacturing industries, construction industry	3.147
Transport and communication.....	2.347
Other services	1.571
Buildings constructed for own use	8.505

e) Ancillary building costs

5.247 Ancillary building costs include domestic connection costs for electricity, gas, water/sewage and telephone services, the provision of garden plots and landscaped areas, the cost of architects', civil engineers' and surveyors' services, charges levied by local building authorities and the cost of ownership transfer on land (court and notarial fees, land transfer tax). Before the assessment of the various cost items is explained, the following table shows their relative significance in monetary terms:

Table 5–22: Ancillary building costs

Year 2010 in EUR (billions)

Connection costs for public utilities	0.285
Provision of garden plots	4.274
Architects', civil engineers' and surveyors' services	17.856
Fees levied by local building authorities	0.632
Costs of ownership transfer on land	10.709
Ancillary building costs	33.756

5.248 Neither official statistics nor the associations of electricity, gas and water companies possess data on the **cost of domestic connections** to the public utilities. For this reason, the costs of these connections have to be estimated on the basis of three sources:

- the number of completed construction projects from the statistics on construction activity (EVAS 31121),
- a survey of several utility companies in 1995, conducted by the German Gas and Water Federation (Deutsche Vereinigung des Gas- und Wasserfaches) with a view to establishing average connection costs, and
- a detailed statement of costs for all types of utility connection, compiled by ESWE, the department of works for the city of Wiesbaden, for the years 1973 to 2004.

At the same time, it must be borne in mind that the local utility companies hire external contractors for most of their civil-engineering projects, which means that this output is covered by the construction statistics and is therefore already contained in the output figure for the main construction industry. New telephone connections are also included on the basis of information from Deutsche Telekom.

Table 5–23: Connection costs for public utilities

Year 2010

Completions of residential and other buildings	Number	111 330
Average connection costs per building	EUR	12 789
Total connection costs	EUR bn	1.424
Output of utility companies included (20 %) in above figure	EUR bn	0.285
= Total domestic and business connection costs	EUR bn	0.285

5.249 For the initial provision of **garden plots and landscaped areas**, the basis of assessment is the turnover of gardening and landscaping businesses as shown in the VAT statistics (EVAS 73311). With the aid of the results of a specialised survey of gardening and landscaping businesses by the Ifo Institute for Economic Research, the ratio of turnover from the creation of new gardens and landscaped areas to the total turnover

of these businesses has been set at 60 %. The value of GFCF in this category for 2010 works out at EUR 4.274 bn.

- 5.250 The turnover of **architects, surveyors and structural engineers** is also provided by the VAT statistics (EVAS 73311). The fixed capital formation ratios have to be estimated. The output of surveyors' offices also includes geological examinations, land surveying, meteorological activities and geodetic surveying, most of which has to be classed as intermediate consumption. A GFCF ratio of 100 % is applied to the turnover of firms of architects, approximately 80 % to firms of project-management consultants and design engineers and to building consultancy firms and 50 % to firms of surveyors. The value of GFCF in this category for 2010 works out at EUR 17.856 bn.
- 5.251 The **charges levied by local building authorities** are assessed on the basis of figures from the local-authority budgets (EVAS 71717) for administration of building activity and urban planning, surveying and building control for the year 2010 and yielded a total of EUR 0.632 bn.
- 5.252 The **cost of ownership transfer on land** covers the output of estate agents, notaries public and courts of law, as well as payments of land transfer tax. The amount of revenue from land transfer tax is obtained from the public finance statistics (EVAS 71211). The turnover of estate agents and notaries public is recorded in the VAT statistics (EVAS 73311). A large part of an estate agent's turnover comes from brokering property leases, from property management, from devising financial plans and arranging financial services and from brokering the sale of property abroad. The fixed capital formation ratio of 50 % is based on an annual comparative survey conducted by the University of Cologne, in which some 360 estate agencies are asked for a breakdown of their turnover. Notaries also provide numerous services which cannot be classified as GFCF in buildings and structures. Examples of these other services are the preparation of instruments of incorporation and constitutions for the establishment of new companies, articles of association or similar instruments in connection with the creation of new partnerships, wills, trust agreements, etc. The fixed capital formation ratio for notaries public is estimated at 45 %. Court costs amount on average to 55 % of notarial costs. For 2010, costs of ownership transfer on land are reported of EUR 10.709 bn, which are attributable in full to GFCF in buildings and structures. A separate proportion is no longer estimated for undeveloped land.

f) Non-deductible VAT

- 5.253 The primary statistical data on specific construction works that are used in the assessment of GFCF in buildings and structures are recorded without VAT. Since these primary sources give no indication of the level of fiscal liability that applies to each individual construction category, the valuation of the various categories of construction work is initially effected without the addition of VAT. However, when it comes to expressing the GFCF in buildings and structures in terms of purchasers' prices, an amount of VAT must always be added to the net values in cases where the investors are not entitled to deduct VAT. Because of the statutory regulations in this domain, GFCF in buildings and structures can be subject to varying levels of VAT liability, and this means that different rates are applied to the eight construction categories. When non-deductible VAT is assessed, a distinction must be made between two groups of investors:
- Investors are not normally entitled to deduct VAT if their own turnover is not taxable. VAT is therefore added to the value of purchases made by such investors. This group of investors includes all industries in which, in addition to non-financial corporations (sector S.11), representatives of other sectors (e.g. general government S.13) also act as investors. This includes, for example, the industries "Public administration and defence; compulsory

social security” (WZ 84), “Real estate activities” (WZ 68) and “Education” (WZ 85).

- Investors are entitled to deduct VAT at source if their own turnover is taxable. Purchases of tangible assets by this group are VAT-exempt. This is the case for most industrial and commercial companies.

5.254 VAT liability in respect of fixed capital formation is initially assessed for industries through investor accounting. So-called input-tax ratios are used for this purpose. These input-tax ratios indicate the percentage of fixed capital formation on which the statutory rate of VAT is payable in each industry. Input-tax ratios are assessed in the context of the input-output account with the aid of the VAT statistics (EVAS 73311). In this way, a rate of VAT liability is fixed for each industry and is subsequently distributed among the various construction categories.

Table 5–24: Non-deductible VAT

Year 2010 in EUR (billions)

Dwellings.....	16.088
Industrial and commercial buildings	5.135
Public buildings.....	1.913
Road construction	1.501
Industrial and commercial structures other than buildings.....	0.251
Other public structures besides buildings	1.248
Non-profit institutions serving households.....	0.428
Total non-deductible VAT	26.564

5.10.2 Gross fixed capital formation in machinery and equipment and military weapons systems

5.255 Movable capital assets such as new machinery, equipment and vehicles constitute the core of gross fixed capital formation (GFCF) in machinery and equipment, which are assessed and recorded separately in the German national accounts. Since, in accordance with ESA 2010 paragraph 3.127(3), they form part of gross fixed capital formation, the definition set forth in paragraph 3.124 also applies to investments in machinery and equipment. This means that the movable assets must have been procured or produced during the reference period to be used repeatedly or continuously for production purposes in Germany for at least one year and that the value of any such assets sold during the reference period must be deducted. Equipment permanently installed in buildings, such as boilers and intercom facilities, is not considered as investments in machinery and equipment, but as investments in construction. With the introduction of ESA 2010, weapons and weapons systems used exclusively for military purposes are now also recorded as capital formation. In Germany they are attributable exclusively to general government (sector S.13). For reasons of secrecy, they are only published aggregated with investment in machinery and equipment, although they do not belong to ESA balance sheet item AN.113, i.e. to machinery and equipment, but form a separate category (AN.114).

The general principle of valuation at purchasers' prices (para. 3.135) means that the cost of ownership transfer, trade and transport margins, installation costs and non-deductible VAT are all included in the assessed price. Own-account production is valued at the basic prices of comparable goods. In accordance with the ESA system, the rule is that the ownership concept is applied for the allocation to areas of activity

rather than the user concept. Consequently, where operating leasing of assets takes place, such assets are recorded as the lessor's fixed capital (para. 3.130(a)(3)).

At a total value of EUR 175.909 bn in 2010, GFCF in machinery and equipment account for around 6.8 % of GDP.

5.10.2.1 Three basic elements of equipment accounting

- 5.256 In the German national accounts, investment in machinery and equipment is calculated by means of two independent methods, which should in theory lead to the same result: Survey-based investor accounting involves asking end users directly how much they have invested in machinery and equipment, while model-based commodity flow (CF)⁸² accounting proceeds from the domestic, highly broken down, supply of goods (output + imports – exports) and by estimating, in each case, the extent to which they are invested as fixed capital and taking into account various other items, arrives at an indirect calculation of the GFCF in machinery and equipment.
- 5.257 At first glance, investor accounting may appear superior, because unlike the commodity flow method it is based on genuine survey data, requires fewer assumptions and offers structure information on investors. Investor accounting, however, does not supply any of the infra-annual reports that are important for economic analyses, but only annual reports, which, moreover, are not available until 15 months after the end of the reporting year. In addition, the service categories are still not fully covered; this applies in particular to WZ divisions 86-93 and the activities of NPISHs (S.15). On the other hand, while the commodity flow method does indeed display the usual problems associated with a model-based approach, since it is forced to combine sometimes inconsistent source statistics with a variety of assumptions and estimates, it is nonetheless based on very detailed source data, available on a monthly or quarterly basis, that fully covers the potential spectrum of capital goods and is ready no more than four months after the end of each quarter.
- 5.258 The fact that the advantages and disadvantages of the two approaches are like a mirror image of each other explains why they are used in conjunction in Germany and why they complement each other: The first basic element, the **commodity flow method**, is used to compile the current quarterly accounts and, from these, preliminary figures for the annual accounts. When the results of the second basic element, the **investor accounting**, are received, these preliminary figures can be revised accordingly. The individual – in some cases divergent – items of the two approaches are checked and then reconciled, among other things by means of time-series comparisons. It is, for example, quite possible to make use of a degree of latitude in extrapolations and estimates when making allowance for economic activities that are not covered by investor accounting, but also for grey areas in the estimation parameters of the commodity flow method.
- 5.259 The aforementioned reconciliation does not yet lead to any consistent relationship between the investment expenditures of the investing economic activities and their volumes of capital goods in the reporting period. These deeper links are depicted in the third basic element, the **GFCF cross-classification matrices**, in which the results of the commodity flow method and the investor accounting form the two marginal totals, which are then broken down in great detail in the respective other dimension in the enclosed matrix. The inner matrix structures also show the product structure for each investor category defined in the WZ classification and the purchaser structure for each product type. Given the inadequate statistical basis for the matrix structures, it is not

⁸² In the original text, the German term “Güterstromrechnung” and the English abbreviation “CF” are used interchangeably.

possible, as in the independent input-output account of the national accounts, to estimate or even predict marginal totals from the present matrix elements. It is rather a case of deriving the new matrix elements from these marginal totals, starting from the historical matrix structures and using a mathematical iteration method that gradually eliminates the computational residuals, thus producing a complete and non-contradictory overall system. Finally, experts check the plausibility of the inner structures.

- 5.260 This matrix system has two stages: At each stage, the core is a long matrix of machinery and equipment categories with industries along the vertical axis. In the long matrix, the GFCF in machinery and equipment assessed at basic costs in the relevant 93 industries distinguished in the German national accounts (classified in accordance with WZ 2008) is divided into 203 capital goods (broken down in accordance with GP 2009).⁸³ These vertical axis totals (203x93) are concentrated after the annual reconciliation procedure in terms of product categories to form a short matrix (15 product categories x 93 areas of activity). These product level matches CF Categorisation Group 2 (see section 5.10.2.2.e and table 5-28). At the short matrix level, the next step involves adding all the supplementary items from the commodity flow account (see also section 5.10.2.3.b and Figure 5-11) to complete the transition from the basic price concept to the purchasers' price concept. The last step once again requires a short matrix reconciliation with the margin product and investor totals of the new machinery and equipment.
- 5.261 The method described here shows that differing assessments of the quality of the diverse data sources can lead to differing adjustment mechanisms and reconciliation outcomes. This, however, applies to all accounting systems that are fed from various mutually independent and possibly fallible sources. So the ultimate production of a matrix of new annual figures which is coherent and plausible in its structure must not blind us to the scope that exists for guesswork in certain of the published overall results.
- 5.262 It is evident from the above that the reconciliation process used to obtain the annual value of GFCF in machinery and equipment, broken down into areas of activity and product categories, largely determines the structures of the GFCF cross-classification matrix as they develop from one year to the next. In addition, the matrix structures should, if possible, be reinforced with an independent data input, which is, however, largely absent. Only the registration statistics of the Federal Motor Transport Authority provide relevant data cross-classified by industry and by cubic-capacity class or commercial vehicle category. However, in the motor vehicle area there are likely to be considerable inaccuracies in the classification of economic activities – largely due to survey errors – which do not allow for just a simple transfer of the structures used by the Federal Motor Transport Authority. For all other product types, there are no official statistics or other statistics which focus specifically on capital goods.
- 5.263 GFCF cross-classification matrices, however well or poorly substantiated they may be, are indispensable elements of certain internal operations. They play an especially crucial role in current GDP accounting in the following practical ways:
- They help to determine the weighting models for price indices by investing industries, in other words to determine the price-adjusted figures in the investor account,

⁸³ This level of detail in the breakdown of goods matches that of CF Categorisation Group 1, which is shown in table 5-27.

- They serve to establish the distribution by duration of use in connection with the calculation of capital stock and depreciation by investing industry,
- They serve to express various values from the investor side, such as non-deductible VAT and machinery and equipment produced and retained for producers' own use, in terms of product categories for the purposes of CF accounting (see points 5.10.2.3.a and b).

In view of the weak statistical basis for the structures, the Federal Statistical Office has only published the results it has obtained from the cross-classification matrices in connection with its delivery obligations to Eurostat. Table 5–25 below shows excerpts of the corresponding matrix structures.

Table 5–25: GFCF cross-classification matrix, 2010 – new GFCF in machinery and equipment

at current prices

NACE Sect.	Industries	CPA product groups						TOTAL
		Computer, electronic and optical products	Electrical equipment, other manufactured goods	Machinery and equipment n.e.c.	Motor vehicles, trailers and semi-trailers	Other transport equipment	Remaining equipment	
		CPA No. 26	27, 32	28	29	30	25, 31, 33, parts of 13-16, 18, 22-24, weapons systems	New machinery and equipment
EUR (millions)								
A	Agriculture, Forestry and Fishing.....	96	238	4256	326	78	629	5623
B	Mining and Quarrying.....	20	11	1049	28	52	51	1211
C	Manufacturing.....	4245	2038	24088	4212	1048	7769	43400
D, E	Electricity, Gas, Steam and Air Conditioning supply; Water supply; Sewerage, Waste Management and Remediation Activities.....	811	2884	2562	977	127	2691	10052
F	Construction.....	202	84	1801	1392	67	372	3918
G, H, I	Wholesale and retail trade; repair of motor vehicles and motorcycles; Transportation and Storage; Accommodation and Food Service Activities.....	3978	1454	4465	8259	12891	4424	35471
J	Information and Communication.....	3451	464	1046	1286	506	1466	8219
K	Financial and Insurance Activities.....	1158	79	151	469	71	440	2368
L, M, N	Real Estate Activities; Professional, Scientific and Technical Activities; Administrative and Support Service Activities.....	6323	3135	6169	27816	5620	4822	53885
O, ..., S	Other Industries.....	5014	6189	2737	3903	1883	7507	27233
TOTAL	All industries.....	25298	16576	48324	48668	22343	30171	191380
all product groups =100								
A	Agriculture, Forestry and Fishing.....	0.4	1.4	8.8	0.7	0.3	2.1	2.9
B	Mining and Quarrying.....	0.1	0.1	2.2	0.1	0.2	0.2	0.6
C	Manufacturing.....	16.8	12.3	49.8	8.7	4.7	25.7	22.7
D, E	Electricity, Gas, Steam and Air Conditioning supply; Water supply; Sewerage, Waste Management and Remediation Activities.....	3.2	17.4	5.3	2.0	0.6	8.9	5.3
F	Construction.....	0.8	0.5	3.7	2.9	0.3	1.2	2.0
G, H, I	Wholesale and retail trade; repair of motor vehicles and motorcycles; Transportation and Storage; Accommodation and Food Service Activities.....	15.7	8.8	9.2	17.0	57.7	14.7	18.5
J	Information and Communication.....	13.6	2.8	2.2	2.6	2.3	4.9	4.3
K	Financial and Insurance Activities.....	4.6	0.5	0.3	1.0	0.3	1.5	1.2
L, M, N	Real Estate Activities; Professional, Scientific and Technical Activities; Administrative and Support Service Activities.....	25.0	18.9	12.8	57.2	25.2	16.0	28.2
O, ..., S	Other Industries.....	19.8	37.3	5.7	8.0	8.4	24.9	14.2
TOTAL	All industries.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Table 5–25 continued)

		all industries =100						
A	Agriculture, Forestry and Fishing.....	1.7	4.2	75.7	5.8	1.4	11.2	100.0
B	Mining and Quarrying.....	1.7	0.9	86.6	2.3	4.3	4.2	100.0
C	Manufacturing.....	9.8	4.7	55.5	9.7	2.4	17.9	100.0
D, E	Electricity, Gas, Steam and Air Conditioning supply; Water supply; Sewerage, Waste Management and Remediation Activities.....	8.1	28.7	25.5	9.7	1.3	26.8	100.0
F	Construction.....	5.2	2.1	46.0	35.5	1.7	9.5	100.0
G, H, I	Wholesale and retail trade; repair of motor vehicles and motorcycles; Transportation and Storage; Accommodation and Food Service Activities.....	11.2	4.1	12.6	23.3	36.3	12.5	100.0
J	Information and Communication.....	42.0	5.6	12.7	15.6	6.2	17.8	100.0
K	Financial and Insurance Activities.....	48.9	3.3	6.4	19.8	3.0	18.6	100.0
L, M, N	Real Estate Activities; Professional, Scientific and Technical Activities; Administrative and Support Service Activities.....	11.7	5.8	11.4	51.6	10.4	8.9	100.0
O, ..., S	Other Industries.....	18.4	22.7	10.1	14.3	6.9	27.6	100.0
TOTAL	All industries.....	13.2	8.7	25.3	25.4	11.7	15.8	100.0

5.10.2.2 Structure and problems of the commodity flow method

5.264 An ideal commodity flow approach follows products from “cradle to grave” i.e. from their creation or their entry into the economic process until their final use, thus recording all the branches to various utilisation categories and tracing all the conceivable value-adding, finishing and conversion processes. Newly manufactured products, for example, may be exported immediately, or they may initially be put into storage by the producer, or else the producer may use or consume them; alternatively, they may be supplied direct to other domestic end users or consumers for production, investment or consumption purposes. They may also be sold first to a trader, who will then export, store or resell them. The same applies to imported goods.

Figure 5–7 shows the capital goods flows on which a commodity flow approach would be based under optimum statistical conditions.

5.265 In view of the constraints prevailing in the domain of statistics, it is impossible to show the flows in detail on the diagram, nor can their exact sequence as dictated by the direction of flow be represented. In fact, multiple summaries and estimates are required. Moreover, additions and other interventions cannot be made for the same breakdown of products at every single stage in the calculation. The calculation process is also influenced by the type of statistical material that is available on product prices for deflation purposes and its degree of detail.

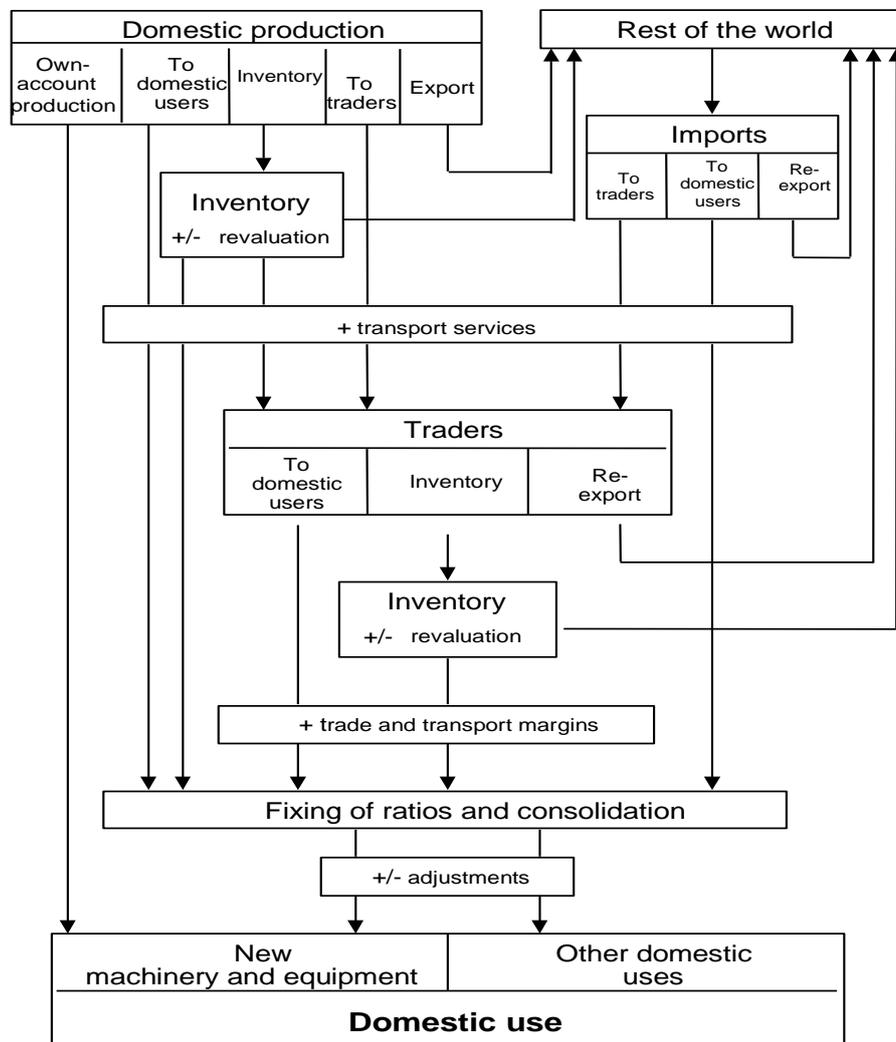
5.266 The most important model simplifications of German commodity flow accounting have been referred to above: one of these is the avoidance of separate examinations of the flow of commodities produced and used in Germany, the flow of exports and the flow of imports. This is done instead by means of a prior adjustment, whereby the net domestic supply (output - exports + imports) is derived at domestic basic prices. In addition, the capital formation ratio of the individual products is not fixed immediately prior to the final stage, when the product is about to pass to the end user, but at a very early juncture, immediately after the figure is netted. The combination of these two steps considerably reduces the required number of specific estimates. In particular, it obviates the need to estimate separate capital formation ratios for domestic output

and imports in respect of individual product categories; this is, however, at the expense of a reduction in the level of detail.

- 5.267 The commodity flow method also suffers from a degree of inaccuracy in the measurement of changes in inventories of machinery and equipment, since stock surveys in Germany are not sufficiently up-to-date, available on an infra-annual basis or even differentiated by commodity at all. In addition, the infra-annual output and turnover data that is used to estimate the value of changes in inventories of capital goods for the quarterly accounting does not permit any assessment of stock movements during trade, the activities of which cannot in general be shown as an institutional intermediate stage in the commodity flow account. Instead, trade and transport margins have to be estimated and added at a later point in the commodity flow for more consolidated product groups. By contrast, certain other adjustments are made at a fairly early stage in the commodity flow and are undertaken separately for production, exports and imports, although most of these adjustments are also made for highly aggregated groups of product categories.⁸⁴

⁸⁴ The actual commodity flow positions are explained later in section 5.10.2.3.

Figure 5–7: Commodity flow accounting of new capital formation in machinery and equipment (idealised measuring concept)



a) Statistical basis

- 5.268 The starting point of a commodity flow account is the total volume of new products that enter the economic process within a given period, i.e. the new products produced in Germany or imported from abroad.. Accordingly, the quarterly output statistics (EVAS 42131) and the monthly foreign trade statistics (EVAS 51141, 51231) form the foundation of the commodity flow account. From the perspective of the domestic use of income, exports should be subtracted from this volume, so that the domestic supply of goods (output – exports + imports) remains behind. This already raises a range of statistical problems, in particular categorisation and temporal classification issues, negative balances and the treatment of unallocated items in foreign trade and of entire production plants. Before describing the output and turnover statistics, we should first discuss their importance for the commodity flow method.
- 5.269 The flow of commodities starts with the production of goods, but in accordance with ESA 2010 paragraph 3.134 capital formation is recorded when the ownership of the fixed assets is transferred to the investor. This time only coincides with the time of

production in the case of own-account fixed capital formation; for purchased assets, the relevant time is the completion of the purchasing process. In this respect, the figures from the turnover statistics, which are dated according to the invoicing, should be closer to the target time and thus more suitable, especially as the production of capital goods destined for sale and the turnover of capital goods manufacturers categorised by specialisation should be very similar. In addition, the group of respondents is more or less the same. If turnover data were used in place of output data, it would therefore be possible to circumvent the estimation of manufacturers' stock movements. So in this specific respect, turnover values would actually be a more suitable basis for the national accounts purpose of measuring use-of-income aggregates. The commodity flow method is, however, reliant on data sources with a detailed subdivision by product in order to determine the domestic supply by balancing and to apply capital formation ratios to it – more on that later. Since turnover statistics are divided according to economic activity (and, moreover, only relatively roughly according to the four-digit classes of WZ 2008), they cannot substitute for output statistics.

5.270 Nonetheless, turnover data is indispensable in the commodity flow method to allow a quantitative assessment at two important transitional stages from the production-side view of the output statistics to the expenditure-side demarcation of investment in machinery and equipment, firstly the capital formation services which are missing from the output statistics and secondly the aforementioned stock movements of capital goods at their manufacturers. To this end, the divergences between output and turnover data are examined using time-series analysis:

- Divergences in the system of concepts

Market production, besides covering those saleable commodities intended for the market, also includes products intended for the manufacturer's own use, including own-account machinery and equipment and commodities intended for rental (manufacturer leasing). In both of these respects, market production is a broader concept than turnover, which is confined to actual sales and covers neither the value of machinery and equipment produced for the manufacturer's own use nor products intended for leasing.

The turnover of businesses from their own products and services, unlike output and contrary to the desired national-accounting definition, probably includes at least some of the receipts from the leasing of products manufactured by the businesses themselves. In accordance with the system of national accounts, however, the turnover from this activity contains the revenue from services which are largely omitted from the output figures. Examples are transport services, services provided in connection with the initial installation of new machinery or equipment and, in the case of complex production plants, planning services, in so far as these services are directly linked to the capital asset in the narrower sense.⁸⁵ Such additional services to investors are often included by manufacturers in the price of the purchase and reported as turnover. In contrast, other components of turnover should not be recorded as fixed capital formation but as intermediate consumption, e.g. maintenance and inspection, advertising and staff training. Moreover, there are demarcation differences between turnover and output data relating to

⁸⁵ See also the results of a survey in accordance with Section 7 of the Federal Statistics Act in Mödinger, P., Redling, B.: "Produktbegleitende Dienstleistungen im Industrie- und Dienstleistungssektor im Jahr 2002" (Product-related services in the industrial and service sectors in 2002), in WiSta 12/2004, p. 1408 ff. and Opfermann, R.: "Produktbegleitende Dienstleistungen und ihre statistische Erfassung" (Product-related services and their statistical reporting) in WiSta 3/2004, p. 269 ff.

production processes which involve a division of labour. For example, in certain forms of contract processing, besides the value of the finished products, the wage element that is already included in the latter is reported again as turnover; this element, however, does not appear separately in the output figures. It is apparent that it is impossible in practice to make an absolutely sharp statistical distinction between the capital and non-capital components of output and turnover. Ultimately, it may be assumed that the reported turnover figures fall short of the output figures and of the definition requirements for national accounts in some areas, especially in connection with own-account machinery and equipment and machinery and equipment intended for leasing purposes. Conversely, turnover figures can also exceed total reported market production, because the former include a number of ancillary services and other extras. Only some of these ancillary services are recordable as machinery and equipment under the national accounts rules. These include in particular planning, project development and other engineering services, transport services connected with the sale of capital goods, installation services (and other installation and commissioning services), as well as training and familiarisation on first installation. Examples of components of turnover which do not belong to the figures for machinery and equipment include income from the renting or leasing of products, regular maintenance, inspection and training services, hotlines, regular software licence fees, income from patents and licences, and advertising services. The trend component of the time-series for the ratio of output to turnover in the area of capital goods is interpreted in the German national accounts as a measure of the missing machinery and equipment components in the output statistics and forms the basis for corresponding allowances (see section 5.10.2.3(a) below).

- Temporary and random deviations:
The reporting time in the turnover statistics is, as mentioned above, more expedient for the calculations of machinery and equipment than that in the output statistics, because it includes stock movements at the manufacturer. Over time, however, increases and reductions in inventories balance each other out to a large extent, as do different invoicing and production progress dates in major long-term projects, which is why output and turnover differ only temporarily. The same applies to random (erratic) influences on both sets of statistics, which by definition have a long-term average and expected value of zero.
The combined seasonal and residual component of the time-series for the ratio of output to turnover in the area of capital goods is interpreted in the German national accounts as a measure of stock movements at the manufacturer and forms the basis for corresponding adjustments of the output statistics (see also section 5.10.2.3(a)).

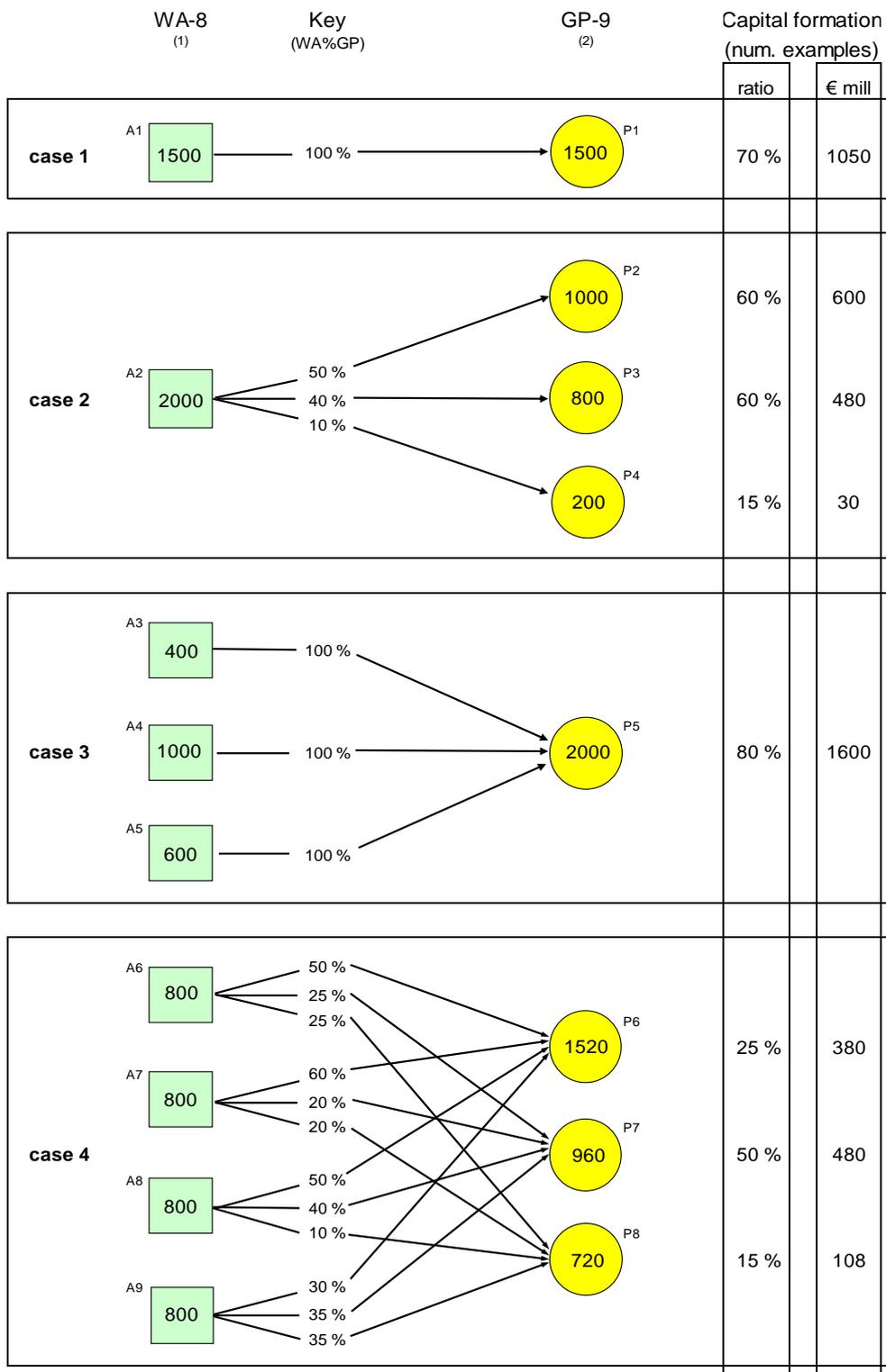
b) Allocation to classification categories

- 5.271 The domestic output data used in the commodity flow method is classified according to the German Systematic Classification of Commodities for Production Statistics, 2009 edition (GP 2009), while the data on imports and exports of goods is broken down in accordance with the annually updated German Commodity Classification for Foreign Trade Statistics (currently WA 2015). Although, in the course of the EU-wide implementation of unifying classifications in the 1990s, the two classification systems are now more harmonised with each other than before, the aggregation of output and foreign trade source statistics on domestic supply is still affected by unclear allocation issues, because there are no generally applicable unambiguous relationships between

the respective individual items in GP 2009 (differentiated down to a level of nine-digit categories) and WA 2015 (down to eight-digit categories) that would allow the demarcation of a specific GP item to correspond exactly to the definition of a WA item and vice versa. Since domestic supply is depicted in the calculation of machinery and equipment at the level of detail of nine-digit GP categories, an unambiguous 1:1 projection of all WA items to GP items would be sufficient, but this does not exist. Instead of this, the specialised statistics provide the national accounts with a qualitative classification key, which indicates for each eight-digit WA category the corresponding individual nine-digit GP category or corresponding multiple nine-digit GP categories, without in the second case specifying in what quantitative proportions the relevant WA item is to be allocated to the respective GP items. This is problematic if these GP items are associated with different capital formation ratios and/or allowances (see below), because in that case the actual conversion will have an impact on the resulting level of machinery and equipment. Figure 5-8 below illustrates this and, in addition to the non-critical allocation cases 1 and 3 (1:1 or n:1), shows problem cases 2 and 4 (1:n or n:n).

- 5.272 Among the approximately 9 500 eight-digit WA categories in 2010, the qualitative WA-GP reconciliation key identifies some 1 300 problematic 1:n or n:n allocations. Of these, only around 300 WA items are relevant to capital formation. For these items, quantitative keys must be estimated within the commodity flow account and revised on an annual basis. These WA-to-GP conversion keys must be adjusted in each case in accordance with the prescribed annual Europe-wide amendments to the Combined Customs Tariff and Statistical Nomenclature (CN). In 2010, around 14 000 sets of keys in total were required to convert the 9 500 WA items to approximately 5 700 nine-digit GP categories, including around 850 special keys for the allocation of complete industrial plant being exported, which will be discussed below.
- 5.273 In accordance with EU law, large systems with a value of more than EUR 3 m assembled from individual components may, by special permission of the Federal Statistical Office, be assigned a specific WA code and declared for export as “complete industrial plant” (WA Chapter 98). The assigned commodity code only specifies the system components at WA chapter level, i.e. quite roughly. Approximately 15 of these codes have been assigned, to which an export volume of EUR 3.9 bn was attributable in 2010. Offsetting such large two-digit WA categories with individually declared nine-digit GP categories in the output statistics would lead to implausible results, so that keys at a greater level of detail would have to be estimated. To reduce the effects of incorrect attributions, the WA items in question are widely spread across relevant GP items and, on average, allocated to approximately 40 nine-digit GP categories.

Figure 5–8: Cases of classification reconciliation



(1) 8-digit level in the German Commodity Classification for External-Trade Statistics
 (2) 9-digit level in the German Systematic Commodity Classification for Production Statistics

c) Temporal and substantive allocation

5.274 The results of a commodity flow account are only as good as the quality and level of detail of the underlying data. Hidden errors in the output and/or foreign trade statistics therefore adversely effect the commodity flow results, as do entries that, while correct in themselves, lead to errors in the commodity flow model. In this respect, mention may be made of three problem areas:

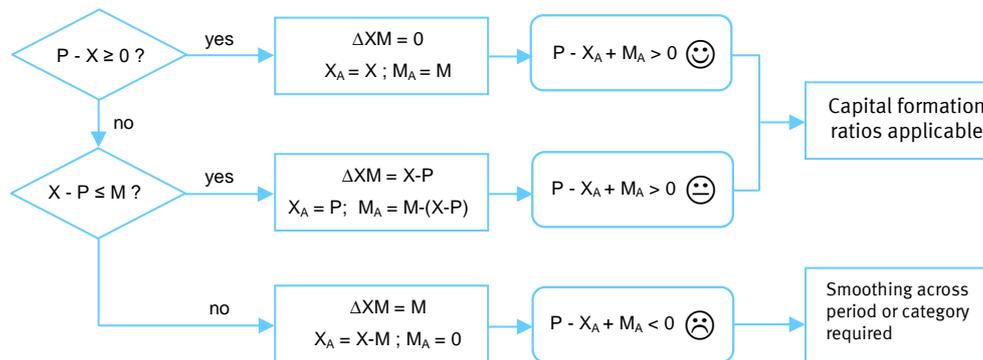
- Survey errors: goods may be misclassified by the respondents, output and commercial operations may be allocated to the wrong reporting period. In addition, some activities are not reported.
- Storage: exports measured in the reporting period may consist of output from earlier periods that has been in storage for more than one period and may be only inadequately covered by adjustments based on the turnover statistics (see above).
- Re-exported goods: an export of goods is not based on output of the same period if these goods had previously been imported.⁸⁶ In this case, they are not valued at basic costs, but at their earlier (usually higher) CIF transition values.

Such cases may result in the reported equipment levels being too low or too high in the relevant reporting quarters. In the case of re-exported goods, this may be accompanied by an exaggeration of the statistically recorded import share for machinery and equipment and, in the event of divergent index levels for domestic producer prices and for import prices, the overall deflator may become distorted. In the event of allocation to the incorrect period, the figures reported for the adjacent quarter will generally be a mirror image, either too high or too low. The aforesaid issues can be detected within the commodity flow account only in exceptional cases, e.g. if misclassifications and incorrect period allocations appear as characteristic outliers in the output data tables. The absence of infra-annual capital expenditure surveys means that there is also no investor-accounting mechanism for cross-checking the quarterly trade statistics on machinery and equipment that are significant for analysing the state of the economy. Apart from certain exceptions, balance formation on a commodity basis (output – exports; P-X) on the domestic supply derived from domestic output is therefore the only suitable method of indicating such problems, but it does not reveal the specific cause: if P-X is negative – i.e. exports exceed output – intervention is required.

5.275 A pragmatic adjustment which does not alter the overall balance is made to the commodity flow account to “treat the symptoms”. The accounting procedure applied meets the following criteria: it is practicable in terms of the required technical input, the national accounts experts consider that its net effect is to shift the substance of the accounting data in the right direction, it does not affect the nominal total value of GFCF in machinery and equipment, and it reduces implausibilities in the deflation process and thereby improves the temporal consistency of the figures for GFCF in machinery and equipment at prices corrected for inflation. Eventually exports and imports are reduced equally by a certain amount if the quarterly balance of output less imports for a product category at the lowest level of aggregation (nine-digit GP code) is a negative figure. The amount of the adjustment is determined by the following algorithm (figure 5–9):

⁸⁶ The following come into consideration as goods of foreign origin for the purposes of the external trade statistics: returned goods, exports after active processing to order or economic processing, exhibition and trade fair goods, storage goods on foreign account, loan and rental items after being used in Germany, deliveries in connection with Community programmes (e.g. Airbus Community programme) etc.

Figure 5–9: Representation of the adjustment procedure



P = Domestic production
 ΔXM = Adjustment deduction of X and M
 X, M = Export, import (initial data)
 X_A, M_A = Export, import after deduction

In general, the adjustment is made automatically; only in cases where the domestic supply of goods is negative ($P - X + M < 0$) do the figures need to be smoothed out separately. For 2010, applying the same absolute adjustment figure to exports and imports, this method lowers the value of exports by around 21 % and the value of imports by approximately 36 %, both figures prior to applying capital formation ratios. These deductions do not exhibit a significant seasonal figure over the course of time, but do show a downward trend since 2010. This adjustment also includes, for example, some exports and imports of products for further processing in the framework of the Airbus manufacturing consortium. The different percentage reductions for exports and imports reflects their differing weightings in the overall balance of domestic availability.

d) Capital formation ratios

5.276 Capital formation ratios (CFRs) determine the proportion of goods entering the domestic economic process for the first time that are ultimately used as investment (in machinery and equipment) within Germany, possibly after taking into account trade and transport services, non-deductible VAT and other additions. For the commodity flow accounting of machinery and equipment, capital formation ratios, highly broken down by type of goods, are the key model parameters. Goods can be divided into five categories, based on their characteristics and the way in which they are typically used:

- Type 1 The commodity is not fixed capital under any circumstances (CFR = 0 %); e.g. chocolate bar (consumption), reactor fuel rod (intermediate consumption).
- Type 2 The commodity is almost exclusively fixed capital ($95 \% < \text{CFR} \leq 100 \%$), e.g. bucket wheel excavator.
- Type 3 Depending on how it is the used, the commodity is either fixed capital or intermediate consumption ($0 \% < \text{CFR} \leq 100 \%$), e.g. jet engine: represents intermediate consumption when used in the construction of a new aircraft or fixed capital when fitted as part of a general overhaul designed to prolong the life of an aircraft.
- Type 4 Depending on how it is the used, the commodity is either fixed capital or final consumption ($0 \% < \text{CFR} \leq 100 \%$), e.g. personal computer.

- Type 5 Depending on how it is used, the commodity is fixed capital, intermediate consumption or final consumption ($0\% < CFR \leq 100\%$), e.g. electric hobs.

Irrespective of how it is actually used, the type allocation may also depend on the specifications of ESA: for instance, it is only since the introduction of ESA 1995 that military durables with civilian uses (e.g. field kitchens) have been recorded as fixed capital (prior to that they had been treated as intermediate consumption), and since the introduction of ESA 2010 military weapons systems, such as tracked armoured cars, have been considered to be fixed capital, while previously they had been included in (general government) consumption.

- 5.277 In an ideal commodity flow account, original estimates of the subsequent intended use of a product would be required at an early stage of its creation or import, specified on the basis of hard statistical data from surveys of producers and importers or from qualified expert reports. No such data, however, is available from either official or non-official sources. Instead, estimates must be made in the context of the national accounts and then regularly checked for plausibility and timeliness and, if necessary, supported by sporadic expert surveys and references to the literature. In this manner, capital formation ratios are defined within the framework of the commodity flow account in the most detailed possible product classification, i.e. nine-digit GP categories.
- 5.278 Of the approximately 5 700 nine-digit GP categories in total, nearly 4 000 product categories are attributed to type 1 ($CFR = 0\%$) to the result. Around 500 product codes are assigned to type 2, with ratios between 95 % and 100 %. In this respect, a CFR of slightly less than 100 % is often applied even to products that are in principle pure capital goods, such as automatic punching presses, because the trend towards increasing product complexity, e.g. in plant engineering and assembly line construction, means that individual machines and other components are included as intermediate products in such large-scale plants, which are themselves then recorded as capital goods. The allocation of types 1 and 2 may be regarded as relatively secure and plausible. The remaining approximately 1 200 commodity categories of types 3, 4 and 5 are affected by greater levels of uncertainty. In the table below, the approximately 1 750 nine-digit GP codes of types 2 to 5, which are assigned positive capital formation ratios in the German national accounts, are arranged according to the level of ratio.

Table 5–26: Ratio structure of the basic materials underlying capital expenditure on machinery and equipment

In EUR m

% -ratios	Number	Values before ratio				Values after ratio			
		Output (P0)	Exports (X0)	Imports (M0)	Balance (PXM0)	Output (P1)	Exports (X1)	Imports (M1)	Balance (PXM1)
> 0 - < 5	160	19384	14873	9027	13538	618	485	255	388
≥ 5 - < 10	229	43219	20533	16631	39317	2212	1060	872	2024
≥ 10 - < 20	303	71624	40688	28943	59878	8242	4884	3321	6679
≥ 20 - < 40	134	40822	25444	16208	31586	11498	7207	4892	9182
≥ 40 - < 60	105	163963	100610	31054	94407	83601	53012	15468	46057
≥ 60 - < 80	132	23072	15835	7319	14557	15656	10654	5014	10016
≥ 80 - < 90	91	21187	9850	8159	19495	17624	8161	6714	16177
≥ 90 - < 95	114	15815	9304	2698	9209	14503	8597	2469	8375
≥ 95 - = 100	494	107663	93228	43210	57646	104862	91276	42663	56249
Total	1762	506748	330366	163250	339633	258816	185337	81668	155147

Total = 100

% -ratios	Number	Structure before ratio				Structure after ratio			
		Output (P0)	Exports (X0)	Imports (M0)	Balance (PXM0)	Output (P1)	Exports (X1)	Imports (M1)	Balance (PXM1)
> 0 - < 5	9,1	3,8	4,5	5,5	4,0	0,2	0,3	0,3	0,3
≥ 5 - < 10	13,0	8,5	6,2	10,2	11,6	0,9	0,6	1,1	1,3
≥ 10 - < 20	17,2	14,1	12,3	17,7	17,6	3,2	2,6	4,1	4,3
≥ 20 - < 40	7,6	8,1	7,7	9,9	9,3	4,4	3,9	6,0	5,9
≥ 40 - < 60	6,0	32,4	30,5	19,0	27,8	32,3	28,6	18,9	29,7
≥ 60 - < 80	7,5	4,6	4,8	4,5	4,3	6,0	5,7	6,1	6,5
≥ 80 - < 90	5,2	4,2	3,0	5,0	5,7	6,8	4,4	8,2	10,4
≥ 90 - < 95	6,5	3,1	2,8	1,7	2,7	5,6	4,6	3,0	5,4
≥ 95 - 100	28,0	21,2	28,2	26,5	17,0	40,5	49,2	52,2	36,3
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

5.279 Most capital formation ratios remain largely constant over time. This is obvious for goods of types 1 and 2, but, given the high level of detail, it may be assumed that goods of types 3 to 5 also display relatively constant characteristics and usage patterns. In addition, although capital formation ratios that are erroneous, but stable over time, may result in the extrapolation of potentially incorrect equipment levels, the time series curve is nonetheless not parametrically distorted; the rates of change that are of primary interest for economic analysis tend to remain unaffected. However, in particularly dynamic product categories – especially in information and

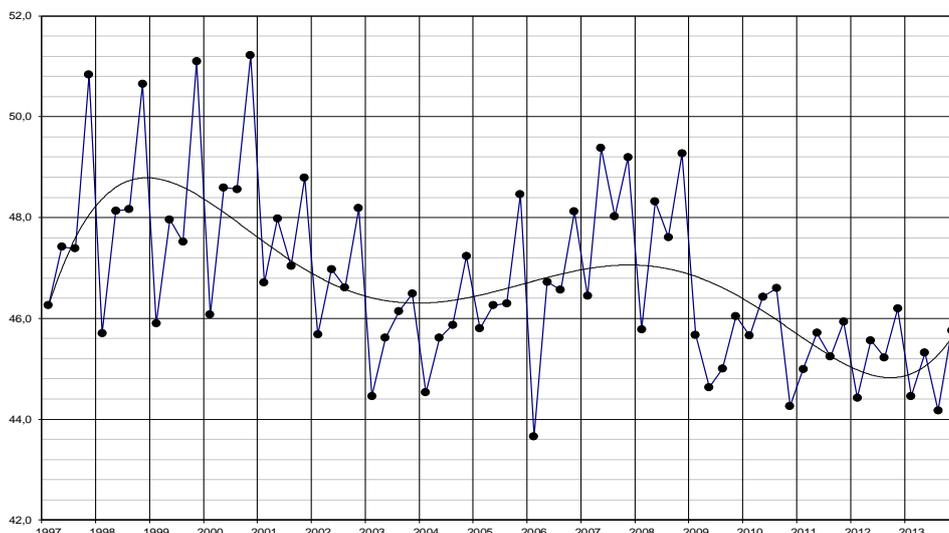
communication technology and electronic data processing – the ratios are not only checked frequently, but are also subject to substantial adjustments when required. For example, in the reporting period of the national accounts since German reunification, mobile phones and laptops have changed from being pure capital goods for special applications, often in the five-digit price range, to being ubiquitous everyday devices with a high consumption share. In response to this, massively reduced capital formation ratios have been applied for these products in the national accounts.

5.280 Cyclical and seasonal fluctuations in capital formation ratios are entirely conceivable, e.g. for type 4 goods such as notebooks, the consumption of which is likely to rise at Christmas time and maybe even during a recession. Using the available statistical instruments, however, these fluctuations are as difficult to detect as actual changes of ratio between components of not entirely homogeneously defined types of products at nine-digit GP category level. Nonetheless, the calculated cumulative CFR across all categories of capital goods displays a characteristic seasonal pattern and a cyclical trend.

5.281 Figure 5–1 shows the quarterly capital formation ratio for cumulative domestic availability (P-X+M) across all approximately 1 800 products with a positive CFR (in a level of detail down to nine-digit GP categories). The eye-catching shape of the curve is not caused by fluctuations in the elementary CFRs themselves, which remain largely constant. It is rather the result of structural effects between the categories of capital goods. The tendency for ratios to peak in the fourth quarter and to sink to their lowest level in the first quarter of the year thus shows that, within the total range of product categories that are used for capital formation, those products with a higher CFR tend to assume particular importance towards the end of the year and are accorded lowest priority at the start of the year. It is therefore clear that, with a relative constancy of all single ratios, the degree of classification of products will have a great effect on the level of economic and cyclical reality reflected in the figures for investment in machinery and equipment by the commodity flow account. From this viewpoint, for example, the reduction in the product categories recorded in output or foreign trade surveys, which repeatedly features in discussions regarding efforts to save the expense of the official statistics, would serve to lower the quality of the commodity flow accounting.

Diagram 5–1: Cumulative capital formation ratio

Cumulative figures for all GP numbers with ratios > 0



e) Calculation levels of the commodity flow method

5.282 The following Figure 5-10 illustrates the hierarchical structure of the aggregation and calculation levels of the commodity flow method.⁸⁷

- | | |
|--|--------------------------|
| 1. Base level, lowest possible product classification: | WA 8 digits, GP 9 digits |
| 2. Categorisation group 1, medium product aggregation: | GP 4 to 9 digits |
| 3. Categorisation group 2, high product aggregation: | GP 2 to 3 digits |
| 4. Global level, maximum aggregation: | GP 1 digit |

Level 1 (base level):

At level 1, only the foreign trade and output statistics are dealt with for the smallest product categories. This includes all the classification issues affecting CF, the encoding of the WA items to GP, the observation and any necessary corrections of balances and all setting of ratios at the level of the individual product. The actual valuation covers the monthly processing of import and export figures, which are recorded separately for trade with EU partners and trade with countries outside the EU, and the quarterly processing of output statistics. This valuation does not use the raw source data, comprising several million data sets, but is based instead on special starter material from the specialised statistical collections, material which serves other purposes too. At this level, the entire spectrum of products is handled rather than a selection thereof which is relevant to capital goods. This makes it easier to make comparisons and to perform cross-checks with other collection systems and establishes a link with global indicators through up-to-date estimates. At the present time, around 9 500 WA code numbers have to be processed; in 2010, with the aid of approximately 14 000 key files, these were transformed into around 5 700 GP codes, of which about 1 800 may consist wholly or partly of machinery or equipment that can be used for fixed capital formation. Since the major revision in 2005, data on prices taken in principle from the nine-digit GP classifications are included. However, in fact only around 600 producer price indices and about 500 import price indices are distinguished.

Level 2 (categorisation group 1):

Level 2 is characterised by a specially compiled set of products broken down into categories of medium size, referred to internally as “Categorisation Group 1” (Grp1). It is shown below in table 5–27. This set of product categories, currently 203 items, was designed to be homogeneous in its content and balanced in terms of its quantitative structure and is a mixture of four-digit to nine-digit GP codes. In the regular quarterly accounts, ESA requires a transition to be made as part of deflation from the fixed prices of base year 2010 in the statistical material on prices to a calculation using the previous year's prices at this medium level of product detail. Further important applications of Categorisation Group 1 occur in the internal GFCF cross-classification matrices described already and in various tasks in connection with the valuation of assets and of fixed capital consumption.

⁸⁷ The demarcation is shown primarily for information purposes, because in some cases the level transitions are fluid from a technical IT perspective.

Level 3 (categorisation group 2):

The nominal and price-adjusted intermediate results (P-X and M) of categorisation group 1 are aggregated at the level of “categorisation group 2” (Grp2), which is shown in table 5-28 below. Most new GFCF in machinery and equipment (approximately 75 % in reporting year 2010) are determined on the basis of this raw data from the source statistics. All additions and demarcation processes are then effected at the level of Categorisation Group 2, since the bulk of these transformations cannot be quantified for more specific product categories. This also explains why many analytical enquiries designed to elicit information about the most highly differentiate product classifications for GFCF in machinery and equipment are impossible to answer from the CF accounting system. The various stages in the accounting process at which data is added and transformed can be discerned in detail in what we call the “commodity flow dimension”. See Figure 5-11 and the explanation thereof in section 5.10.2.3.

Level 4 (global level):

As a global level, level 4 represents the overall figures for GFCF in machinery and equipment without further classification of products (“one-digit GP category”). This data and calculation level is used predominantly in the most up-to-date quarterly estimates of gross domestic product, since basic materials broken down into product categories are not yet completely available at this earlier point in time. Valuation level 4 has no relevance to more in-depth representations of the final annual results of GFCF in machinery and equipment. However, since levels 3 and 4 are entirely compatible with each other and since the data from each can be incorporated into the other, the final results from previous reference periods can also be presented and explained at valuation level 4. This is required in order to ensure compatibility between the valuation of machinery and equipment and the valuation of other aggregates, or indeed the GDP production approach, in the estimation of current values.

Figure 5–10: Data and valuation levels for commodity flow accounting of GFCF in machinery and equipment

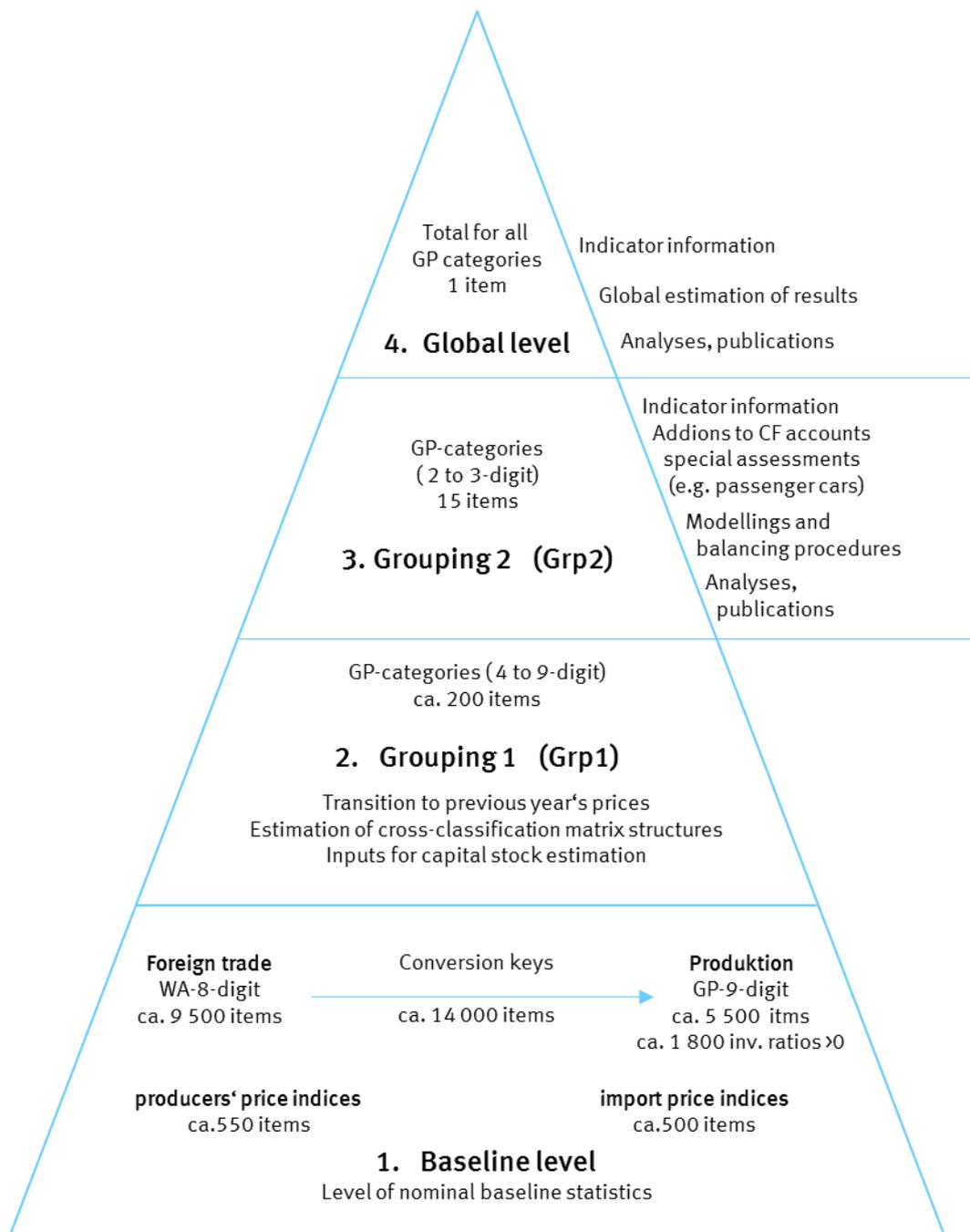


Table 5–27: Commodity Flow Categorisation Group 1 (Grp1)

Serial No	Grp1	Short text	Number GP-09
1	1392	Made-up textile articles, except apparel	28
2	1393	Carpets and rugs	6
3	1394 1 2	Made-up fishing nets and commodities	6
4	1400, 1500	Workwear and footwear	15
5	1623, 1624	Wooden containers	3
6	1629	Tools, handles etc. made of wood, products of wood	2
7	1820	Reproduction services of recorded media	8
8	2222	Fenders, tanks, drums, containers of plastic	9
9	2223	Collectors, tanks etc. > 300 l made of plastic	2
10	2313, 19, 41	Hollow glass, other glass, ceramics (or roof tiles, structural ceramics)	27
11	2320, 2344, 49	Ceramic goods and materials	11
12	2451, 52	Pipes, etc. of cast iron, iron/steel forged products	22
13	2511	Structural parts, sheets, rods, profiles of steel, aluminium	2
14	2529	Tanks, collectors and similar of iron, steel, aluminium	5
15	2530	Steam-generating nuclear reactors except central heating hot water boilers	9
16	2540	Weapons and ammunition	7
17	2571	Cutlery, razors, razor blades	7
18	2573	Tools for agriculture and forestry, joiners, bricklayers etc.	76
19	2573 5 0	Forging and moulding boxes for metal, glass, etc., models	9
20	2591	Iron or steel drums and boilers	4
21	2592	Containers, drums, jars of aluminium < 300l	1
22	2599	Manufacture of other fabricated metal products (household goods, ships' propellers)	31
23	2611 11	Electronic components and boards	3
24	2612 20	Sound, video and similar cards for automatic data processing machines	1
25	2620 11 - 15	Data processing machines, laptops, notebooks, systems, ATMs etc.	5
26	2620 16, 17, 18	Input or output units, such as printers, scanners, monitors etc.	5
27	2620 2,3,4	Other units, parts and accessories of computing machines, storage	3
28	2625 14, 27, 28	Watches and timepieces	7
29	2630 1, 2	Transmission apparatus incorporating reception apparatus Mobile phones	6
30	2630 23	Other telephone sets (telephones), transmission of images	5
31	2630 30, 40	Parts for telephony and telegraphy, aerials	6
32	2640 2	Consumer electronics	7
33	2640 31-33	Devices for image, sound recording and reproduction	3
34	2640 4	Microphones, loudspeakers, etc., receivers for radio communication	9

Serial No	Grp1	Short text	Number GP-09
35	2640 5	Parts for apparatus for image and sound recording, etc., antennas	3
36	2640 6	Video game consoles used with a television receiver etc.	1
37	2651 1	Navigation instruments and instruments for geophysical purposes, etc.	8
38	2651 2	Radiolocation, navigational and radio remote control devices	3
39	2651 3	High-accuracy weighing machines, drawing instruments, etc., instruments for measuring length	6
40	2651 4	Instruments for measuring or detecting ionising radiation, electrical values	11
41	2651 5	Instruments, etc. for measurement, etc. of other physical-chemical properties	24
42	2651 6	Other instruments, apparatus and devices for measuring and testing	28
43	2651 7, 8	Apparatus and devices for regulating, parts, accessories for measuring, testing, etc.	17
44	2660 1 1	X-ray equipment, devices, alpha emitters, etc. and related components	6
45	2660 1 2	Electro-diagnosis equipment, ultraviolet or infrared radiation apparatus	4
46	2670 1	Devices, photographic and cinematographic	14
47	2670 2	Other optical devices, lenses, mirrors, lasers, prisms etc	14
48	2711 1-3	Electromotors, generators, generator sets, electrical transformers	34
49	2711 4	Electrical transformers	11
50	2711 5	Power supply units, power converters, chargers	11
51	2712 1	Electrical devices for closing, etc. for >1000V	5
52	2712 2	Electrical devices for closing, etc. for ≤1000V	16
53	2712 3	Boards, fields, etc. for electrical switches, controls, etc.	6
54	2712 4	Parts of electricity distribution or control apparatus	3
55	2731 1 2	Fibre optic cables	1
56	2733 1 1	Wiring devices	8
57	2740 2	Lamps and lighting fittings, apart from for bicycles	17
58	2740 3	Headlights, lamps, lights	14
59	2751	Electrical household equipment and parts	35
60	2752	Non-electric heating and hot-water appliances, etc. for household, and parts	4
61	2790	Other electrical equipment, devices	18
62	2811	Combustion engines and turbines	23
63	2812 1, 2	Hydraulic and pneumatic components and systems, parts	13
64	2813 1	Pumps for liquids; liquid elevators	24
65	2813 2	Air, vacuum pumps, air or other gas compressors	14
66	2813 3	Parts of pumps and compressors	8
67	2814	Taps and valves	7
68	2815	Bearings, gears, gearing and drive elements	13

Serial No	Grp1	Short text	Number GP-09
69	2821 1	Ovens and furnace burners and parts thereof	14
70	2822 1 1	Pulley tackle and hoists other than skip hoists;	2
71	2822 1 2	Hoisting engines for mining, winches and capstans, etc.	3
72	2822 1 3	Fixed mechanical lifts for motor vehicles etc., winches	4
73	2822 1 4	Cranes, mobile lifting frames and works trucks fitted with a crane	7
74	2822 1 5	Electrical trucks, carts with or without lifting device	5
75	2822 1 6	Lifts, elevators and moving pavements	2
76	2822 1 7	Continuous mechanical handling equipment, roller conveyors	9
77	2822 1 8	Equipment for moving, loading/unloading railway vehicles, cable railways, etc.	5
78	2822 1 9	Parts of lifting equipment and conveyors	6
79	2822 2	Buckets, scoops, dipper ladles, claws for cranes and excavators	1
80	2823 1	Word processing and calculating machines, cash registers	4
81	2823 2	Photocopiers, blueprinting machines and other office equipment	8
82	2824 1, 2	Handheld machines and pneumatic tools, parts	25
83	2825 1 1	Heat exchangers and other apparatus for liquefying gas	5
84	2825 1 2	Air conditioning machines	4
85	2825 1 3	Refrigeration cabinets, equipment and devices for generating cooling, heat pumps	8
86	2825 1 4	Appliances for filtering or cleaning gases n.e.c.	7
87	2825 2	Ventilators or bench, wall fans and similar, output <=125W	3
88	2825 3	Parts for air-conditioning units, refrigerators, heat pumps and similar	11
89	2829 1	Generator gas products, etc.; equipment for filtering of liquids	9
90	2829 2 1	Packing machines	16
91	2829 2 2	Spray guns, sandblasting machine, water jet equipment, etc.	10
92	2829 3 9	Weighing and measuring equipment	8
93	2829 3 1, 3 2	HH personal weighing machines, filling and metering scales, etc.	3
94	2829 4 1	Centrifuges for chemical, food and other industries	3
95	2829 4 2	Calender and rolling mills (textiles, rubber, plastic)	1
96	2829 4 3	Automatic goods-vending machines (including cash dispensers)	2
97	2829 5	Industrial dishwashing machines	1
98	2829 6	Machinery and equipment for treating materials by manipulating temperatures n.e.c.	8
99	2829 7	Non-electrical welding and soldering machines, equipment and appliances	3
100	2829 8	Parts of other general-purpose machinery n.e.c.	16

Serial No	Grp1	Short text	Number GP-09
101	2830 1, 2	Single-axle, ploughing, forestry tractors and similar locomotives	7
102	2830 3 - 9	Ploughs, harrows, scarifiers, cultivators, seeders, planters and transplanters	61
103	2841 1	Machine tools for removing material, workshops, etc.	16
104	2841 21, 22	Screwing, drilling, routing and thread-cutting machines	15
105	2841 23, 24	Other machine tools for machining down metals n.e.c.	21
106	2841 3, 4	Machines for bending, folding and punching metal, parts	28
107	2849 1 1	Machine tools for stone, ceramic materials, concrete, etc.	3
108	2849 1 2	Woodworking machines, machine tools for cork, natural rubber and similar	12
109	2849 1 2 8	Machine tools for cork, natural rubber and similar	4
110	2849 21 - 24	Tool holders, special attachments for machine tools, parts	14
111	2891 1	Metallurgy, casting machines; metal-rolling mills	12
112	2892 2	Automatic graders, road graders, etc.	14
113	2892 3	Other machinery, etc. for earthmoving, grading, etc., clearing snow	5
114	2892 4, 5	Machines for sorting, screening, mixing and similar, crawler vehicle tractor	8
115	2892 6	Parts of mining, construction machinery and machines for handling building materials	9
116	2893	Machinery for food and tobacco processing, and parts thereof	31
117	2894 1	Machinery for spinning, weaving, embroidering and knitting	8
118	2894 2, 3	Other machines for producing textile clothing and handling skins, leather, etc.	23
119	2894 4	Domestic sewing machines	1
120	2894 5	Parts and accessories for textile, clothing and leather industry	13
121	2895	Machines for the paper industry	16
122	2896 1, 2	Machines and equipment for processing and working rubber, parts	17
123	2899 1 1	Bookbinding machinery and equipment	5
124	2899 1 2, 3	Typesetting machines, offset printers and equipment	5
125	2899 1 4	Other printing and auxiliary machines and equipment	4
126	2899 2 0	Machinery for the manufacture of wafers, semiconductors, flat panel displays	3
127	2899 3 1	Spin dryers, dryers for wood, paper, etc.	6
128	2899 3 9	Machines with independent functions n.e.c.	34
129	2899 4 0	Parts for bookbinding, typesetting and printing machines	3
130	2899 5	Parts for machines for other particular branches of industry n.e.c.	8
131	2910 1	Internal combustion engines of a kind used for motor vehicles	4
132	2910 2 1	Cars, mobile caravans with reciprocating engine with spark ignition, cubic capacity ≤1500cc	1

Serial No	Grp1	Short text	Number GP-09
133	2910 2 2 301	Cars with reciprocating engine with spark ignition with cubic capacity >1500-2500cc	1
134	2910 2 2 302	Cars with reciprocating engine with spark ignition with cubic capacity >2500cc	1
135	2910 2 3 100	Cars with internal combustion engine with self-ignition with cubic capacity <=1500 cc	1
136	2910 2 3 305	Cars with internal combustion engine with self-ignition with cubic capacity >1500-2000 cc	1
137	2910 2 3 400	Cars with internal combustion engine with self-ignition with cubic capacity >2000-2500 cc	1
138	2910 2 3 500	Cars with internal combustion engine with self-ignition with cubic capacity >2500 cc	1
139	2910 2 4	Cars with electric motors and other motors/engines	1
140	2910 2 Wohn	Motor caravans, all cubic capacities	4
141	2910 3	Buses with internal combustion engine, etc. with self-ignition or spark ignition	1
142	2910 4 1	Lorries with internal combustion engine with self-ignition	3
143	2910 4 2	Lorries with internal combustion engine with spark ignition or other engine	1
144	2910 4 3	Road tractors, without powered trailers	1
145	2910 4 4	Chassis for tractors, buses, cars, trucks with engines	1
146	2910 5	Rocker dump car, crane lorry, motor vehicle for special purposes	5
147	2920 1	Bodywork for cars, lorries, buses, tanker superstructures, etc.	5
148	2920 2 1	Goods container for gas, etc., containers, waste tips	3
149	2920 2 2	Towed caravan for living or camping	4
150	2920 2 3	Trailers (including semi-trailers)	8
151	2920 3 4 5	Parts for trailers, reconditioning, assembly, fitting out, including caravans and mobile homes	7
152	2932 3 0	Parts and accessories for motor vehicles and motor vehicle engines	3
153	2999 9 9	Refining of products in division 29	1
154	3011	Ships excluding boats and yachts	24
155	3012	Pleasure and sporting boats	4
156	3020	Rail-transport equipment	12
157	3030	Air- and space-transport equipment	19
158	3091 1, 3	Motorcycles, motorcycle engines	5
159	3092 1	Bicycles, parts and accessories	5
160	3092 2	Invalid vehicles	2
161	3099	Motor vehicles n.e.c., handheld carts, wheelbarrows	4
162	3100 1 1	Seat for aircraft and road vehicles, seating with metal frame	6
163	3100 1 2, 3	Seating mainly with wooden frames, garden furniture	9
164	3101 1 1	Seating mostly of metal	7
165	3101 1 2, 1 3	Seating of wood, cane, wicker, bamboo etc.	8

Serial No	Grp1	Short text	Number GP-09
166	3102	Wooden furniture for kitchens	2
167	3103	Mattresses, bedsteads	6
168	3109 1 1	Metal furniture n.e.c., schools, laboratories, excluding offices	6
169	3109 1 2	Wooden furniture for bedrooms, dining rooms and living rooms	9
170	3109 1 3, 4	Wooden furniture for offices, schools, laboratories, tool cabinets	10
171	3212	Cutlery, tableware of silver, precious metal	4
172	3220	Musical instruments	17
173	3230	Sports equipment	11
174	3240	Automatic bowling, billiards, mechanically operated games	8
175	3250 1 1	Other instruments, apparatus and devices for dentistry	3
176	3250 1 2	Sterilising equipment for medical or surgical purposes or laboratories	1
177	3250 1 3	Syringes, needles, catheter equipment for medical and surgical applications	12
178	3250 2 1, 2, 3	Massage equipment, respiratory therapy, prosthetics etc	5
179	3250 3 0	Furniture for medical, surgical purposes, barbers' chairs and similar components	2
180	3299 1 6	Slate boards, blackboards, framed	1
181	3299 5 9	Respiratory equipment, globes excluding relief globes	2
182	3311	Repair and maintenance of metal products	4
183	3312 1 1, 4	Repair and maintenance of combustion engines, turbines, pumps, bearings, ovens	3
184	3312 1 5	Repair and maintenance of lifting and handling equipment for mining and construction	3
185	3312 1 6, 7 8	Repair and maintenance of office equipment, excluding computers	4
186	3312 1 9	Repair and maintenance of machinery not elsewhere classified	5
187	3312 2 1 - 2 9	Repair and maintenance of machinery for other specified sectors	22
188	3313	Installation, repairs and maintenance of electrical and optical devices	5
189	3314	Installation, repairs and maintenance of electrical equipment	5
190	3315	Installation, repairs and maintenance of ships and boats	2
191	3316	Installation, repairs and maintenance of aircraft and spacecraft, jet engines	1
192	3317	Installation, repairs and maintenance of motor vehicles n.e.c.	1
193	3320 1	Installation of fabricated metal products	2
194	3320 2 1	Installation of office and accounting machinery	1
195	3320 2 9	Installation of other general-purpose machinery	17
196	3320 3 1	Installation of industrial machinery and equipment for agriculture	1

Serial No	Grp1	Short text	Number GP-09
197	3320 3 2	Installation of metal forming machinery	3
198	3320 3 3, 4	Installation of industrial machinery and equipment for metallurgy and mining	4
199	3320 3 5	Installation of industrial machinery and equipment for food, beverages and tobacco processing	1
200	3320 3 6, 7	Installation of industrial machinery and equipment for textiles, apparel, leather prod., paper prod.	3
201	3320 3 8, 9	Installation of machinery for plastics, printing, chemicals etc.	8
202	3320 4	Installation of electronic and optical devices	7
203	3320 5, 6	Installation of electrical equipment n.e.c.	5

Table 5–28: Commodity Flow Grouping 2 (Group 2)

Serial No	CPA No	Short text	Number GP-09
1	25	Fabricated metal products	151
2	26	Computer, electronic and optical products	199
3	27	Electrical equipment	183
4	28	Machinery and equipment not elsewhere classified	721
5	29.10.2	Passenger cars	12
6	29.10.3 - 5	Commercial vehicles	12
7	29 n.e.c.	Rest of CPA 29	35
8	30.1	Ships	28
9	30.2	Rail-transport equipment	12
10	30.3	Air- and space-transport equipment	19
11	30 n.e.c.	Rest of CPA 30	16
12	31	Furniture	63
13	32	Other manufactured goods	66
14	33	Repair and maintenance of machinery and equipment (including servicing)	107
15	Part of 13-16, 18, 22-24	Other manufactured products	139

5.10.2.3 Process and working steps of the commodity flow method

- 5.283 The precise process of the commodity flow method specified in the German national accounts for the determination of GFCF in machinery and equipment is shown in Figure 5–11 as the “Commodity flow dimension”.⁸⁸ These can be summarised as follows: The data in the output statistics are first adjusted according to their ratio to the relevant turnover data, weighted with capital formation ratios (nos 1-4) and then extrapolated and supplemented (nos 5-14). The quoted exports of machinery and equipment are also supplemented and re-valued with trade and transport services (nos 15-25), and then netted with domestic output (no 26-28). An analogous procedure is used for the import data (nos 29-39). In the next stage, the domestic supply of capital goods is formed and converted, by the inclusion of numerous additions and deductions, in accordance with ESA into the raw results for new machinery and equipment (nos 40-53). This intermediate state is supplemented by the special assessments for passenger cars and military weapons systems and reconciled, resulting in the new investment in machinery and equipment at current prices (nos 54-59). All the adjustments required to take account of inflows and outflows of used items of machinery and equipment are now made, which leads to the final figures for all GFCF in machinery and equipment (including military weapons systems) (nos 60-68).
- 5.284 The following subsection discusses important working steps (“commodity flow items”) of the commodity flow method, divided thematically. Before these descriptions, the more technical commodity flow items, or those which do not require explanation, should be mentioned together:
- Baseline values (serial nos.1, 3, 5, 15 and 29) These are the baseline output and foreign trade statistics, aggregated into two-digit or one-digit GP categories, which result from the valuations undertaken at levels 1 and 2, as described above. The comparative value UG (aggregate turnover in capital goods) also belongs to this group.
 - Results (serial nos. 2, 4, 13, 14, 24-28, 39-41, 52, 53, 55, 58, 59, 67 and 68): These are totals, differences and ratios that are derived by calculation from the upstream operations.
 - Reconciliation entries (serial no 56, 66): These are mostly temporary and low-value adjustments for various purposes, in particular for the elimination of rounding differences.

⁸⁸ Two notes to aid in understanding of overview 5–11:

1. The omitted serial numbers are for unused or lapsed commodity flow items, which will continue to be included in the process outline for reasons of consistency.
2. The suffixes attached in the overview to all the short texts for the output (P), export (X) and import (M) values indicate their processing status: The figure **0** signifies classification prior to the application of capital formation ratios and prior to any additions to the baseline data. The figure **1** shows that the classification of baseline values has been effected after the application of capital formation ratios but prior to alteration by means of the additions described below at valuation level 3 or 4, as appropriate. The figure **2** indicates that the baseline values have been classified after the application of the ratio and after the inclusion of all types of additions. Finally, the figure **3** denotes that, in addition to the application of ratios and supplements, the values have been reconciled and thus represent figures consistent with national accounting requirements.

Figure 5–11: Commodity flow dimension of investment in machinery and equipment

Ser. No	CF item Abbrev. 8	Inv-Sign	Item of the Commodity Flow Account Long text	2010 Mill. EUR
1	UG		Aggregate turnover (dom.+ext.) acc. to MB, NACE/GP 2 digit categories 25-33	697 016
2	QPO0UG		Ratio: output P00 / aggregate turnover 'UG'	99.4
3	P00		Output acc. to quarterly output stats., 20 or more employees, complete GP two-digit categories 25-33, before ratio	692 985
4	QP1P00		Ratio: Output P1 / output P00, i.e. incl. extrapolation GP 13-16,18, 22-24	37.3
5	P1	+	Machinery and equipment output acc. to quarterly output stats., 20 or more employees, GP 25-33, 13-16,18,22-24, after ratio	258 818
6	Hoch19	+	Extrapolated figures for 1-19 employees, analogy to extrapolations of turnover in production approach	7 992
7	Selbst	+	Own-account machinery and equipment	1 732
8	DIHrs	+	Estimate of capital goods services of capital goods producers (excl. Hsp, Trsp, software)	4 282
9	VoHrs	-/+	Estimate derived from P0/UG of seasonal stock components, incl. residual components	-1 773
13	SMErgP		Sum of all additions to quarterly output stats.....	12 233
14	P2		Output of machinery and equipment, after ratio, after supplements	271 051
15	A1	-	Exports of machinery and equipment, new products as far as ascertained from ext.-trade stats., after ratio.....	185 335
16	SoAH-A	-	Ext.-trade stats. supplements to exports (part of Ch. 99): Exemptions, e.g. missing responses, Federal Government goods, incomplete reporting	3 999
17	TrspA	+	Transport and trade services up to the border, if included in border crossing value	-7 416
18	IntraA+	-	Supplementary estimates for exports on account of under-reported intra-Community trade flows (1993-96)	
21	GebrKorrA	+	Used equipment included in exports without separate WA No (e.g. ships), part of serial no 60, demarcation of new goods	-515
24	SMErgA		Total of all supplements to exports	-3 932
25	A2		Exports of machinery and equipment, after ratio, after supplements	181 403
26	PA1		Balance (output - exports), after ratio, before supplements	73 483
27	SMErgPA		Total of all supplements to the balance (P1-X1)	16 165
28	PA2		Balance (output - exports), after ratio, after supplements.....	89 648
29	E1	+	Imports of machinery and equipment, new products as far as ascertained from ext.-trade stats., after ratio.....	81 666
30	SoAH-E	+	Ext.-trade stats. supplements to imports (part of Ch. 99): Exemptions, e.g. missing responses, Federal Government goods, incomplete reporting	2 763
31	Zoll	+	Excise revenue in EU foreign trade (EU external borders)	637
32	IntraE+	+	Supplementary estimates for imports on account of under-reported intra-Community trade flows (1993-96)	0
39	E2		Imports of machinery and equipment, after ratio, after supplements.....	85 066
40	PAE1		Balance (output-exports+imports), after ratio, before supplements.....	155 149
41	PAE2		Balance (output-exports+imports), after ratio, after supplements.....	174 714
42	VoHdl	-/+	Changes in inventories of capital goods in trade (currently assumed to be included in item 9 "VoHrs")	0
43	DIpAE	+	Estimate of capital-goods services, not of capital goods producers (excl. Hsp, Trsp, software)	2 627
44	PrNutz	-	Private use of capital goods (currently only cars), reclassification to household consumption.	-17 069
46	PrivLeas	+	Private car leasing (adjustment item for keeper definition in Federal Motor Transport Authority registration stats.)	4 109
49	Hsp	+	Trade-related services for machinery and equipment, all marketing stages	14 594
50	Trsp	+	Transport-related services for machinery and equipment from producer/border exit or entry to end user	3 869
51	GSt	+	Non-deductible taxes on products affecting mach. + equip.	4 851
52	SMErgPAE		Total of all supplements to the balance (P2-X2+M2).....	12 981
53	Neue1		Investment in new machinery and equipment, demarcation 1, before car registration comparison, before balancing	187 695

54	AbglN	+/-	Reconciliation between the commodity flow account for passenger cars and the special assessment for passenger cars, incl. military weapons systems	3 685
55	Neue2 (So)		Investment in new machinery and equipment, demarcation 2, after car registration comparison, after reconciliation	191 380
56	AbsN_1St	+/-	Internal CF balancing + GNP balancing (nominal) where appropriate, including rounding, distributed prop. to all two-digit GP categories	0
58	SMAbs		Total of all reconciliation steps with new machinery and equipment	0
59	Neue3		Investment in new machinery and equipment, demarcation 3, after car registration comparison, after balancing	191 380
60	GebrA	-	Exports of used equipment, where separately recordable in ext. trade stats (otherwise contained in X1)	-4 703
61	GebrE	+	Imports of used equipment, where separately recordable in ext. trade stats (otherwise contained in M1)	577
62	GebrPriv	-	Net sales of used machinery and equipment by investors to households (sector S14)	-6 952
63	Schrott	-	Scrapping of machinery and equipment not fully written off	-1 464
64	GebrLeas	-	Sales of used, leased cars to households (counterentry to PrivLeas)	-2 886
65	Gebr mWS	+/-	Sales of used military weapons systems to foreign countries	-43
66	AbsGebr	+/-	Punctual, structural (total-neutral) reconciliation of used machinery and equipment	0
67	SMGebr		Total net sales of used machinery and equipment	-15 471
68	Ausr		Investment in machinery and equipment (synonym: machinery and equipment) .	175 909

a) Adjustments to baselinesource statistics

Extrapolations for businesses with 1 to 19 employees (serial no 6)

5.285 Output statistics are only reported by enterprises with 20 or more employees. For this reason, at calculation level 3, i.e. at the level of categorisation group 2, extrapolation factors are introduced which are geared to the corresponding supplementary estimates in connection with the production approach for the domestic product. Up to reporting year 2000, the source data was derived from the former annual surveys of small businesses as well as reports submitted by craft and trade businesses; from 2001 onwards, it was derived from the structure surveys of businesses with 1-19 employees. In the calculations of machinery and equipment, the subdivisions of the extrapolation factors for manufacturing (WZ/NACE 25-33) can be used directly, but not their amounts: Since it must be assumed – there are no statistical sources here – that special capital goods manufacturers are under-represented among small businesses, the general extrapolation factors from the production approach are reduced by around half, so that the resulting additional estimates of GFCF in machinery and equipment amounts to nearly 3 % of output value P1.

Own-account machinery and equipment (serial no 7):

5.286 Own-account fixed capital formation, including an imputed profit margin, is assessed for the manufacturing sector in the framework of the production approach by means of the annual company and cost-structure surveys. In the domain of manufacturing, these sources shed no light on the division between fixed capital formation for producers' own use in machinery and equipment on the one hand and fixed capital formation in buildings and structures on the other hand. This distinction is actually made in the framework of the valuation of GFCF in buildings and structures. For the construction industry separate data are available on machinery and equipment produced by building firms for their own final use. Further indications are provided by the business reports of the largest German railway and telecommunications companies, Deutsche Bahn and Deutsche Telekom. According to the public finance statistics, it is estimated that 10 % of government expenditure on own-account fixed capital formation is devoted to fixed capital formation in machinery and equipment, the remainder being

allocated to construction projects. These figures in the classification by industries are then converted to categorisation group 1 and rendered suitable for the commodity flow account using GFCF cross-classification matrices. For parts of the manufacturing sector, under the classification system for output statistics, the commodity flow value P1 should already include own-account machinery and equipment. However, because of imputed undercoverage, particularly in the case of own-account fixed capital formation in the form of machinery and equipment which does not belong to the range of products normally marketed by the manufacturer, no deductions are made from the results of investor accounting.

Capital formation services of manufacturers of capital goods and others (serial nos 8, 43); changes in inventories at manufacturers of capital goods (serial no 9):

- 5.287 The need for these supplementary items has already been explained above (see section 5.10.2.2.(a)): The choice of output as the basis of the CF account requires the addition of capital formation services and services incidental thereto, the value of which, although included in the turnover of the capital goods manufacturers, is absent from production reporting. Capital-goods services are also provided by service companies - in other words, by actors in areas of activity outside the main focus of capital goods. The output stock changes of the capital goods manufacturers also have to be taken into account. A quantitative estimation of all three additional accounting items is made by reference to the monthly turnover statistics in the capital-goods manufacturing industry (WZ 25-33) and the corresponding key figures of the quarterly output statistics (GP 25-33). The value of changes in output stocks (serial no 9) held by capital-goods manufacturers is derived directly from the difference between the original output/turnover ratio and the seasonally adjusted output/turnover series; this is done by applying the difference in ratio to the original figure for turnover and deflating it to investment level with the help of the average capital formation ratio. This approach automatically reduces the effects of the stock item on the annual totals and requires only occasional manual interventions to check the plausibility of the results, which should also not affect the annual figures. The two capital-formation service items are estimated by first deriving a unit of measurement from seasonally-adjusted turnover and output figures which ultimately equals the difference, adjusted to allow for inventories and irregular components, between the figures for turnover and output and to which capital-formation ratios are also applied. The final amount of imputed services is derived as an estimated percentage for the actual capital formation portion of the P/T difference. In 2010, 26 % was adopted for the capital formation services of manufacturers of capital goods (serial no 8) and 15 % for that of the others (serial no 43).⁸⁹

Other exports and imports as per foreign trade statistics (serial nos.16 and 30); Additional estimates for intra-Community trade for 1993-1996 (serial nos.18 and 32):

- 5.288 The concept of other exports and imports covers reports, estimates and additions that are bracketed together in Chapter 99 "Compilations of various goods; special movements of goods" of the German foreign trade statistics. Not all are listed in the published WA. Among the official WA items which are regarded as being relevant to fixed capital formation are, for example, sets of parts for vehicle assembly, ranges of spare parts and aircraft parts. When such products are exported, it is assumed that an equivalent output value has been included in the accounts, which means that the corresponding (low) capital formation ratio from the output side must be applied to the

⁸⁹ In the absence of more recent sources, the calculation is based on findings in Mödinger, P., Redling, B.: "Produktbegleitende Dienstleistungen im Industrie- und Dienstleistungssektor im Jahr 2002" (Product-related services in the industrial and service sectors in 2002), in WiSta 12/2004, p. 1408 ff.

export figures to avoid over-reporting. Comparable imported goods are treated in an analogous manner. Among the non-published items in the WA classification that are included in the commodity flow account are the following entries, which are formulated in somewhat unspecific terms: 'Federal Government goods and services' (mostly imports), 'incompletely reported commodities' (mostly exports), 'missing responses on intra-Community trade' (estimated in the foreign trade statistics on the basis of tax returns) and 'exemptions in foreign trade statistics' (estimated and added to balance the reporting thresholds). None of these values is broken down sufficiently into good categories, so the estimated investment-related part is divided according to the structure of categorisation group 2 and inserted into the account with backward-projected average ratios for the various product categories

In addition, in the context of the commodity flow account of GFCF in machinery and equipment, additional temporary allowances were applied to exports and imports from 1993 to 1996 to cover under-reporting in the – at that time – still uncertain intra-Community trade statistics, which appeared plausible on account of differences in EU levels.⁹⁰

Trade and transport costs relating to fob exports (serial no 17):

- 5.289 In the balance of output less exports (P-X), output figures at ex-works prices are reduced by the value of exports, which, in accordance with the free-on-board (fob) principle, may normally include the cost of freight and insurance up to the point of entry into the country of destination as well as trade margins. For uniform evaluation ex-works, an across-the-board deduction is made at the breakdown level of Categorisation Group 2; in 2010, this deduction amounted to an average of 4 % of the value of exports.

Customs revenues from extra-Community trade (serial no 31):

- 5.290 The cif (cost, insurance and freight) value of extra-Community trade imports on entry into the EU does not include customs revenue, although this has to be included in the system of national accounts. Until 1993, as part of the foreign trade statistics, customs revenue statistics were available in the WA classification as a source of information. These structures have since been extrapolated to the level of categorisation group 2. They are used for allocation of a customs revenue allowance, the relative size of which is derived from the ratio between the customs revenues reported in the monthly reports of the Deutsche Bundesbank and the total import values.

Adjustment of export figures to isolate the value of new machinery and equipment (serial no 21)

- 5.291 In addition to the overall level of investment in machinery and equipment (serial no 68), the commodity flow account should also correctly display the amount and breakdown by goods of new machinery and equipment (serial no 59). Therefore, only exports of new products may initially be deducted from the total value of newly manufactured machinery and equipment. For the small number of goods, such as passenger cars, for which the WA provides separate registration numbers for new or used units, the used units are omitted from value A1 (serial no 15) and subtracted as exports of used machinery and equipment (serial no 60; see below). Other large exports, e.g. used ships and aircraft, cannot however be directly isolated. Nevertheless, the foreign trade statistics, include a separate estimate for used ships, which is incorporated as part of the adjustment described here (serial no 21).

⁹⁰ While these allowances do not affect reporting year 2010, they are listed here because of their relevance for parts of the time series 1991-2014.

b) Supplements to the valuation in accordance with the national accounts

The following supplementary items cannot be unambiguously allocated to the output, export or import of capital goods and are therefore implemented on the basis of the balance P2-E2+M2 (serial no 41).

Trade and transport services (serial nos 49, 50):

- 5.292 In contrast to the ideal version of a commodity flow account with its various trade and transport episodes (see Figure 5–7), on account of a lack of statistical sources only two summary estimated allowance factors, at the level of categorisation group 2, are implemented in the actual model calculation. These are based on extrapolated results from the input-output account which incorporated, among other things, information from the wholesale, retail and hospitality trade census and the wholesale and retail trade statistics. The allowance rates used are reviewed on the basis of the input-output account. To update these and other auxiliary statistical values, a new edition of the market integration chart is being contemplated as part of the input-output account.

Non-deductible taxes on products (serial no 51)

- 5.293 Non-deductible taxes on products are, like own-account machinery and equipment (serial no 7), determined using the investor account, initially by industry. Accordingly, businesses in the realms of communication (until 1995), financial intermediation and insurance, real estate and housing services, as well as some of the service industries (NACE 73 to 92), are ineligible for deduction of input tax. However, in some cases the current VAT rules specify exemptions. In the realm of other services, only a small number of activities are liable for VAT. The amounts of tax derived from the investor account, broken down into investing industries, are recoded to the product classification of Categorisation Group 2 with the help of GFCF cross-classification matrices.

c) Passenger car calculations

- 5.294 Until the major revision of the national accounts in 2000, capital formation in passenger cars was determined using the commodity flow method in the same way as the other machinery and equipment. The statistics of the Federal Motor Transport Authority were only evaluated for the assessment of the passenger car capital formation ratios. However, as a result of the significantly better data available on passenger cars in comparison with other machinery and equipment and their weighty proportion of total machinery and equipment, since that time a qualitatively superior special procedure has been applied that directly accesses numbers, unit prices and keeper groups and integrates the calculation of household passenger car consumption, thereby reducing the need for estimates and avoiding any inconsistencies.⁹¹
- 5.295 In accordance with the so-called M1 demarcation of the Federal Motor Transport Authority and the EU, passenger cars are defined as all vehicles used for passenger transport with at least 4 wheels and a maximum of 9 seats, which thus includes saloon cars, estate cars, off-road vehicles including SUVs, and motor caravans. The Federal Motor Transport Authority supplies the quarterly new registration data for these vehicles as a special assessment, divided by keeper group, which is tailored to the national accounts demarcation of economic activities and households. This makes it

⁹¹ Since, in contrast, commercial vehicles are virtually pure capital goods with heterogeneous and statistically non-recordable individual prices, their – considerable – contribution to investment in machinery and equipment will continue to be determined exclusively using the commodity flow method.

possible, in principle, to identify the cars that have been registered commercially and therefore purchased as capital formation. Their numbers are multiplied, after consulting the national accounts consumption account, by a quarterly average price for commercial cars, calculated by Deutsche Automobil Treuhand (DAT) on behalf of the Federal Statistical Office. The DAT provides an analogous price for new registrations by households, so that the consumption proportion of new passenger car registrations can be assessed. In addition to new passenger car registrations, the Federal Motor Transport Authority compiles an analogous special assessment on re-registrations, from which the sales of used cars by commercial to non-commercial keepers can be derived and, after being priced into the national accounts expenditure approach, can be recorded in a manner that reduces capital formation and increases consumption. This simple procedure is, however, beset by two problems: the private use of company cars and the registered keeper approach of the Federal Motor Transport Authority – and, associated with this, the leasing of cars by households.

Private use of company vehicles (serial no 44)

- 5.296 Many commercial keepers in almost all economic activities use company cars for private purposes, in some cases to a considerable extent. In fiscal legislation, this results in corresponding deductions from depreciation allowances for wear and tear and reduced rates of input-tax relief for the routine maintenance. From the perspective of the national accounts, the private use of commercially purchased assets that have been recorded as capital formation leads to the actual investment activity, i.e. the productive use of the goods, being overstated. In the German calculation of machinery and equipment, a proportion for private use is only recorded in the area of passenger cars. In accordance with ESA 2010 paragraph 3.124 in conjunction with paragraph 3.130(c), this private use of passenger cars is modelled by economic activity and reclassified in an abbreviated procedure from investment in machinery and equipment to household final consumption expenditure. There are no reliable statistical sources for the private use percentages; the ratios applied in the national accounts were therefore based on occasional press information, tax data and expert opinions. For economic activities with a dominant general government proportion, private use is excluded; a figure of 10 % is generally estimated for service sectors and 15 % for manufacturing and primary production. In a few selected areas, e.g. hotels and restaurants, ratios as high as 25 % are used.

The NACE/WZ division 45 “Motor vehicles” represents a special case; its passenger car registrations – which make up around one-third of all new commercial registrations – is currently assigned a private use percentage of 84 %. These relate predominantly to demonstration vehicles that are registered by the motor trade in their own name for a short period that is irrelevant to investment and then subsequently sold to households. In the German national accounts, a percentage of the value of the demonstration models is formally added direct to household final consumption expenditure. This is done for two reasons: firstly, demonstration vehicles are used from the outset for private purposes to a considerable extent in any case, regardless of any short-term allocation to trade; secondly, if they were assigned for the interim period to trade, the motor vehicle proportion in new machinery and equipment (serial no. 53 or 55) would be incorrect, because it would be inflated by a consumption element, and the resale of the vehicles would then result in an equally inflated volume of net sales to households of used machinery and equipment (serial no. 62; see below). The selected method thus ignores demonstration vehicles in their role as a transitory item in trade; proportional distortions are avoided by accepting possible blurring of the dividing line between fixed capital formation and household final consumption in contiguous periods, distorting the true picture by the amount of the balance between vehicle retailers' in- and outflows.

Private car leasing (serial no 46); Sales of used leased cars (serial no 64):

5.297 On account of the insufficient transfer of risk, leasing transactions are consistently interpreted in the German national accounts as so-called “operating leasing”, i.e. as a variant of car rental and not as financial leasing, i.e. as a specific sales transaction. Leased items are thus fixed capital formation by the lessor in order to earn rental fees. However, the Federal Motor Transport Authority allocates vehicles to their registered keepers and not to their legal owners, so that new cars acquired by households by means of leasing are therefore recorded as new registrations by these households, not by the leasing company. If, at the end of the lease agreement, the leased vehicles are sold to households (either the household of the registered keeper or another household), these cars will be missing from the re-registrations of vehicles from commercial to private keepers recorded by the Federal Motor Transport Authority. Consequently, the data of the Federal Motor Transport Authority on new registrations and re-registrations, which is insufficient for national accounts purposes, needs to be adjusted twice corresponding to the leasing transactions.

Part of the comprehensive information on macroeconomic leasing volume, broken down by product group and sectorally by lessee, that the ifo Institute for Economic Research collects and publishes annually is used for this purpose. This makes it possible to estimate the volume of private car leasing and its ratio to all new registrations by households. In line with the quarterly distribution of these new registrations, the annual leasing volumes are also divided by quarter and, within the Federal Motor Transport Authority data on new registrations, reallocated from the households to the leasing enterprises, specifically NACE/WZ division 77 “Rental and leasing activities”. As a result, investment in machinery and equipment rises at the expense of household consumption, with no impact on GNI.

As a second adjustment, these cars need to be eliminated from the leasing companies’ GFCF in machinery and equipment at the end of the lease agreement. The following assumptions apply:

- Vehicles leased by households are not sold to investors as used cars at the end of the contract, but are either purchased outright by the lessees themselves or sold by the lessors to other households in Germany.
- The average term of a private lease is 30 months.
- Privately leased cars are homogeneous in terms of prices with vehicles financed in other manners.

As a result, the passenger car numbers reallocated from new registrations to WZ 77 30 months ago, i.e. 10 quarters, are converted to their residual values and then subtracted from machinery and equipment withdrawn as a disinvestment and correspondingly added to consumption, again with no impact on GNI. For calibration of the residual value, the respective passenger car numbers are weighted with a second-hand price for three-year-old commercial cars, calculated by Deutsche Automobil Treuhand (DAT) on behalf of the Federal Statistical Office.. The simple premises mean that a slight blurring in the demarcation between private consumption and investment in machinery and equipment is once again conceivable, but this will balance out over a number of periods. Cross-border leasing transactions are nonetheless not correctly reported using the method described.

Reconciliation of the CF account with the special assessment for passenger cars (serial no 54):

5.298 To ensure exhaustiveness and consistency of the commodity flow account, and also for control purposes, the commodity flow measurement approach for capital formation in passenger cars is provisionally maintained up to the first intermediate result for GFCF in new machinery and equipment (serial no 53). The positive or negative difference

between the final special assessment for passenger cars and the passenger car commodity flow account is then added with the reconciliation item for special assessment for passenger cars (serial no 54).

Strictly speaking, the passenger car account also includes the trade in used cars, which is however described in the following section.

d) Used machinery and equipment

- 5.299 The additional accounting items that have been described so far lead us from the baseline values of output, exports and imports to the GFCF in new machinery and equipment (serial no 59), which in themselves form an independent and published result of the commodity flow account. In order to determine the aggregate GFCF in machinery and equipment as item AN.113 of the GDP expenditure approach, the balance of purchases and sales of used machinery and equipment must be added to the value of GFCF in new machinery and equipment.

In Germany, investors have always sold more used capital goods than they have purchased for each of the items mentioned below, so that net sales were always positive. It was therefore entirely a question of deductions in the commodity flow account. The main purchasers of used machinery and equipment are the rest of the world, in which case the counterentry is made under the heading of exports, and households, in which case the purchases are counterbooked as household final consumption expenditure. For the sake of convenience, scrapped machinery and equipment are included under the general heading of net sales. As well as the rest of the world, which might buy used capital goods direct or through a retailer, final purchasers of used machinery and equipment may be enterprises, in which case the counterentry is made under the heading of intermediate consumption. Where used fixed capital is sold to other investors within the same clearly defined accounting area, however, the value of the acquisition and that of the disposal cancel each other out. The balance is therefore zero, and such transactions may be disregarded in the national accounts. A representation of the internal trade in used goods, classified by industry, cannot at present be statistically substantiated in Germany. For this reason, the breakdown by industries of the investor account is only available for new machinery and equipment (Neue 3; serial no 59).

Exports and imports of used machinery and equipment (serial nos 60 and 61)

- 5.300 Neither the export nor import of used machinery and equipment can currently be fully reported. That would require a separate foreign trade code for each and every category of used product. Significant undercoverage probably occurs in the case of aircraft, for example, when German airlines modernise their fleets. Such undercoverage, however, does not influence the total value of GFCF in machinery and equipment, the figure used in the calculation of GDP, but it does affect the borderline between new and used machinery and equipment. Used road and rail vehicles and used ships are a particularly significant factor in commodity flow items 59 and 60. The foreign trade statistics explicitly indicate the used land vehicles imported and exported, but exports of used ships are not recognisable as such unless the ships are sold to be broken up in a foreign yard. For this reason, an estimate is made in the foreign trade statistics for purposes of national accounts; this estimate involves checking all individual ship registrations and identifying used ships on the basis of their clearly lower average values. The export figures have previously been adjusted by these values to exclude any double adjustment. (This pre-adjustment is included in commodity flow item serial no 21).

Net sales of used machinery and equipment to households (serial no 62):

- 5.301 At the present time, only the sales value of used cars is recorded in this entry. Other product groups (such as working tools) are unlikely to account for a significant volume of fixed capital in any areas of economic activity. The net sales of used cars are obtained from the number of re-registrations on change of ownership which is indicated in the quarterly registration figures issued by the Federal Motor Transport Authority. These statistics show details both of purchases by investing industries from households and of purchases by households from investing industries, which predominate as a rule. The numbers from the registration statistics are assessed using second-hand prices that are set within the calculation of household consumption on the basis of the described DAT price calculations.

Scrapping of machinery and equipment (serial no 63):

- 5.302 The estimation of the value of scrapped machinery and equipment was previously based on statistical data from the iron and steel industry (EVAS 42311) on scrap metal delivered to blast furnaces, steel works and ferrous-metal foundries, one third of which was estimated to originate from scrapped equipment. These statistics were, however, discontinued in 2011. Since then, information from non-official sources, such as reports from the Confederation of German Steel Recycling and Waste Management Companies (Bundesvereinigung Deutscher Stahlrecycling- und Entsorgungsunternehmen e.V. (BDSV)) and the German Steel Federation, has been analysed. The exact causes of scrapping cannot be recorded statistically, so that considerable uncertainty is attached to the estimation of this deduction item.

Outflows of used military weapons systems (serial no 65) are discussed in the following section.

e) Military weapons systems:

- 5.303 As mentioned earlier, since the introduction of ESA 2010 weapons and weapons systems used exclusively for military purposes are now also recorded as capital formation.⁹² In Germany they are attributable exclusively to general government (sector S.13). For reasons of secrecy, they are only published aggregated with GFCF in machinery and equipment, although they do not belong to ESA balance sheet item AN.113, i.e. to machinery and equipment, but form a separate category (AN.114). The valuation of the military weapons systems takes place outside the commodity flow account for the determination of equipment within the calculation of general government consumption (see also sections 3.21 and 5.9). The resulting data for acquisition of new military weapons systems are incorporated into the commodity flow dimension in reconciliation item serial no 54. The sale of used military weapons systems abroad, which is also determined outside the commodity flow, is entered as a disinvestment under serial no 65.

5.10.3 Cultivated biological resources

- 5.304 Net increases in the value of cultivated biological resources are assessed in the framework of the Economic Accounts for Agriculture (EAA) and the figures are incorporated into the national accounts by the Federal Statistical Office. However, only the changes in inventories are reported in the Economic Accounts for Agriculture. Therefore, since

⁹² Non-military weapons (e.g. hunting weapons, police or private security equipment) should already have been entered as machinery and equipment. The same applies to non-weapons used for military purposes, such as field kitchens or orderly room facilities.

the revision in 2014, the calculated consumption of fixed capital for tree, crop and plant resources (it has been agreed that livestock should not be depreciated) has been added to the changes in inventories, in order to be able approximately to identify acquisitions less disposals in accordance with the national accounts concept.

5.305 The **crops** that are planted because of the products they provide year after year are calculated based on acreage data and cost rates and include

- Fruit tree plantations,
- asparagus fields,
- hop fields, and
- vineyards.

For 2010, the change in inventories for crops was EUR +13 m.

5.306 Animals are considered as **livestock** if they repeatedly provide products for a period of more than one year and their natural growth or regrowth takes place under the direct control, responsibility and management of institutional units. They include breeding animals, dairy cattle, draught animals, sheep and animals used for transportation, racing or entertainment.

Animals intended for breeding or productive use at a later date (e.g. dairy cattle) which are not yet of breeding age and animals removed from breeding herds or flocks (e.g. beef cattle) are recorded as inventory stocks.

In 2010, the change in inventories for livestock, determined on the basis of the livestock census, was EUR -62 m.

Including the consumption of fixed capital, this results in the following acquisitions less disposals for cultivated assets in 2010 (EUR m):

Change in inventories of livestock	- 62
Change in inventories of crops	+ 13
Change in inventories of cultivated biological resources	- 49
Consumption of fixed capital for crops	351
Acquisitions less disposals of cultivated biological resources, published.....	302

5.10.4 Intellectual property products

a) Research and development

5.307 Until the 2014 general revision, the national accounts did not require the expenses for **research and development (R&D)** to be reported separately: The relevant expenditure for personnel and non-personnel costs as well as for externally purchased research results were already implicitly included in the accounts of the participants in the national economy and so were correctly recorded via the business surveys and the public finance statistics, even without having to be reported separately. However, the SNA 2008 and the ESA 2010 no longer treat expenditure for R&D as current expenditure, but rather as a capital asset.⁹³

⁹³ The definition and treatment of R&D services as a production activity are defined in section 3.82 of the ESA 2010, while fundamental aspects for recording the production of research and development in the national accounts are regulated under section 3.83 of the ESVG 2010. See also A. Braakmann: "Revidierte Konzepte für Volkswirtschaftliche Gesamtrechnungen", in: *Wirtschaft und Statistik* 8/2013, pages 521 – 527.

5.308 Due to the predominantly implicit reporting of R&D in production approach, the calculation of R&D investment also includes the calculation of the R&D outputs as a preliminary stage. A Eurostat guideline exists for both calculations.⁹⁴ Before discussing the methods of calculation, the key data sources are first presented:

- The biennial exhaustive surveys, broken-down by industries, by the Stifterverband für die Deutsche Wissenschaft, are consulted for the internal and external expenditure connected with research and development in the private sector as well as the personnel, while its summary surveys are used for the intermediate years.⁹⁵ The Stifterverband also provided one-off information on the useful life of the research results.
- The "Survey of expenditure, income and personnel of public institutions and institutions receiving public funding for science, research and development" (EVAS 21811) is an annual exhaustive survey of federal, state and other public research institutions (including science archives, libraries and museums), legally independent non-profit organisations for science, research and development, if they receive public subsidies of more than EUR 160,000 and legally independent institutes at universities.⁹⁶ This surveys the income and expenditure of the facilities by categories as well as fields of science, the percentage of research and development involved in the research personnel's overall activities, employees by scope, duration and type of employment as well as salary grades and educational background, including income by donors, every four years.
- The "Finance statistics of institutions of higher education" (EVAS 21371)⁹⁷ annually carries out an exhaustive survey that records all the facilities that are part of a university, including university hospitals, based on the administrative data. This does not include facilities with an independent legal identity, such as legally independent research institutions at universities. It records all income and expenditure in technical allocation and budgetary classification, including the separate reporting of external funds that flow into the university budget. The R&D share at universities is based on the same information that is also used to calculate the monetary data of higher education institutions.⁹⁸
- International transactions with research and development are represented by the balance of payment statistics of the Deutsche Bundesbank (EVAS 83111). The reported "technological services" with a value of over EUR 12,500 include research and development services and primarily relate to remuneration for the development of new products and processes, including research consulting. It also includes EU-financed research projects.⁹⁹

⁹⁴ See Eurostat: Manual on Measuring Research and Development in ESA 2010. 2014 edition Luxembourg: Publications Office of the European Union, 2014.

⁹⁵ See Wissenschaftsstatistik GmbH: "Forschung und Entwicklung in der Wirtschaft" (Research and Development in the Economy). Report on the R&D surveys 2003 and 2004, Essen 2006, pp. 48 – 52. The current results of the surveys are available at <https://www.stifterverband.org/wissenschaftsstatistik>

⁹⁶ See German Federal Statistical Office: Quality report "Survey of expenditure, income and personnel of public institutions and institutions receiving public funding for science, research and development 2007", Wiesbaden 2009.

⁹⁷ With regard to this section, see Federal Statistical Office: Quality report "Finance statistics of institutions of higher education", Wiesbaden 2013.

⁹⁸ Regarding the finances of institutions of higher education see Federal Statistical Office: subject-matter series 11, series 4.5 "Education and culture, finances of institutions of higher education 2012", Wiesbaden 2014.

⁹⁹ See Deutsche Bundesbank: Technological services in the balance of payments. Special Statistical Publication 12, Frankfurt a. M. June 2011, p. 51.

for research and development. The internal R&D expenditure, recorded according to the concepts in the Frascati Manual, are not adequate in order to determine the output additively based on the cost approach, rather it must be supplemented (among others including depreciation for R&D production and an imputed operating surplus) and transferred to the cost categories within the meaning of the NA. This transfer takes place in so-called bridge tables pursuant to the Eurostat guideline for every reporting year.

- 5.312 The output is determined in multiple steps. The starting point is the data on the internal R&D expenditure. It includes personnel expenditure, other current expenses and expenses for capital goods. Expenses for capital goods or capital expenditure are not included in current production expenses and so need to be deducted from internal R&D expenditure. Instead, the use of the material capital goods procured for R&D purposes pro rata temporis are included as costs of production in the form of derived depreciation in the output. This depreciation is determined as part of the national accounts balance sheet. (Own-account) software has already previously been recognised as an capital formation in the national accounts. However, R&D can be performed in order to produce software and software can be used in order to implement R&D. To avoid double counting, the estimated own-account software for R&D by industry is deducted from the internal R&D expenditure.
- 5.313 For the transfer from production costs to market prices, other taxes on production that arise for R&D generation are then added and other subsidies are deducted. The total other taxes on production for all production activities differentiated by industries are provided by the national accounts production approach. Of these, according to the information provided by the government accounts, about 95% are assigned to sector S.11 non-financial corporations and 5% to sector S.12 financial corporations. In the NACE/WZ division 72 research and development, they accounted for about 0.2% of personnel expenditure of this industry in 2010. This ratio is applied to determine the other taxes on production for R&D as an extrapolation across the macroeconomic R&D personnel expenses and proportionally divided into sectors of the economy in S.11 and S.12 in which the R&D personnel expenses arise. Other subsidies for R&D occur only in sector S.11. They are determined as part of the production approach, distinguished by industries.
- 5.314 In order to evaluate production independent of its market assignment, a net operating surplus must be assumed for own-account research and development by market producers. It is determined as a profit mark-up on the internal R&D costs from the "Projected data from the annual financial statements" of the Deutsche Bundesbank.
- 5.315 The determination of the R&D outputs of sector S.13 General government, is explained in section 5.9 of this method description. It flows into the results of industries 72, 84, 85 and 91. The R&D outputs of sector S.15 are based on the aforementioned statistics on public institutions and universities. Some of these institutions are assigned to sector S.15 in accordance with the NA production approach and subsequently processed in a similar way as the data on sectors S.11 and S.12. They contribute to the results of industries 72, 85 and 91.

Gross fixed capital formation in R&D

- 5.316 The starting point for the calculations is the internationally agreed broad definition of capital formation in R&D, including all internally produced and externally procured research and development services for capital formation in intellectual property products. The only exception is R&D purchases of industry 72 research and development: These purchases are reported as intermediate consumption, as it is assumed that NACE/WZ division 72 allows externally procured research and

development to flow into its internal R&D services and that these are then recorded as an capital formation by the customer.

- 5.317 The central task of the R&D capital formation assessment for non-governmental sectors S.11, S.12 and S.15 non-profit institutions serving households is to track the transition of domestic R&D outputs and domestic income generation by taking account of domestic and foreign trade with R&D to the (final) use of the R&D services. In principle, the R&D investment amount of an industry or sector differs from the trade balance by the amount of its R&D output and is comprised of purchased and own-account R&D capital formation.
- 5.318 The internal and external R&D expenses of the economy from the biennial surveys by the Stifterverband as well as the (above a low threshold of 12,500 euros) comprehensive recording of international transactions with R&D from the balance of payment statistics of the Deutsche Bundesbank, provided as annual data without sectoral classification, are available as important data sources for corporations. Both data sources are supplied to the NA as special formats, divided by industry.
- 5.319 The investment calculation itself its performed as an annual account in three stages. The first step is linked to the R&D outputs, which are supplied broken down by industries and by sectors. Exported R&D services, which are provided from the prepared balance of payments statistics by divisions of industry, are deducted from these values. The respective sectoral components are estimated. This results in the domestically generated domestic availability of R&D services differentiated by manufacturing divisions of industry and sectors
- 5.320 The second step tracks the transactions with R&D services between divisions of industry or economic sectors at this level, with the implicit assumption that only domestically produced R&D services are purchased and sold between domestic trading partners. While all data on R&D purchases and sales by the government sector is available, it is not adequately categorised by trading partners. For the remaining sectors, the information from the R&D survey by the Stifterverband provides the starting point. In accordance with the requirements for the national accounts, these two statistics from different sources, which are to some extent contradictory, are harmonised by settling the difference from the data provided by the Stifterverband on external R&D orders by the private economy to the government as well as their R&D purchases from the government and the internal expenses financed by the government with government sales to S.11, separately by division of industry in line with the amount of their external R&D orders to the government. Any residues are processed via WZ 72 "research and development" in S.11.
- 5.321 Another determination relates to the available external R&D procurement within the economy, which is separated by affiliated and non-affiliated companies, from the R&D survey by the Stifterverband. This assumes that affiliated companies predominantly belong to the same division of industry, while non-affiliated companies do not. This means that external R&D orders to affiliated companies do not lead to an outflow of R&D services from the respective division of industry and the relevant R&D output is equal to R&D capital formation. By contrast, according to this interpretation, external R&D orders are directed towards non-affiliated companies in another industry, such as to WZ 72 research and development, which need to be separately identified. An internal R&D cross-table was created for this purpose, which compares R&D production and external R&D orders to non-affiliated companies. Besides the aforementioned sources, additional information on, for example, research associations, product information and other investment relationships, was used in this cross-table.

5.322 The third step completes the domestic availability of R&D by adding R&D imports. Similar to R&D exports, imports, structured by divisions of industry, are also taken from the data on the movement of technological services in the balance of payments and allocated to a sector.

**Table 5–29: Generation and use of research and development
by industries**

Year 2010 at current prices (EUR billions)

WZ 2008	Output	Net purchases	Intermediate consumption ¹⁾	Capital formation
Agriculture, forestry and fishing	0.121	0.046		0.167
Mining and quarrying	0.013	0.005		0.018
Manufacturing.....	40.061	-0.372		39.689
Electricity, gas, steam and air conditioning supply	0.079	0.033		0.112
Water supply, sanitation and similar.....	0.005	0.001		0.006
Construction.....	0.057	0.004		0.061
Wholesale, retail, transport and hotels and restaurants.....	0.181	0.138		0.319
Information and communication	2.345	-0.278		2.067
Financial and insurance activities	0.280	0.022		0.302
Real estate activities	0.000	0.000		0.000
Administrative and support service activities	12.869	-5.126		7.743
Of which: Research and development....	12.154	-3.146	2.696	6.312
Public administration and defence; compulsory social security.....	0.497	1.312		1.809
Education.....	8.138	-1.083		7.055
Public health and social work activities	2.542	-0.200		2.342
Other service activities.....	0.225	0.011		0.236
All industries.....	67.413	-2.791	2.696	61.926
Of which: Sector S.13 General government	14.456	-0.347	1.509	12.600

¹⁾ Only R&D purchases for WZ 72 research and development are reported as intermediate consumption.

Government capital formation in R&D

5.323 Similar to market producers, to determine the gross fixed capital formation of non-market producers in research and development, the sale of R&D services must be deducted from their R&D output and the research and development that they have purchased (e.g. contract research) must be added. Special aspects of these calculations for certain areas of non-market production are briefly summarised below:

- Purchased R&D is also included in the capital formation by the government sector. The federal government is particularly active in this segment and contracts a significant amount of research (including defence research). Contractors may be government units (e.g. universities or R&D institutions), non-profit institutions serving households or companies.
- A distinction is made between basic research and funded research for state universities. While basic research is entirely recorded as own-account research and for internal use by the sponsor of the state university, for funded research, the part that relates to contract research is reported as a sale to third parties (federal government, company). The third module, externally procured research and development by state universities, is assessed as

negligible.¹⁰¹ As a result, R&D capital formation by state universities consists of own-account research and development for internal use.

- The starting situation for government research institutions for determining R&D capital formation is similar to the situation for universities. In this case, government research institutions also sell parts of their R&D services to third parties (government, business), if they perform research on behalf of these third parties. Research and development procured by government research institutions, i.e. externally contracted research projects, cannot be quantified by the data, but it is likely that this plays an insignificant role. As is the case for state universities, R&D investments by government research institutions consist of own-account R&D for internal use. This also includes departmental research, which is regularly prepared by federal and state institutions.

5.324 In addition to contract research, the government also has other opportunities for funding research, such as institutional research funding, project funding inside and outside universities or the subsidisation of research facilities, including large research apparatus. These measures are generally not reported as sales in the national accounts, but rather as transfers to the respective unit. This type of research funding is therefore part of own-account R&D.

b) Mineral exploration and evaluation

5.325 Exploratory drilling takes place in the course of prospecting for deposits of petroleum, natural gas and other mineral resources, whereas commercial drilling serves to exploit the resources that have been discovered and forms part of gross fixed capital formation in buildings and structures. The value of mineral exploration as a fixed asset is not only the cost of the drilling itself but also the ancillary costs, such as expenditure on aerial photographs and surveying. Two sources are used to determine the value of mineral exploration:

5.326 Exploration designed to identify oil and gas deposits is chiefly conducted by enterprises in WZ subclass 09.10.0 "Service activities incidental to oil and gas extraction, excluding surveying". The value of mineral exploration is assessed with the aid of turnover figures for this area of activity from the monthly manufacturing reports. The annual report on drilling activities in Germany that is published by the Regional Soil Research Office of Lower Saxony (Landesamt für Bodenforschung) provides the basis for a percentage-wise division into exploratory and commercial drilling (the latter being GFCF in buildings and structures). With these percentages, which are applied to the domestic turnover indicated in the monthly report, the value of exploratory drilling is then assessed. According to historical data from a major supplier of natural gas, expenditure on surveying and aerial photogrammetry and other prospection costs account for about 30 % of expenditure on mineral exploration. For this reason a 30 % allowance is added to the cost of exploratory drilling to cover these ancillary services.

5.327 Mineral exploration is also performed by companies in industry 43.13 "Test drilling and boring" for building, geophysical, geological or similar purposes. Consequently, the annual output for this economic activity class as derived from the survey of construction companies is divided, on the basis of an estimate, between GFCF in structures and buildings and intellectual property products (mineral exploration), and each is recorded separately.

¹⁰¹ Purchased contract research is not a separate characteristic in university financial statistics and is recorded in one of the items included as other current expenditure. In the system of national accounts, this would mean that purchased contract research is considered intermediate consumption, as other current expenditure is generally reported as intermediate consumption in the National Accounts.

For 2010, this results in a value for mineral exploration of 0.203 billion euros excluding value added tax and 0.206 billion euros including non-deductible value added tax.

c) Computer software and databases

- 5.328 Computer software and databases, which are used in production for more than one year, are also considered intellectual property products. A distinction must be made for purchased software and own-account software, for which separate estimates are made in Germany. At a conceptual level, it is important to ensure that intermediate consumption-related and investment parts of the software segment are not confused and that this segment is also distinguished from the research and development segment. This and other aspects are outlined briefly below.
- 5.329 Within the meaning of the ESA 2010, only independently purchased software is treated as intellectual property products, in contrast to software that was purchased together with IT hardware, or software that is permanently integrated into machinery and devices. This must not be taken into account, together with training, consulting or other services. In the national accounts, purchased software includes the value of those transactions which, though concluded as licensing agreements in the strict sense of the law, are actually effected like normal purchases in the sense that the customer pays the full amount on procurement and is free to sell the software on to a third party and that the software must be entered in the accounts as the customer's asset.
- 5.330 In the case of own-account software, developments for internal use or internal developments of service providers for the market must be assessed as capital formation in intellectual property products, while basic research in the software segment is not. Own-account software for internal use can be developed in all sectors and industries, not just by software companies.
- 5.331 In the case of databases, purchases of data collections that are recognised in the balance sheet and the initial establishment of marketed data collections must be treated as an capital formation in intellectual property products, while the establishment of data collections for internal organisational, business or administration purposes, such as customer, patient, purchasing or inventory lists as well as the maintenance of marketed data collections are not considered intellectual property products.

Estimating the value of purchased software

- 5.332 The statistical basis for the valuation of purchased software is relatively weak in Germany.¹⁰² Non-official analyses and studies conducted by market-research institutes and trade associations as well as specialised journals on software, computer, IT and multimedia markets, etc. do provide some clues, but in many cases the categories to which their data relate are not clearly defined, and the figures are scarcely comparable with each other. Most market assessments of this kind are based on figures and estimates relating to sales in the relevant industries or subclasses of industries. Their main shortcoming lies in the mixing, whether complete or partial, of software sales, licence revenue, training, advisory or other services and hardware sales - in other words, they combine elements of fixed capital formation with elements of intermediate consumption. They are used as rough indicators of extrapolations or interpolations and to check the plausibility of the purchased software. The ratios of software to correlating variables, such as equipment investments in office machinery and data-processing machines, are used as a plausibility framework for both extrapolations as well as for quarterly estimates.

¹⁰² Recent survey data for the manufacturing industry were previously incomplete and were too contradictory as a basis of calculation.

- 5.333 An estimation model, which is based on anonymised random sample results from special questions in the ifo Business Survey for 1995 to 2000, not including 1997, as well as data from the structural survey in the service sector (EVAS 47415) from reporting year 2000, is used.
- The special questions on the ifo Business Survey, which surveyed approximately 3,000 companies from the manufacturing industry and the construction industry, were used to calculate ratios of purchased software for recognised intangible assets or intellectual property products as well as ratios in three alternative, potential expansion factors (employees, sales and machinery/equipment).
- 5.334 Three levels of software intensity (each being the ratio of the total for the sample to the total for the relevant activity divisions in the national accounts) can be formed with the aid of appropriate data from the national accounts for the three projection media referred to above as a first step. This gives three alternative extrapolation results which for most NACE/Wz divisions are combined into a weighted average.
- 5.335 In the second step in the projection process, the figures for the industries covered by the sample (manufacturing and construction) are used to draw conclusions about the other industries that the sample does not cover. In this case, assumptions are first made on the relative importance of purchased software in the missing WZ divisions compared to the results of the random sample in the form of weighting factors. For example, it is certain that comparatively lower software intensities exist in agriculture, while higher software intensities exist in research and development than in the manufacturing and construction industries. Accordingly, factors greater or smaller than 1 were assigned to these other areas of activity. As a result, differentiated 'software intensities', albeit strongly influenced by these estimates, are also used to extrapolate the WZ divisions not covered by the sample. By this means estimates are avoided that are entirely arbitrary or are uniformly pegged to the figures for the manufacturing and construction industries.
- 5.336 From reporting year 2000 onwards, data for purchased software is available for sections H, J, L, M, N and S (division 95) is available pursuant to the classification of industry 2008 (WZ 2008) by annual structural statistics in the service branches (SiD), allowing these sectors to be removed from the aforementioned projection and the estimate to be improved. As a response to the question of purchased software only has to be provided by survey units with sales in excess of 250,000 euros, an under-coverage surcharge is estimated for smaller companies, which is based on the ratio of purchased software to total gross fixed capital formation for large companies.

Estimating the value of own-account software

- 5.337 As is the case for purchased software, the data basis in Germany is also sub-optimal for own-account software. In accordance with German accounting policies, intangible fixed assets produced for companies' own account have now been assigned an option to capitalise, however direct measurement of software produced for companies' own account by surveys have not been promising in Germany.
- 5.338 This presumption is confirmed by the results of the aforementioned ifo surveys, for which the prohibition on capitalising own-account software was still applicable. The surveys for 1995 and 1996 included a question about own-account software, but the estimate extrapolated from the responses, for 1995 at least, was most implausibly low.¹⁰³ For this reason we based our estimate on a model, which is outlined below.¹⁰⁴

¹⁰³ From reporting year 2012, the annual structural statistics in the service branches at least could provide information for companies with sales in excess of 250,000 euros that are active in these industries.

5.339 The quantitative basis for the estimation is formed by employment data drawn from the annual microcensuses on computer-centred occupations. The main relevant occupations listed in the German Directory of Occupational Codes, 1992 edition¹⁰⁵, as used for the microcensus, are as follows:

- 774 DP specialists, computer scientists, mathematical/technical assistants, etc.,
- 7750 Software developers, general,
- 7751 Application-software developers,
- 7752 System-software developers,
- 7753 Software-development managers,
- 776 Data-processing organisers, systems analysts and related occupations,
- 777 DP consultants and sales specialists,
- 778 Data centre specialists, IT administrators,
- 779 Occupation-centred or industry-centred data-processing specialists,
- 783 Data loggers, keyboarders, validators, etc.

First of all, a straight head count is made of all the representatives of these occupational categories, i.e. irrespective of occupational status, position within the company, full-time or part-time employment, etc. Another category was formed to cover the many employees in other non-computer-centred occupations who nevertheless engage in data processing in the wider sense. This additional category is:

- 9999 Practising data-processing specialists in other occupations

In this case, employees in technical occupational groups 60 and 61 (engineers and scientists) as well as 62 (technicians, selected groups only) are combined, if programming activity cannot be ruled out as the primary activity according to the microcensus.

5.340 In all, the 2010 selection process identified some 770 000 employees who could in theory be assumed to be involved in the production of own-account software as capital formation. The next step in the effort to circumscribe own-account software in a plausible manner involves classifying these employees on the basis of three principal criteria. Besides the eleven occupational categories listed above, the microcensus assigns employees to 88 NACE categories (two-digit WZ divisions) and to ten departmental divisions, i.e. the parts of companies in which the respondents work:

1. Fabrication, production and assembly,
2. Maintenance, repair and input production,
3. Operations planning and monitoring and related activities,
4. Research and development, construction, design and prototype construction,
5. Material management, purchasing, stockkeeping and material distribution,
6. Sales, marketing, service, advertising and public relations,
7. Finance, law, accounts, data processing, statistics and related activities,
8. Personnel, training, medical and welfare services, etc.,
9. Company management, management of administrative bodies, boardroom activities,
10. Businesses not divided into departments.

The entire model therefore comprises several thousand elements.

¹⁰⁴ An estimate of the input side is considered to be an adequate approach at an international level.

¹⁰⁵ The 1992 classification of occupations applied for this method description in the reference year of 2010. This has now been replaced by the 2010 classification of occupations, so the estimation model will have to be amended in the future.

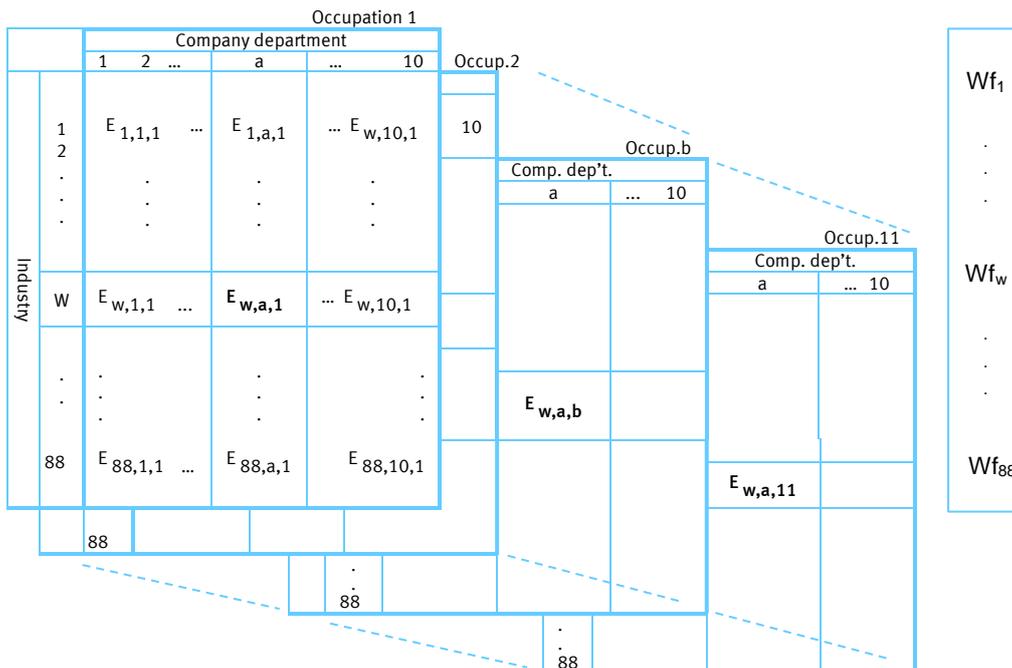
5.341 The crucial factor for the estimated level of own-account software is the assumption as to the percentage of their time the selected employees actually spend on the production of own-account software as defined for national accounts purposes (their 'rate of involvement'). Assumptions about the rate of involvement are essentially three-dimensional in the model, in the sense that they are based on occupations, departments within companies and categories of economic activity, but that the sample is not broken down into combinations of all the elements but into 11 occupational groups, 10 departmental categories and 88 industries. The rate of involvement for a particular element is derived from the multiplication of the relevant factors.

Figure 5–13: Own-account software (OAS) as recorded in the national accounts

Terms:

$E_{w,a,b}$	=	Number of employees (acc. to microcensus)	in the WZ/NACE classification in the company department in the IT-specific occupational group	w a b	$1 \leq w \leq 88$ $1 \leq a \leq 10$ $1 \leq b \leq 11$
W_f_w	=	WZ-factors	= partial activity-specific OAS relevance		
B_f_b	=	occupational factors	= partial occupation-specific involvement rate in production of OAS		
A_f_a	=	departmental factors	= partial department-specific involvement rate in production of OAS		$0 \leq \text{Factor} \leq 1$
$BA_f_{b,a}$	=	combination factor: occupational dept.	= combination: occupation-specific involvement rate in company departments		
G_b	=	pay level	= occupation-specific annual gross salary in EUR		
T_b	=	part-time factor	= occupation-specific part-time factor, collectively agreed work hours = 1		$Z_b \geq 1$
Z_b	=	allowance	= imputed overheads and profit mark-up		
K_b	=	costs	= average annual total costs per employee in EUR $= G_b * T_b * Z_b$		

Illustration of the terms:



		Company department														
		1	2	...	a	...	10									
Occupation	1	BAf _{1,1}	...	BAf _{1,a}	...	BAf _{1,10}	Bf ₁	G ₁	T ₁	Z ₁	K ₁					
	2															
	...															
	...															
	...															
	b	BAf _{b,1}	...	BAf _{b,a}	...	BAf _{w,10}						Bf _b	G _b	T _b	Z _b	K _b
	...															
	...															
	...															
	...															
	11	BAf _{11,1}	...	BAf _{11,a}	...	BAf _{11,10}										
...																
...																
...																
...																

Af ₁	Af _a	Af ₁₀
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Results:

$$\begin{aligned}
 OAS_w &= \text{own account software by industries} &= \sum_a \sum_b E_{w,a,b} * Wf_w * ABf_{a,b} * K_b, & w = 1,2,3,...88 \\
 OAS_b &= \text{own account software by IT-specific occupations} &= \sum_w \sum_a E_{w,a,b} * Wf_w * ABf_{a,b} * K_b, & b = 1,2,3,...11 \\
 OAS_a &= \text{own account software by company departments} &= \sum_w \sum_b E_{w,a,b} * Wf_w * ABf_{a,b} * K_b, & a = 1,2,3,...10 \\
 OAS &= \text{total for own account software} &= \sum_w \sum_a \sum_b E_{w,a,b} * Wf_w * ABf_{a,b} * K_b
 \end{aligned}$$

5.342 The result is the assumption that, for example, a general software developer (7750) who works in the production and assembly division of a company manufacturing metal products (factors 75 % x 10 % x 50 %) has an imputed involvement rate of 3.75 % in the development of own-account software as defined in ESA 2010, but a general software developer (7750) in the same area of economic activity is involved in the DP office division at an imputed rate of 18.75 % (factors 75 % x 50 % x 50 %). For reporting year 2000, the overall average involvement rate for all respondents from the relevant occupations – a total of about 770 000 employees – came to approximately 7.6 %.

Table 5–30: Overall figures for own-account software by occupation

Year 2010 (summarised model results)

Selected occupations	Input		Employee equivalents	Input	Input	Cost per employee equivalent EUR	Estimate for own-account software	
	Employees	Involvement rate, rounded		Gross salary	Total allowance rounded		Million	
	Number	%	Number	EUR/year		EUR	EUR	%
	1	2	3 = 1x2	4	5	6 = 4x5	7 = 3x6	8
7740 DP specialists, computer scientists, mathematical/technical assistants, etc.	205 200	7.7	15 728	56 760	2.227	126 396	1 988	25.1
7750 Software developers, general.....	136 000	14.6	19 788	63 067	2.183	137 702	2 725	34.4
7751 Application-software developers.....	29 600	17.2	5 080	69 374	2.112	146 550	744	9.4
7752 System-software developers	18 500	17.0	3 153	75 681	2.228	168 642	532	6.7
7753 Software-development managers.	2 700	5.0	136	88 294	2.397	211 655	29	0.4
7760 Data-processing organisers, systems analysts and related occupations	39 000	7.2	2 807	56 760	2.252	127 829	359	4.5
7770 DP consultants and sales specialists.....	99 600	3.1	3 099	56 760	2.291	130 025	403	5.1
7780 Computer-centre specialists, data managers	88 800	3.8	3 348	56 760	2.156	122 359	410	5.2
7790 Occupation-centred or industry-centred data-processing specialists.....	50 600	6.5	3 275	63 067	2.228	140 522	460	5.8
7830 Data loggers, keyboarders, validators, etc.	12 600	3.4	429	31 534	1.631	51 446	22	0.3
9999 Practising data-processing specialists in other occupations	89 297	2.2	1 969	56 760	2.286	129 739	255	3.2
All selected occupations	771 897	7.6	58 809	61 226	2.201	134 784	7 927	100

5.343 The estimation of the involvement rate is absolutely crucial to the result of the model. Reflections and studies indicate that, of the ten types of company department listed in the 2010 microcensus, categories 4, 7 and 10 are the ones in which significant rates of involvement in the production of in-house software are most likely to occur. The data-processing staff in the other departments, by contrast, presumably spend the bulk of their working hours on routine activities in the production process or in the provision of services, activities which do not count as capital formation. If we consider the occupational dimension in isolation, it is assumed that occupational categories 7750, 7751 and 7752 are very heavily involved in the production of in-house software, categories 7440, 7753 and 7760 are significantly involved, and the other categories

have little involvement. As for the industry dimension, some lines are drawn within the model in order to take account of the special features of various types of software:

- In some cases, clear deductions in WZ divisions 25-33 (capital goods producing sectors); this is based on the assumption that a high ratio of product-integrated software is used in industrial manufacturing in these industries, which, according to ESA 2010, cannot be counted towards purchased software.
- Significant deductions in WZ division 62 and 63 (provision of information technology services and information services); this takes account of the significant expense of ensuring that software simply remains marketable for predominantly unchanged performance specifications, which does not represent capital formation.
- Deductions in WZ 72 (research and development), due to the high ratio of basic research, which cannot be reported under software in accordance with ESVG 2010, but rather under GFCF in research and development.

5.344 The number of respondents in each category in the microcensus is multiplied by the average involvement rate for that category to produce the number of 'employee equivalents' engaged entirely in producing own-account software. In the next step, these 'employee equivalents' are multiplied by imputed labour-cost rates (as per ESA 2010, including a profit allowance). To this end, we began by estimating the average gross pay for each of the occupational groups. When it comes to estimating gross pay, the only available indicators are undifferentiated generalised data from the labour-cost survey and estimates or survey findings obtained from trade associations, specialised publications and business consultants; these data, too, are generalised, and there are huge variations between them. The next step is to apply the usual valuation methods to the gross pay levels, adding imputed allowances for welfare contributions, overheads, operating and capital costs, fitting-up periods, downtime and other non-productive periods. Any part-time factors that can be determined for each occupational group from the microcensus are included in the aggregate allowances shown in the above table.

5.345 In the selected occupational groups from the domain of data processing, the estimate for 2010 produced an average gross annual wage or salary of EUR 61 226. The total imputed adjustment factor (including a profit mark-up) taking into account the part-time factors is approximately 2.2.

5.346 The total value of own-account software in 2010 works out at EUR 7.9 bn. As has already been said, the institutional framework in Germany, in terms of the statutory accounting requirements, means that businesses can only be expected to provide very indefinite answers to direct questions regarding the value of the own-account software. In addition, it must also be borne in mind that the model presented here allows a considerable degree of latitude. For all the refinement of the tiered classification structures, this latitude lies primarily in the selection of the occupational groups that may be involved in the in-house production of software as a fixed asset and in the estimation of the actual involvement rates for these occupational groups.

d) Intellectual property rights

5.347 In accordance with ESA 2010, where the production of books, recordings, films etc. is concerned, the production approach records firstly the original created work and secondly the duplication and use of the original. The original created work is treated as an item of intellectual property and is accounted for as a gross fixed capital formation on the expenditure side under the heading 'Intellectual property rights'. A condition here is that the original created work should be an end product that is protected by

copyright and that the intended duration of commercial use should be more than one year. Thus unpublished manuscripts, for example, or – in view of their short lifespan – newspaper and magazine articles and news broadcasts do not generally count as gross fixed capital formation.

Software to which such criteria can equally apply is recorded separately (see section 5.10.4 Software). Paintings, sculptures and antiques are, unlike software, recorded not as gross fixed capital formation but as net additions to objects of value (see section 5.12). Licensing income or other fees gained through the above-mentioned use of the original are accounted for as service charges to the owner of the original on the production side.

Depending on the data available, copyright is valued at the sales price (films and television productions), at estimated production costs (sound recordings) or at the estimated present value of future receipts (originals that result from the artistic creativity of writers, musicians, composers, actors).

Original films and original material for radio and television programmes

- 5.348 In the course of the introduction of intellectual property rights on the basis of the then-applicable ESA 1995, the Federal Statistical Office investigated gross fixed capital investments for original films and original material for radio and television programmes in a detailed study¹⁰⁶ where reference was made to a range of non-official data sources. Detailed calculations were made for cinema films, fictional television productions and broadcasters' own productions, as well as for synchronisation. This process has since been retained in simplified form and now also includes the production of documentary and children's films, video productions and industry films, where it can be assumed that the duration of use will be several years. The relevant assumptions behind the simplified calculations for intellectual property rights were last checked in 2014 and considered to be still valid.
- 5.349 The simplified calculation is based on turnover returns in VAT statistics (EVAS 73311), which are permanently available and surveyed on a statutory basis. Turnover returns that are used are those from the relevant sub-items in WZ 59 'Motion picture, video and television programme production, sound recording and music publishing activities' and in WZ 60 'Programming and broadcasting activities'.¹⁰⁷ More specifically, the following are taken into account for the calculation: WZ 59.11 'Motion picture, video and television programme production activities', WZ 59.12 'Motion picture, video and television programme production activities', WZ 59.20.1 'Activities of sound-recording studios and production of taped radio programming', WZ 60.10 'Radio broadcasting' and WZ 60.20 'Television programming and broadcasting activities'. However, since this turnover also includes some which is not under copyright protection (such as business and advertising films, film engineering, sound studios), a deduction of 55% (rounded) is made. This deduction is calculated on the basis of data concerning the turnover structure of film production companies (TV producers, film producers, etc.) according to the type of turnover (television productions, motion pictures, advertising films, etc.) taken from a study by the state media authorities¹⁰⁸. The turnover statistics, however, do sometimes show large shifts

¹⁰⁶ See Frankford, L.: 'Urheberrechte in den Volkswirtschaftlichen Gesamtrechnungen' ('Intellectual property rights in national accounts') in WiSta 5/2000, pp. 320-327.

¹⁰⁷ The details of the categories of economic activities and their sub-items relate to the currently applicable Classification of Economic Activities 2008 (WZ 2008).

¹⁰⁸ Direktorenkonferenz der Landesmedienanstalten (Conference of directors of the state media authorities) (ed.): 'Film- und Fernsehwirtschaft in Deutschland 2000/2001' ('Film and television

from year to year, suggesting inconsistent allocation to time periods. For this reason, the reduced turnover figures described above from the VAT statistics are not used directly; rather, a two-year moving average is calculated and is used to provide a figure for intellectual property rights data from German television, radio and cinema productions.

The value of originals in this domain for 2010 is calculated as follows (in EUR million):

WZ 59 ... Motion picture, video and television programme production, sound recording and music publishing activities	4 751
+ WZ 60 Programming and broadcasting activities	612
= Total for WZ 59 and WZ 60	5 363
– Deduction of approx. 55%	2 937
= Reduced turnover.....	2 426
Rolling annual average.....	2 401

Sound recordings

- 5.350 In the realm of music, the Copyright Act distinguishes between musical works, which are the creative artistic output of composers; sound recordings, which are the technical economic output of manufacturers; and performances, which are personal interpretations of the musical works by the performing artists. These are three types of intellectual property which are protected by copyright and which generally generate income for more than one year. For this reason, in the field of music – unlike films, where the film producers alone have economically realisable rights – it seems appropriate to separate out originals both for the originators and for the musicians and interpreters.
- 5.351 The value of originals belonging to producers of sound recordings is assessed at production costs. The assessment basis is a survey¹⁰⁹ (which has not been updated since) on production costs for sound recordings in the years 1993 to 1995, which was conducted by the Ifo Institute for Economic Research in cooperation with what was then the German Federation of the Phonographic Industry (Bundesverband der Phonographischen Wirtschaft e.V.¹¹⁰), the respondents being the members of the Federation.
- 5.352 The Federation estimated that the survey covered about 80% of the total expenditure incurred by German sound recording producers. The findings of the survey for the years 1993 to 1995 were therefore multiplied by 1.2 to obtain the estimated total value of original sound recordings. A figure of EUR 850 m resulted for 1995 and was extrapolated in the subsequent years to include the development of the fees paid to self-employed artists and to compensation groups according to information from the Artists' Social Welfare Fund (Künstlersozialkasse), in conjunction with the development of the royalties paid by various companies exploiting third-party rights

industry in Germany 2000/2001'). Schriftenreihe der Landesmedienanstalten (Papers of the state media authorities), Volume 26, Berlin 2001.

¹⁰⁹ Ifo Institute for Economic Research: Schätzung immaterieller Anlageinvestitionen in der Volkswirtschaft (Estimation of non-material fixed asset formation in the national economy). Report on behalf of the Federal Ministry for Economic Affairs, Munich 1997.

¹¹⁰ In 2007 the Bundesverband der Phonographischen Wirtschaft merged with the German section of IFPI to form the Bundesverband Musikindustrie (Federal Music Industry Association).

according to the GEMA business report, the annual report of the German Patent and Trademark Office (Deutsches Patent- und Markenamt) and the relevant business reports. The total figure for 2010 came to EUR 1 514 m.

Musical compositions, artistic interpretations and literature

- 5.353 Originals belonging to writers, composers, singers, actors and other independent artists are assessed, in the absence of known purchase prices, on the basis of the present value of future receipts. In place of the highly complex capitalised-sum method, based on assumptions about the duration of the exploitation period, about the development of revenue from royalties within that period and about the discounting rate, an estimation model is used which, though simple, demonstrably achieves good results, at least for Germany, and takes account of all royalties within the local economy for a calendar year (R_t), the rate of growth in total royalties in relation to the previous year (r_t) and the interest rate (i_t). The present value of the originals produced in year t (P_t) is calculated as follows:

$$P_t = R_t \times (1 + r_t - i_t).$$

- 5.354 The baseline assessment of the total amount of royalties for individual groups of artists is derived from estimates of the direct payments made by publishing houses to authors and of the distribution of royalties by the collecting societies – the collecting society representing authors and publishers (VG WORT), the Musical Performance and Mechanical Reproduction Rights Society (GEMA) and the Society for the Administration of Neighbouring Rights (GVL – Gesellschaft zur Verwertung von Leistungsschutzrechten).
- 5.355 In order to ascertain the value of the royalties distributed by the collecting societies, business reports and other information from the societies are used to estimate the amount of their budget that has been distributed to originators within Germany and to break down this amount by occupational groups. The collecting society GEMA has undertaken a special analysis for this purpose and has provided a distribution formula concerning the payment of royalties to composers, writers and music publishers.

The rate of interest is calculated annually as an arithmetic mean of the running yields of fixed interest securities from domestic issuers, published by the Deutsche Bundesbank.

Musical compositions

- 5.356 Royalties payable for more than one year to composers and arrangers of music in Germany are generally paid exclusively through the GEMA collecting society. The first step in the valuation of copyright for musical compositions is to establish how much money GEMA has distributed in royalties to composers and arrangers. To this end the total amount distributed by GEMA is reduced by the estimated amounts distributed abroad and to other German collecting societies. The remainder of the total amount distributed to German originators and publishing houses is then divided among occupational groups and publishing houses as appropriate.
- 5.357 For 2010, the amount distributed to composers and arrangers of music came to EUR 178 m. In a second step, the present value of the anticipated yield from these royalties is assessed by means of the simplified estimation method. In 2010, the value of copyright for musical compositions therefore amounted to approximately EUR 172 m.

Artistic interpretations

- 5.358 Under section 73 of the Copyright Act, interpreters of artistic works (singers, dancers, actors, orchestras, etc.) are afforded protection as performing artists. Section 73 lays down that the performances of a performing artist may not be made visible or audible to the public outside the place of performance by means of screens, loudspeakers, etc., and/or recorded on visual or sound media, reproduced and distributed without the consent of the performing artist. The ancillary rights of these artists are administered by the Society for the Administration of Neighbouring Rights (GVL). The GVL distributes royalties not only to performing artists (such as conductors, singers, actors, producers, orchestras, members of choirs and ballet companies, solo instrumentalists, singers and dancers and studio musicians¹¹¹), but also to producers of image and sound recordings as well as to promoters of cultural events. The GVL receives its income from payments for broadcasts and transmissions of sound recordings and video clips on radio and television, public playing or showing of radio and television programmes, sound recordings and video clips (e.g. in hotels, restaurants, cinemas, discotheques and on stage), reproduction for private and other use of radio and television programmes and of sound recordings (levy on copying and reproduction equipment).
- 5.359 In 2010, the GVL had a budget of EUR 183 m. With an assessed administrative-expenditure margin of 3.6% and an equal division of distributed royalties between performers and phonographic producers, the royalties paid out to performing artists amount to EUR 88 m. The simplified method of estimating the present value of anticipated receipts resulted in the valuation of copyright in respect of artistic interpretations for reporting year 2010 at EUR 86 m.

Literature

- 5.360 Writers receive royalties of more than one year's duration either direct from publishing houses or from the collecting societies WORT and GEMA. The value of the royalty payments from these collecting societies is estimated on the basis of the volume of their budgets in accordance with the method described above. The value of direct royalties from publishing houses can, in principle, be obtained either from the statement of royalty payments compiled by the Artists' Social Fund (Künstlersozialkasse) on the basis of annual returns or from information on turnover from the sale of books. The royalties paid to book authors are currently calculated at a royalty rate of 5.6% on the book turnover within Germany. Turnover data are drawn from the publications of the German Publishers' and Booksellers' Association (Börsenverein des deutschen Buchhandel).
- 5.361 On the basis of the amount of royalties paid directly to writers by publishing houses and of those distributed to them through the WORT and GEMA collecting societies, the value of anticipated revenue from copyright for 2010, as assessed by the simplified estimation method, works out at approximately EUR 637 m.

The total value of copyright for music compositions, artistic interpretations and literature in 2010 is EUR 895 m.

¹¹¹ Artistic professions are grouped together under WZ 90 Creative, arts and entertainment activities.

Classified by area of economic activity, the overall picture for copyright in 2010 is as follows (in EUR million):

WZ 59 ... Motion picture, video and television programme production, sound recording and music publishing activities	3 641
+ WZ 60 Programming and broadcasting activities	274
+ WZ 90 Creative, arts and entertainment activities	895
= Total for intellectual property rights	4 810

5.11 Changes in inventories

- 5.362 The ESA distinguishes between different types of inventory. Inventories of materials and supplies comprise goods that will later be used in production for intermediate consumption. These are also known as input stocks. Work-in-progress are produced goods and work commenced that are not yet completed. These would include, for example, agricultural crops that are still growing, construction works that have started, and partially finished software. Inventories of finished goods consist of outputs that the producer does not process further before supplying them to other institutional entities. An example of these would be stocks of vehicles ready to drive away. Inventories of work-in-progress and of finished products are also known as output stocks. Inventories of goods for resale are goods that will be resold without alteration to their condition.
- 5.363 The principle by which changes in inventories are calculated over a period is relatively simple: from each individual company report, a calculation is made of the changes in inventories' value by subtracting the reported value of inventories at the beginning of the period in question from the value of stocks at the end of the period; the sum for the total economy is then produced by aggregating the individual changes. In practice, calculating changes in inventories from company accounts is significantly more difficult than this: firstly because the tax rules on valuation do not necessarily correspond to those of the ESA, and secondly because the published inventory values also include 'paper profits' (and 'paper losses') arising from changes in the market price of the relevant inventories. Such price changes lead to changes in inventories (in the sense of changes to the value of the inventory over the period in question) even in the absence of any physical stock movements. In ESA 2010, therefore, they are designated as 'holding gains and losses'. Since such holding gains and losses do not result from production or usage, they need to be treated as value-neutral in the national accounts system, which is intended primarily to represent the production and use activities of an economy.
- 5.364 The problem of these holding gains is further complicated by the fact that in reality, inventory entries and withdrawals also take place at different points over the period in question. The theoretically correct method of recording changes in inventories would be to value inventory entries and withdrawals at the price applicable at the time of entry or withdrawal. In practice, the continuous valuation of all individual entries and withdrawals within a production process, i.e. a perpetual inventory, is not statistically practicable. ESA 2010 also recognises this and proposes various alternative solutions.
- 5.365 In Germany, alternative methods based on inventory comparisons are adopted. A distinction in terms of quality has to be made, however, between two options. The better, albeit rarer option, uses physical volume figures, the value of which can be fairly reliably assessed with the aid of market prices. Physical data is available in particular from the German National Petroleum Stockpiling Agency (Erdölbevorratungsverband). For most industries, in contrast, the physical quantities

are not known but only the book values as recorded in the cost-structure and other annual structural surveys.

- 5.366 Below is a description of the two types of standard process used to calculate nominal changes in inventories. In standard cases, the book values of inventories at the end of the year are compared with those from the previous year, in order to calculate book value changes. These book values are available on an annual basis from structural surveys in different industries, and for three types of inventories (materials and supplies, output inventories, goods for resale). The changes in book value, reduced by the holding gains, produce nominal changes in inventories. The holding gains are derived by multiplying the yearly average book value (the mean of start-of-year and end-of-year inventories) by the rate of change of the relevant annual retail price index for the reporting year. In order to take into account inventories changes among non-reporting entities, these interim results are correct by industry-specific extrapolation factors from the production approach.
- 5.367 With this method, questions arise as to consistency of time and content. In the time dimension it can be assumed that in cases of commercially desirable fast turnaround times at warehouses, a relatively prompt allocation of price indices to the surveyed book value inventories generally approximates to the commercial valuations. As mentioned above, however, it is not possible to reconstruct assumed commercial sequences of consumption procedures (LIFO, FIFO) from survey data.
- 5.368 An accurate allocation of price indices is rendered more difficult by the fact that the cited baseline data available are classified by areas of economic activity and not detailed by product category. This is a problem, particularly in the case of input inventories, because contrary to the case with output inventories, no direct conclusions can be drawn regarding the stored product on the basis of the area of economic activity concerned. In the national accounts this problem is solved by undertaking an industry-specific weighting of the price indices, based on knowledge gained from the input-output accounts, according to the individual input structures of each individual area of economic activity.
- 5.369 Descriptions of the basis for calculation and sources, broken down according to the classifications of areas of economic activity, are listed below. In essence, the procedure for all areas of economic activity is the standard calculation as described above. In those areas in which the necessary book value of inventories can be drawn directly from surveys, the description is limited to the naming of the statistical source.
- 5.370 With some exceptions in the wholesale and retail sector and in some other areas of economic activity, the price data required for the standard approach originate from the production approach and special accounts within the input-output accounts. These are, firstly, the production values of output inventories and goods for resale and, secondly, specially determined input prices of stored materials and supplies. In the following named sources, this indication of the origin of the prices is not repeated again.

Section A Agriculture, hunting and forestry

Changes in inventories in the agriculture sector rely on data from the national agricultural accounts, changes in inventories in the forestry sector on data from the national forestry accounts.

Section B Mining and quarrying

Cost-structure survey of manufacturing, mining and quarrying (EVAS 42251)

Section C Manufacturing

Cost-structure survey of manufacturing, mining and quarrying (EVAS 42251)

Section D Electricity, gas, steam and air conditioning supply

Cost structure survey in the fields of energy supply, water supply, waste water and waste disposal, remediation activities (EVAS 43221)

Section E Water supply; sewerage, waste management and remediation activities

Cost structure survey in the fields of energy supply, water supply, waste water and waste disposal, remediation activities (EVAS 43221)

Section F Construction

Cost structure survey in main construction industry (EVAS 44253).

Section G Wholesale and retail trade; repair of motor vehicles and motorcycles

Annual trade statistics (including motor vehicle maintenance and repair) (EVAS 45341)

Section H Transport and storage

Structural survey in the service sector (SiD, EVAS 47415)

Section I Hotels and restaurants

Annual statistics of accommodation and food service activities (EVAS 45342)

Section J Information and communication

Structural survey in the service sector (SiD, EVAS 47415)

Section K Financial and insurance activities

Data for changes in inventories in the financial sector are made available by the German Raiffeisen Association. Aside from inventories held by the agricultural cooperatives (Hauptgenossenschaften), classified to the banking sector according to their principal economic activity, there are no other inventories to be taken into account in this section.

Section L Real estate activities

Structural survey in the service sector (SiD, EVAS 47415)

Section M Professional, scientific and technical activities

Structural survey in the service sector (SiD, EVAS 47415)

Section N Administrative and support service activities

Structural survey in the service sector (SiD, EVAS 47415)

Section O Public administration and defence; compulsory social security

The German National Petroleum Stockpiling Agency (Erdölbevorratungsverband) provides quarterly internal data for crude oil, motor petroleum, diesel/heating oil and heavy oils regarding tonnages of inventories as well as market prices (EUR/tonne), so that changes in inventories can be calculated directly on a quarterly basis. In view of the availability of physical information, it is unnecessary to estimate the holding gains.

Section S - Other services

Structural survey in the service sector (SiD, EVAS 47415)

5.12 Acquisitions less disposals of valuables

5.371 In Germany, the figures for net acquisitions are calculated in the case of the following goods:

- Gold bars and coins
- New works of art
- Existing works of art
- Jewellery, gems, etc.

a) Gold bars and coins

Household purchases of gold bullion from banks are recorded as acquisitions less disposals of valuables. The data relate only to newly cast gold bars (the 'primary market'), since sales of existing gold bars (the 'secondary market') between households cancel themselves out. Household purchases on the primary market for gold bars are estimated based on adjusted reports from DEGUSSA. They totalled EUR 1000 million in 2010.

The net import of gold coins is also recorded as an acquisition less disposals of valuables; this totalled EUR 381 million in 2010. Imports and exports of gold coins are derived from data in the German Central Bank's balance of payments. In total, acquisitions of gold bars and coins totalled EUR 1381 million in 2010.

b) New works of art

Turnover data from museums and art exhibitions (WZ 92.51.1) drawn from the VAT statistics (EVAS 73311) was used as the basis for evaluating new works of art acquired as valuables within the period of validity of WZ 2003. As it can be assumed that this WZ contains irrelevant turnover data in relation to new works of art on the one hand, but an underestimation can also be assumed on the other hand (such as due to unreported revenue in the event of direct transactions between the artist and purchaser, for example), the turnover data was adopted without any reduction. Since converting to WZ 2008, turnover data for WZ 91.02 has been consulted. Imports of works of art are added to the turnover data of the VAT statistics and exports are subtracted. Information on this is available from the foreign trade statistics (EVAS 51141, 51231).

The valuation for 2010 is as follows (in EUR millions):

Museum turnover as in VAT statistics (WZ 91.02)	518
+ Imports	231
– Exports	520
= Contribution to acquisitions less disposals of valuables	229

c) Existing works of art

For works of art already existing in Germany and sold there, only the actual trade-related services are recorded as the value of acquisitions less disposals of valuables.

The starting point for the calculation is the figures for retail sales of antiques and antique rugs (WZ 47.79.1) and second-hand books (WZ 47.79.2) drawn from the VAT statistics. The figure for trade-related services within the entire turnover of these WZ categories is determined with the help of an estimated trading margin of 20 %. The imports of antiques stated in the foreign trade statistics are then added, and the

exports of valuables are subtracted (in doing so, it is assumed that the import and export of valuables is only concluded by the retail industry.)

By eliminating exports (including of trade-related services), the figure recorded for valuables now only includes the trade-related services for works of art sold inside Germany that were produced in Germany or abroad.

The valuation for 2010 is as follows (in EUR million):

Retail turnover in antiques (WZ 47.79.1) and second-hand books (WZ 47.79.2) as in the VAT statistics.....	476
of which trade-related services 20 %	95
+ Imports	16
– Exports	49
= Contribution to acquisitions less disposals of valuables	62

d) Jewellery, gems, etc.

The data on the output for sale by manufacturing enterprises with 20 or more employees are first taken from the production statistics (EVAS 42131). The production statistics are evaluated at basic prices, i.e. ex-works and exclusive of VAT. The following product categories from the production statistics¹¹² are used:

GP 32.12 "Jewellery, goldsmiths' and silversmiths' wares (excluding imitation jewellery)" whereby some parts belonging to the subgroup "Other wares made from precious metals or plating; wares made from pearls, precious stones, gemstones, synthetic or reconstituted stones" are excluded as they should not be calculated as valuables. Small businesses that do not have report are also included in the estimation. For this the same percentage allowance is used as was found and applied in the input-output account to allow for small businesses in the German classification WZ 32.12 – manufacture of jewellery and related articles.

To find the domestic use of income, the next step involves adding the imports and deducting the exports. The trade-related services (including net taxes on products) are added to the previously determined domestic use of income in order to obtain domestic use of income at purchasers' prices. The trade-related services are determined from the input-output account.

After comparison with data from the microcensus (EVAS 12211) as part of the calculation of household consumption, it was decided that 25 % of domestic use-of-income at purchasers' prices could serve to preserve value. This proportion is correspondingly recorded as access to valuables.

¹¹² Any data on production statistics relate to designations from the currently applicable goods classification for production statistics, 2009 edition (GP 2009).

Calculation method with data for 2010 (in EUR million):

Output destined for sales (production statistics)	467
+ Allowance for small establishments	563
= Domestic output at basic prices	1030
+ Imports	1229
- Exports	875
= Domestic use	1384
+ Trade-related services (including net taxes on products)	1002
= Domestic use at purchasers' prices	2386
of which 25 % = Contribution to acquisitions less disposals of valuables	597

5.372 In summary, the following figures for acquisitions less disposals of valuables are recorded for 2010 (in EUR million):

Gold bars and coins	1381
New works of art	229
+ Existing works of art	62
- Jewellery, gems, etc.	597
= Acquisitions less disposals of valuables	2269

5.13 Balance of exports and imports

5.373 The balance of exports and imports is calculated from the exports minus imports of goods and services, as classified in National Accounts. In accordance with the concepts of ESA 2010, exports and imports of goods and services are presented according to the change of economic ownership principle between resident and non-resident units. Since the foreign trade statistics record all physically incoming and outgoing goods, it is necessary for the presentation of the change of economic ownership to add transactions in which the change in ownership has not led to cross-border movements of goods and to deduct cross-border movements of goods which have not led to a change of economic ownership. For cross-border transactions of goods, results from foreign trade statistics are used; for service transactions between resident and non-resident units, results from the Balance of Payments statistics are used.

5.374 The scope of **foreign trade statistics** is to measure all of Germany's cross-border goods movements to / from other countries, i.e. all physically incoming and outgoing goods as well as electricity are recorded. The foreign trade data are released on a monthly basis. Due to different data collection techniques, the foreign trade statistics differentiate between intra-Community trade statistics ((businesses engaged in foreign trade directly submit their declarations to the Federal Statistical Office) and extra-Community trade statistics (data collection via the customs authorities).

5.375 **Extra-Community trade statistics** cover the cross-border movements of goods between Germany and countries outside the European Union (non-EU countries). The extra-

Community trade statistics are recorded by customs authorities at the time of completing the statutory import or export formalities as part of the ATLAS IT procedure. In the frame of the customs clearance procedure all customs, tax and foreign-trade regulations and statistics formalities are completed. .. The statistical reports are therefore an integral part of the customs declarations and customs authorities check these declarations for completeness and obvious mistakes, and send them to the Federal Statistical Office on a daily basis. The customs formalities have to be completed for any goods that are imported or exported.

5.376 The **intra-Community trade statistics** record Germany's cross-border movements of goods with other European Union (EU) member states. Data collection is based on a collection system where the companies involved report the trade directly to the Federal Statistical Office (Intrastat system). The Intrastat system is, inter alia, characterised by its close link with the VAT system, which provides (indirect) control over the monthly advance VAT declarations that companies have to submit to tax offices. Cross-border transactions of goods have to be registered in the Intrastat system if two conditions are fulfilled:

1. The transactions have to relate to Community goods. In particular, this includes goods that were either produced or manufactured in the EU, or EU duty paid third country goods.
2. The goods were moved between territories of EU member states that also belong to the EU's VAT area.

A reporting obligation is imposed on those companies that are subject to VAT. To reduce the burden of providing information for the reporting companies, a reporting threshold of EUR 500,000 has been set, below which no statistical reporting is required. Values below the reporting threshold are estimated as part of the foreign trade statistics.

5.377 Data on exports and imports of services are taken from the current account balance of the German **balance of payments**. The German Central Bank (Deutsche Bundesbank) produces the balance of payments monthly in accordance with 6th edition of the International Monetary Fund "Balance of Payments and International Investment Position Manual (BPM6)," Regulation (EC) No. 184/2005 and the ECB guideline 23/2011. The results are made available to the Federal Statistical Office for the quarterly calculation of the balance of exports and imports. A direct reporting system is the core source for generating the Balance of Payments payments. Methodically speaking, it is a census with a cut-off threshold (hereinafter referred to as a direct reporting system). All payments between residents and non-residents exceeding EUR 12,500 must be reported if they are not associated with the import and export of goods. Either the resident who ordered the payment or the payment recipient is obliged to report it.

5.378 All monthly received reports are comprehensively checked for completeness and plausibility. The reported figures are published in the corresponding items of the current account balance. Values below the reporting threshold are estimated using a percentage surcharge per country and reporting position.

Table 5–31: Derivation of exports and imports according to national accounts
Year 2010 in EUR (billions)

	Exports	Imports
Goods transactions recorded in the foreign trade statistics (special trade, exports fob, imports cif)	951.960	797.098
– Downward adjustments.....	65.649	76.575
+ Upward adjustments	32.029	36.673
= A. Goods transactions with the rest of the world (National Accounts – exports fob, imports fob).....	918.340	757.196
B. Services as per Balance of Payments and National Accounts (fob, including FISIM)	171.745	198.786
A. + B. = Exports and imports with the rest of the world (National Accounts).....	1 090.085	955.982

5.13.1 Exports of goods

Exports of goods (fob)	2010 (in EUR bn)
Intra-EU	541.552
Extra-EU	376.788
Total.....	918.340

5.379 Foreign trade statistics (special trade concept) by the Federal Statistical Office serve as a basis to determine merchandise trade. Foreign trade statistics covers and accounts for all of Germany's cross-border movements of goods with other countries, i.e. all physically incoming and outgoing goods as well as electricity.

This also includes goods traded free of charge or imported and exported goods owned by foreigners. Processing transactions with cross-border movements of goods are also included. The special trade concept comprises goods imported to Germany for use, final consumption, or which enter the country for inward/after outward processing, and goods exported following production or leaving Germany for/after processing.

5.380 National Accounts are based on the general trade concept, as part of which – in contrast with special trade – the import of goods to (customs) warehouses and the export of goods from (customs) warehouses are included.

The difference lies in proving foreign goods imported into the (customs) warehouse. While general trade encompasses imports of goods into customs warehouses and exports from customs warehouses, special trade only includes imports from customs warehouses into free circulation or for inward processing. Correspondingly, withdrawals from the warehouse in free circulation included in special trade are to be removed according to the concepts of National Accounts.

**Table 5–32: Illustration of upward and downward adjustment positions
for exports of goods**

Year 2010 in EUR (billions)

Item	2010 (in EUR bn)
Export (special trade as per foreign trade statistics) (export fob)	951.960
Upward adjustments	32.029
Exports ex-warehouse.....	4.285
Other allowances for exhaustiveness (exemptions to foreign trade statistics)	1.553
Price increases.....	0.356
Merchanting.....	14.528
Other goods transactions.....	9.128
Goods procured in ports by carriers	0.474
Goods sold to non-residents after outward processing	1.705
Downward adjustments	65.649
Returned goods	7.981
Price reductions	8.455
Leasing	0.684
Processing	48.529
Export of goods as per national accounts (export fob)	918.340

5.381 The individual upward and downward adjustments are explained in more detail below.

a) Upward adjustments

Exhaustiveness

To adjust the data on exports according to the special trade concept, **exports from customs warehouses** are added in line with the general trade concept. The relevant data is collected as part of the foreign trade statistics (exports from customs warehouses and free zones identified by the statistical procedure). Furthermore, the **export of parcels** is also added since parcels are exempted from reporting in the foreign trade statistics. Transactions of **non-monetary gold** are also exempt from being reported in the foreign trade statistics. Information related to this is reported to the German Federal Bank as part of the direct survey process and added to the value of the export trade. Moreover, the **sale of goods by German companies to foreign online retailers operating in Germany** are added.

Price increases

Subsequent price increases of exported goods as a result of contractual agreements, which especially play a role between related companies, are reported to the German Central Bank as part of the direct reporting system and added to the values of foreign trade statistics.

Sales of goods that do not cross German border

Following the concepts of National Accounts and Balance of Payments statistics, the goods transactions must also be recorded if goods do not physically cross borders but where a change of economic ownership between a resident and a non-resident occurs.

On the one hand, this relates to goods that were purchased abroad and then sold on – known as **merchandising**. This includes for example purchasing soya beans in Argentina and reselling these beans directly to Uruguay, or purchasing motor vehicles produced by foreign subsidiaries of German companies and then reselling these vehicles to

foreign distribution companies. The balance of these goods is added to the export goods.

On the other hand, this includes goods that residents sell to non-residents, **without the goods crossing the German borders**. Information relating to the corresponding transactions are reported to the German Central Bank as part of the direct reporting system. The majority of these reports relate to code number 997 as per the directory of services specifications for the Balance of Payments. They are accounted for under the "Other goods transactions" item. In particular, the following items are added to the base figures for the foreign trade statistics:

- Other goods transactions,
- Fuels for transportation,
- On-board catering,
- Domestic goods that are purchased for domestic processing by a non-resident owners
- Goods that are sold abroad after having been processed abroad.

b) Downward adjustments

Price reductions

As with price increases, subsequent price reductions of exported goods are reported to the German Central Bank as part of the direct reporting system and deducted from the value of foreign trade statistics.

Exports of goods without change of ownership

In accordance with section 3.173 e) of ESA 2010, **processing and repair activities** on behalf of non-residents are recorded as services exports. These activities are recorded on a net basis, i.e. excluding the value of the processed or repaired goods. However, as these goods do physically cross borders, they are included in special trade. As a result, goods that are exported for processing, or after processing have to be deducted from foreign trade statistics. This is done by using specific codes (nature of transaction) available from foreign trade data. **Returned goods** are goods that are returned to the originating country due to special circumstances (e.g. due to notice of defects). Since these movements are not a result of genuine market transactions, their value must be deducted from foreign trade statistics, both in respect of the original sale and in respect of the return. These returned goods are recorded in foreign trade statistics under a specific code and can therefore be identified and deducted.

Furthermore, goods temporarily sent abroad as part of an operating lease are deducted since the German lessor continues to be the economic owner of the goods. The values recorded in the foreign trade statistics are identified due to a specific code and are deducted.

5.13.2 Exports of services

Exports of services (fob)	2010 (in EUR bn)
Intra-EU	89.065
Extra-EU	82.680
Total.....	171.745

5.382 The German Central Bank defines and subdivides service transactions in accordance with the specifications in the 6th edition of the International Monetary Fund Balance of Payments and International Investment Position Manual (BPM6), the Manual on

Statistics of International Trade in Services (MSITS 2010) and Regulation (EC) No. 184/2005. The content, data sources and estimation procedures for the 12 main components of the services account are described below.

Table 5–33: Services exports as per main components of the services account
Year 2010 in EUR (billions)

Main components of the services account	
Manufacturing services	4.034
Transport	42.069
Travel	26.159
Insurance and pension services	5.566
Financial services	18.021
Charges for the use of intellectual property	6.226
Maintenance and repair services	2.378
Construction services	-
Telecommunications, computer and information services.....	15.734
Other business services	46.955
Personal, cultural and recreational services	0.85
Governmental services	3.753
Exports of services (= income)	171.745

5.383 The calculation for the individual services positions are explained below:

a) Manufacturing fees

This relates to transactions in conjunction with processing assembly, labelling etc. of goods that are not owned by the enterprise which processes them (contract manufacturer). The fees charged by the contract manufacturer include costs for materials purchased by him.. In contrast, if goods are additionally purchased by the owner (of the processed goods) abroad or the finished goods sold after processing, these transactions are recorded as "Other goods transactions". Manufacturing fees from processing are reported to the German Central Bank as part of the direct reporting system.

b) Transport

Transport services are broken down by what is carried (passenger transport, freight transport, other) and by mode of transport (sea transport, air transport, inland waterway transport, road transport, rail transport, postal and courier transport, pipeline transport and electricity transmission, space transport and other transport. Passenger transport and other transport are reported to the German Central Bank as part of the direct reporting system. Due to the different methods for calculating the value of goods in foreign trade statistics and Balance of Payments payments, freight transport must be partly estimated (see 5.13.3 b)).

c) Travel

Travel credits include all expenses incurred by foreign travellers in Germany for goods and services that the traveller purchases in Germany for own use and consumption. This also includes payments for transportation within Germany, whereas expenses for flights, rail travel or sea voyages to Germany (and the return journey) are not included. Travel credits are calculated based on bank settlements and credit card company statements that process a large proportion of the travel transactions, as well as the buying and selling of foreign currency.

d) Insurance services

Insurance services are divided into the following categories: transport insurance, life insurance, other direct insurance, reinsurance and auxiliary insurance services. The service that insurers provide for their policyholder is partly financed by premiums, i.e. it is not a transaction that can be obtained from the market. For this reason, insurance services are estimated using data from the insurance supervisory authority in conjunction with directly reported values. Insurance services yield the premiums earned (plus premium supplements) minus claims expected in the long term (for further information on calculating insurance companies' value added, see section 3.17).

e) Financial services

Fees for explicitly invoiced financial services, e.g. account management fees and brokerage commissions, are reported to the German Central Bank as part of the direct reporting system. Non-explicitly invoiced financial services that are expressed in the interest rate differential between debit interest and credit interest are calculated by the Federal Statistical Office as Financial Intermediation Services Indirectly Measured (FISIM) (the calculation is explained in detail in section 3.17.1) and is made available to the German Central Bank for the Balance of Payments payments.

f) Charges for the use of intellectual property

Fees for the distribution of software, audio-visual media and the use of patents and trademarks are reported to the German Central Bank as part of the direct reporting system. This includes distribution rights for computer programs, films or music, as well as using patented research results or brand logos in products.

g) Maintenance and repair services

Fees for the maintenance (ensuring the target state) and repair (re-establishing the target state) of goods, including the materials used, are reported to the German Central Bank as part of the direct reporting system.

h) Construction services

Income and expenditures for construction of plants, buildings and civil engineering abroad that take less than one year to complete are reported to the German Central Bank as part of the direct reporting system. For years preceding 2014, it is assumed that building works carried out by German firms abroad have been ongoing for longer than one year and are therefore to be considered as direct investments. Profits from direct investments are documented as an integral part of the cross-border primary income (for more information, see sections 8.4.2.2 and 8.4.3).

i) Telecommunications, computer and information services

Fees for communication services, IT services, the use and sale of software, messaging and information services, and other information services are reported to the German Central Bank as part of the direct reporting system. This includes telephone charges, installing and maintaining data centres, data storage and providing messages.

j) Other business services

This includes – but is not limited to – provision of customer-specific and non-customer-specific research and development (R&D), the sale of protected rights from R&D, R&D services (excluding systematic research to expand the knowledge base), legal-advice, accounting, auditing, bookkeeping and tax-consultancy services, management-consultancy and public-relations services, advertising, market-research and survey services, architectural services, engineering services, scientific and other services, services for the removal of waste and harmful substances, agricultural and

mining services, leasing, trade-related services and other business services. All these services are reported to the German Central Bank as part of the direct reporting system.

k) Personal services

Personal services include inter alia audiovisual and associated services, audiovisual templates, health services, training services, cultural heritage and leisure services, and other personal services. These services are reported to the German Central Bank as part of the direct reporting system.

l) Government services

This position includes transactions of German enclaves abroad like embassies or armed forces stationed abroad. They are reported to the German Central Bank as part of the direct reporting system. Reimbursement of collection costs for customs and income from international organisations is taken from administrative sources. Consumption spending of foreign armed forces based in Germany is estimated according to the propensity to consume of the soldiers' estimated total available income.

5.13.3 Imports of goods

Imports of goods (fob)	2010 (in EUR bn)
Intra-EU	422.342
Extra-EU	334.854
Total	757.196

- 5.384 Foreign trade statistics data on special trade by the Federal Statistics Office serves as a basis for determining the import of goods. For the content of foreign trade statistics content and conceptual differences between foreign trade statistics and National Accounts, see Section 5.13.1.
- 5.385 Considering that foreign trade statistics focus only on goods which physically cross the border, it only partially reflects the total sales/purchases of goods taking place between residents and non-residents which must be accounted according the concepts of National Accounts or Balance of Payment. Imports of foreign trade statistics disregard all transactions where a change of economic ownership between a resident and a non-resident takes place, but where the corresponding goods are not physically imported to Germany For this reason, the imports and exports of goods in the National Accounts or the Balance of Payment are not accounted for on a basis of cross border transactions, but on the change of economic ownership residents and non-residents.
- 5.386 Therefore, in order to represent imported goods based on the change of ownership principle, it's necessary to adjust foreign trade statistics and add all imported goods that residents purchase from non-residents, but do not cross national borders, and deduct all goods that have entered the country physically, but remain in the ownership of a non-resident.

Table 5–34: Illustration of upward and downward adjustment positions for imports of goods

Year 2010 in EUR billion

Item	
Import (special trade as per foreign trade statistics) (import cif)	797.098
Upward adjustments	36.673
Imports to warehouse	3.776
Other surcharges for completeness (exemptions from foreign trade statistics).....	2.955
Drug trafficking and smuggling	0.734
Price increases	0.143
Other goods transaction (as per BoP)	15.092
Ships' and aircraft stores.....	6.378
Merchanting	2.510
Goods sold to residents after inward processing	5.085
Downward adjustments.....	76.575
Price reductions.....	1.382
Processing.....	50.838
Returned goods	7.981
Leasing	1.462
Freight and insurance	14.912
Imports of goods as per National Accounts (import fob.).....	757.196

5.387 The individual upward and downward adjustments are explained in more detail below.

a) Upward adjustments

Exhaustiveness

In order to align special trade with total import of goods, **imports into (customs) warehouses** on domestic accounts are added to special trade. Furthermore, **imports of parcels, books and magazines** are estimated, as they are not recorded at all or incompletely recorded in the foreign trade statistics. Furthermore, imports of **non-monetary gold** are added to the foreign trade statistics results if the change of ownership is not followed by an import. Information on these transactions is reported to the German Central Bank as part of the direct reporting system. Likewise, purchases of goods of German economic entities from foreign **online traders** operating in Germany and the **import values for drugs and smuggled cigarettes** (for calculation see Chapter 7.1) are estimated and added to foreign trade statistics results.

Price increases

Subsequent price increases of imported goods as a result of contractual agreements, which play a role especially between related companies, are reported to the German Central Bank as part of the direct reporting system and added to the values of foreign trade statistics.

Sales of goods that do not cross German border

Payments due to these sales are reported to the German Central Bank as part of the direct reporting system. Analogously to exports, this relates to the following items:

- Merchanting
- Other goods transactions
- Fuels for transportation
- On-board catering

- Special tools purchased abroad and used there for production, but that remain the property of a resident
- Goods that are purchased for processing abroad by a resident owner
- Goods that are being bought domestically after inward processing

b) Downward adjustments

Price reductions

In the same way as with price increases, subsequent price decreases to imported goods are reported to the German Central Bank as part of the direct reporting system and deducted from the foreign trade values.

Imports of goods without change of ownership

Goods, which have been imported again after outward **processing** or those that are being imported for inward processing, as well as **returned goods** and **goods leased** are identified and deducted from special trade using additional information provided by foreign trade statistics.

Valuation

Foreign trade statistics record the goods' value at the German border, Balance of Payments records the goods' value at the border of the exporting economy. Therefore, the valuation is identical for exports, but for the imports the value of imported goods in the foreign trade statistics has to be adjusted by eliminating the **transport costs between the border of the exporting economy and the German border**. The transport costs from the border of the exporting economy to the German border are estimated and deducted from the goods' value. The costs are estimated depending on the mode of transport, the exporting economy and the type of goods being transported. Transport costs determined in this way are recorded as a service if the transport company is non-resident (see 5.12 2 b) and 5.13 4 b)).

5.13.4 Imports of services

Imports of services (fob)	2010 (in EUR bn)
Intra-EU	113.237
Extra-EU	85.549
Total.....	198.786

5.388 In principle, determining the imports of services is done in exactly the same way as the exports of services. Only travel needs a different approach. Therefore, the following explicit explanation is focused exclusively on differing approaches or data sources; please refer to exports explanations for any other items.

Table 5–35: Services imports as per main components of the services account
Year 2010 in EUR (billions)

Main components of the services account	
Manufacturing services	2.964
Transport.....	50.450
Travel	58.934
Insurance and pension services	2.482
Financial services	8.826
Charges for the use of intellectual property	5.355
Maintenance and repair services.....	0.855
Construction services	-
Telecommunications, computer and information services.....	15.063
Other business services	50.867
Personal, cultural and recreational services	2.100
Government services	0.890
Service imports (= expenses)	198.786

a) Manufacturing fees

See 5.13.2 a)

b) Transport

See 5.13.2 b)

c) Travel

Travel expenses include all expenses of resident travellers abroad for goods and services, for personal use and consumption. Travel statistics only record payments that have taken place for transportation in the destination country, whilst expenses for flights, rail or water transport to the destination country (and the return journey) are not included. Since 2001, the calculation for the travel debit data is based on the results from a household survey which refers to the population of the Federal Republic of Germany

d) Insurance and pension services

See 5.13.2 d)

e) Financial services

See 5.13.2 e)

f) Charges for the use of intellectual property

See 5.13.2 f)

g) Maintenance and repair services

See 5.13.2 g)

h) Construction services

See 5.13.2 h)

i) Telecommunications, computer and information services

See 5.13.2 i)

j) Other business services

See 5.13.2 j)

k) Personal, cultural and recreational services

See 5.13.2 k)

l) Government services

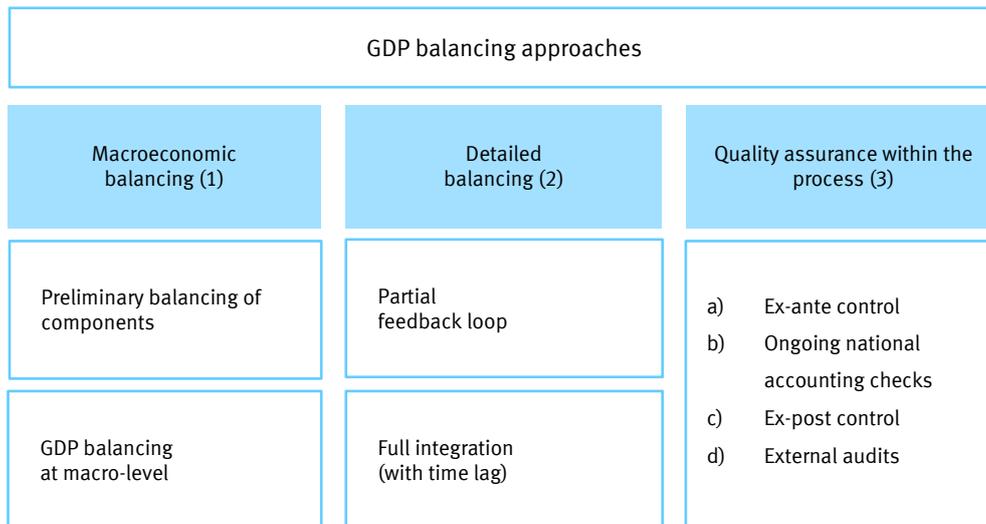
See 5.13.2 l)

Chapter 6 GDP balancing within the accounting system and validation methods

6.1 GDP balancing procedure within the accounting system

- 6.01 GDP is calculated in Germany in two separate ways: in the production approach GDP is calculated using producers' gross value added and net taxes on products, whilst in the expenditure approach the GDP is calculated as the sum of consumption expenditure, fixed capital formation and the balance of exports and imports. In both approaches, the calculations are performed in a largely autonomous way and are joined in a macroeconomic balancing process. In Germany, it is not really possible to calculate GDP in a third way on the distribution side (income approach) because of the large gaps in information about entrepreneurial income. However, the results from the income approach are used to validate the GDP, e.g. by calculating specific macroeconomic indicators.
- 6.02 The balancing and validation of GDP calculations can generally be subdivided into three major blocks:
- (1) Macroeconomic balancing
 - (2) Detailed balancing
 - (3) Quality assurance during the process
- 6.03 These approaches are shown with their overall context in Figure 6–1 below. A partial reconciliation of components preceding the actual macroeconomic balancing is included in the calculation process. Aggregates which are particularly statistically closely related to each other are checked for coherence prior to GDP balancing. Some examples are the reconciliation of the calculation of gross fixed capital formation on buildings and structures with the output of the construction industry or the comparison of source data for retail trade used to calculate the household final consumption expenditure with source data for retail trade used to calculate the output of the retail trade industry in the production approach.
- 6.04 The following **macroeconomic balancing** procedure serves to verify the results of the largely independently calculated GDP in the production and in the expenditure approaches and to combine them in a macroeconomic system. This procedure is performed separately in each calculation of GDP, starting with the first provisional quarterly GDP calculations (t+45 days after quarter end) and/or the first provisional annual calculation in January of the following year, via the regular more in-depth annual calculations (for the first time after t+18 months) until the major national accounts revisions and back-casting which are carried out at intervals of several years and are mostly used also to ameliorate the calculation methods. During these calculation cycles the statistical data become ever more dense and the quality of the national accounts figures is progressively improved.

Figure 6–1: The system of GDP balancing



- 6.05 **Detailed** balancing (phase 2) is a further approach which involves integration of the GDP and the input-output calculation. Based on supply and use tables, a reconciliation is made on a detailed level of product supplies (domestic production and imports) and of product use (final demand and intermediate consumption). If the detailed balancing reveals that the needed corrections in specific groups of products or industries cannot be done within the sums of data by columns and rows, which are the results of the previous macro-balancing, these results may be changed in another round of the macro-balancing procedure. Full integration of the input-output compilation was formerly only possible in the context of national accounts revisions at intervals of several years, because the tables were available only with a large time lag. As a result of a speeded up input-output compilation, which occurred in the last years, it is now possible to partially integrate the input output accounts into the final annual GDP calculations. Nonetheless, there is currently a time lag for this integration of around 3 to 4 years (e.g. the IOA for the reporting year 2011 could be integrated only in Summer 2015). Full integration without a time lag is not possible because of the data situation and the complex calculations involved in the process of input-output compilations.
- 6.06 In addition to these two balancing approaches of the GDP, there is a whole range of further measures designed to provide accompanying quality assurance for the calculations (phase 3), which are outlined in detail in section 6.2.

6.1.1 GDP balancing at macro-level

- 6.07 The practice of macroeconomic GDP balancing consists in a systematic, multi-stage, iterative procedure, where a number of national accounts experts establish in an interactive process an optimised result with respect to a whole series of various indicators. Thus, this is not an automatic process or a predetermined sequence of mathematical steps. The balancing process can be broken down into the following steps:
- (1) Its starting point lies in the results of the calculations in the production and expenditure approach (annual and quarterly results, at current prices and with adjusted prices).
 - (2) Identification and checking of existing deviations
 - (3) Analysis of results over several years (time series)

- (4) Comparison of 'new' and 'old' results (from the previous computation)
 - (5) Comparison of provisional and final results (from previous years)
 - (6) First feedback loop/verification of 'weak' and less reliable aggregates
 - (7) Plausibility check on changes in inventories (after the first balancing round)
 - (8) Plausibility check on implicit deflators (after the first balancing round, for GDP, aggregates of the expenditure and of the production approach)
 - (9) Feedback loop with (provisional) seasonally- and calendar-adjusted results
 - (10) Feedback loop with results of income approach (e.g. operating surplus, labour share in national income, saving ratio)
 - (11) Analysis of other macroeconomic indicators (productivity, unit labour costs)
 - (12) Feedback loop with results of sector accounts (in particular coherence)
 - (13) Analysis of balancing differences in the time series
 - (14) Breakdown of balancing differences (published values) primarily by arithmetical methods (with subsequent plausibility checks, particularly of the time series)
 - (15) Comparison with the results of other external institutions
 - (16) Discussion and feedback from external national accounts experts (or, particularly in the case of seasonally and calendar-adjusted results, experts from the Deutsche Bundesbank).
- 6.08 Logically, the balanced GDP lies in the interval between the calculated results according to the production approach on the one hand and the expenditure approach on the other; that applies for both the absolute value and the rates of change. In a long-term perspective from 1991 to 2013, the results according to the expenditure approach are around 1.2% above the production approach. In terms of balanced GDP, the balancing adjusts the production approach results by an average of 0.8 percentage points (upwards) and the expenditure approach results by 0.4 percentage points (downwards). In most years, the balancing constellation shows a similar pattern and the balancing differences of the past years have been of similar magnitudes. However, in the years following the financial crisis in 2009, a significant increase could be observed in discrepancies between the production and expenditure approaches, the cause of which have not yet been explicitly clarified. This phenomenon may be connected with increasing globalisation and an inadequate record of cross-border transactions within the scope of Internet trade.
- 6.09 The notable higher upwards balancing of the production approach results is due to the fact that, despite numerous allowances for exhaustiveness, there is still a possibility for certain figures to be underestimated in the production approach. This particularly applies in cases where VAT has been charged but has not been transferred to the fiscal authorities. The figures for gross value added and the recorded taxes on products, and therefore also the GDP calculated in the production approach, could be too low by these amounts. An obvious upward adjustment is made to compensate for this.
- 6.10 Reference points for adjusting the results calculated in the expenditure approach downwards come mainly from the analysis of asymmetries in the foreign trade. By replacing data on German imports with the exports of the partner countries, which is the basic idea of the inflow procedure in the EU-intra trade, the German net export and ceteris paribus the GDP would be lower. However, as the common practice in the German National Accounts is to stick to the official results of the foreign trade statistics and the balance of payment statistics, the needed downwards balancing adjustment is spread across other expenditure aggregates. First, the changes in inventories is considered, because the statistical basis for this item is seen as comparably weak. The household final consumption expenditure is also included in the balancing procedure, although to a comparably lower extent. However, government final consumption expenditure is excluded from the balancing procedure (also to avoid affecting the

government's sensitive indicator net lending/net borrowing) and also the gross fixed capital formation.

- 6.11 In breaking down the balancing adjustments by industries in the production approach, the initial structure of the gross value added (by industries) remains unaltered. Thus, it is the gross value added by industries which is adjusted. In doing so, the output remains normally unchanged (because of the better statistical basis) and the balancing entry is recorded under intermediate consumption. In this procedure, a few of the accounting categories are left out of the balancing process (e.g. sectors S.13 General Government, S.15 Non-profit institutions and S.12 Financial corporations), because either the respective results are considered to be particularly robust or they are already being processed elsewhere in other subsystems (sector accounts). A final check of these balancing entries is made in the next revision (one year later), based on the detailed supply and use tables (see section 6.1.2).

6.1.2 Detailed balancing within the supply and use tables

- 6.12 In Germany, in terms of organisation and assigned resources, the calculation of the gross domestic product (quarterly and annually) in the production and in the expenditure approaches is carried out separately from the calculation of annual supply and use tables. In principle, the calculations by product in the supply and use tables are done downstream. The insights gained in calculating the supply and use tables are incorporated into the production and expenditure approaches to GDP with time-lag.
- 6.13 Supply and use tables have been calculated for almost all reporting years since 1991. Tables in line with the new concepts of the ESA 2010 are available for 2010 and 2011, which is in compliance with the ESA delivery programme. These tables are fully congruent with the national accounts calculations as per August 2014 and are therefore not always directly comparable with other tables. For the reporting year 2012, supply and use tables are provided up to the end of December 2015 (calculation status August 2015).
- 6.14 Therefore, starting point for the computation of supply and use tables are provisionally balanced results for the output and GDP expenditure. Any inconsistencies revealed in the course of calculations by products for the supply and use tables, would be corrected in the next revision of the output and GDP expenditure – this is therefore an integration with time-lag.
- 6.15 The output table and the use table at basic prices are currently calculated by 2600 product groups and 64 industries. The passage from the use table at basic prices to the use table at purchasers' prices is made in a break down by 85 product groups and 64 industries, which is also the aggregation level in which the tables are balanced and published at national level. For Eurostat, the tables are aggregated by 64 product groups and 64 industries, which is according to the ESA delivery programme.

- 6.16 Existing identities between the industries and product groups as presented in the supply and use tables are used for checking the consistency and improving the estimations.
- **Identities by industries:**
The output by industry matches the total input by industry. For each industry:

$$\text{output} = \text{intermediate consumption} + \text{gross value added}$$
 - **Identities by product groups:**
The supply of products equals the use of products. The total supply by product group at purchasers' prices is equal to the total use of products by product groups at purchasers' prices. For each product group,

$$\begin{aligned} & \text{Output at basic prices} \\ & + \text{Imports (cif)} \\ & + \text{Trade and transport margins} \\ & + \text{Taxes less subsidies on products} \\ & = \text{Supply of products at purchasers' prices} \\ & \text{Intermediate consumption at purchasers' prices} \\ & + \text{Final consumption expenditure} \\ & + \text{Gross capital formation} \\ & + \text{Changes in inventories} \\ & + \text{Exports (FOB)} \\ & = \text{Use of products at purchasers' prices} \end{aligned}$$
- 6.17 To break down domestic output by products, the same sources and calculation basis are used as for the calculation of output by 64 industries. In addition, the following statistics play an important role:
- Evaluation of production statistics by products and industries (EVAS 42131)
 - Survey on materials and goods received (every four year) (EVAS 42241)
 - Foreign trade statistics (EVAS 81411)
 - Balance of payments statistics (EVAS 83111)
- 6.18 These sources are used as basis for analyses of additional information and of further calculations as well as to make a first breakdown by product group. The output is broken down by products according to a very detailed classification: The Systematic Product Classification for Input-Output-Calculations (SIO), which allows to assign existing data to products as accurate as possible and to close any data gaps by careful considerations on a deep level of detail.
- 6.19 The essential **steps** in the calculation of output by products are:
- considering of differences in the concepts of various data sources and harmonising them to fit in with the general data,
 - fitting data to comply with the concepts of the system of national accounts and reconciliation them with the national accounts data - for instance, reducing turnover in trade by the value of goods for resale or the passage from valuation at ex-works prices to valuation at basic prices.

- passage from industries to homogenous branches. The statistical unit underlying the above mentioned calculations is the enterprise (in the sense of the smallest legal unit), which is assigned to an industry according to its main activity. To obtain the output by homogenous branches from these data, the secondary activities have to be identified and conveyed to the branches characteristic of them. The particular activities and their extent are shown in the output breakdown by products.
- 6.20 To calculate the supply of goods and services (product supply) it is necessary to distinguish between **domestic supply** and **imports**, both in the breakdown by products. The aim of the calculation is to achieve a compilation by a harmonised product classification.
- 6.21 The calculation of the use of each product is carried out row-by-row in a detailed breakdown (around 2 600 eight-digit items of the SIO). The results are then aggregated to present the supply and use by 64 industries and 85 product groups.
- 6.22 The following industries require special attention when balancing the use table at purchasers' prices.
- 35.1+3 Electricity, heating and cooling supplies
 - 26 Manufacture of computer, electronic and optical products
 - 50 Water transport
 - 51 Air transport
 - 84.1+2 Public administration and defence
- 6.23 As regards the product groups, particular balancing difficulties are encountered in following groups:
- 50 Water transport services
 - 38 Waste collection, treatment and disposal activities, materials recovery
 - 30 Manufacture of transport equipment not elsewhere classified
 - 21 Pharmaceutical products
- The reconciliation of lines usually takes priority over the reconciliation of columns.
- 6.24 When determining the intermediate consumption at basic prices, in most cases specific analysis and adjustments are carried out until the difference between the resulting intermediate consumption by industries and the preliminary balanced intermediate consumption is less than 10% and lower than 1 billion EUR. Differences beneath these levels are distributed using the automatic total-sums-reconciliation.
- 6.25 For each reporting year, Excel files with data before and after balancing are saved separately. When calculating a new reporting year, the use structures of the last reporting year (before reconciliation) by 2600 product groups and 64 industries are used as a starting point for the work. Nonrecurring balancing adjustments are assessed as special statistical problems, while recurring or similar adjustments over several years will lead to thorough revisions of the product structures in major reviews. These findings may then also be taken into account in other parts of the national accounts calculations and may also affect the gross domestic product.

6.2 Other approaches to validating GDP

- 6.26 The procedure of balancing of the gross domestic product may be considered essential to a comprehensive system of in-process **quality assurance** of national accounts. Figure 6-3 below gives an overview over the most important elements of this quality assurance approach.

There are following distinct stages:

- a) Ex-ante verification (in the source statistics)
- b) Ongoing checks (of the results) in the national accounts
- c) Ex-post national accounts examinations (concerning the methods used)
- d) External checks and consultations.

a) Ex-ante verification

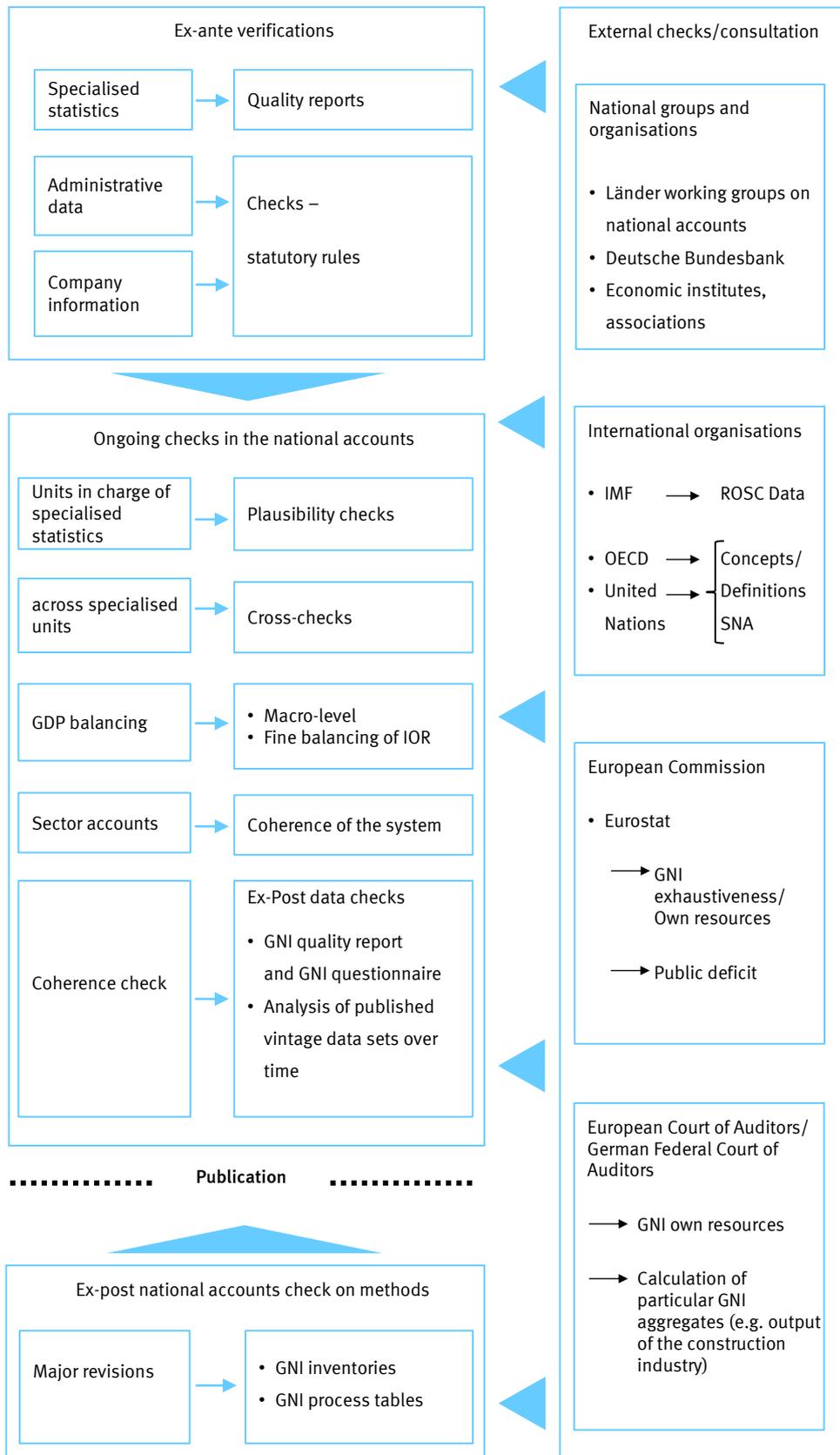
- (1) Quality checks of basis data from specialised statistics

Before the actual national accounts calculations can start, a series of quality checks must be performed, most of which will have already been made by those supplying the source statistics. In the system of national accounts, the results of a wide range of primary and secondary surveys are processed as well as information from other administrative data sources. If the basis data stem from specialised statistics delivered by official national statistics producers, the results of the quality test are regularly documented in the respective standardised and continuously updated quality reports. Since December 2005, quality reports have been produced for almost all the official statistics (approximately 230 reports, including reports for the national accounts and for the employment account). These are normally parts of the publications presenting the statistical data.

- (2) Cooperation between units in charge of specialised statistics and the national accounts

To calculate the national accounts figures, all suitable data are used that are present on the particular publishing or revision date. This includes current economic surveys, administrative data, household surveys and business statistics, the annual accounts of large enterprises and information obtained from specific associations. In cases of internal sources, i.e. of the statistics produced by the Federal Statistical Office, this takes place in a bilateral contact between the technical units in charge within the national accounts and those within the specialised statistics departments. As part of meetings held with working parties on special statistics, matters concerning content and timetable of national accounts are also discussed.

Figure 6–3: Quality assurance in the German system of national accounts



(3) Timing the Schedule

The publication schedule which can be found on the Internet and the timetables for publication of the source statistics show the compilers of the German national accounts when basis data will be updated (see www.destatis.de/PressServices). As soon as the national accounts units have received press releases pertinent to their responsibility field (automatically via email or the Intranet), they are able to access the underlying detailed data sets (Genesis database of the Federal Statistical Office). For external statistical sources, the specialised units are also largely kept informed by the producers of such statistics, or data are sent automatically according to appropriate agreements.

(4) Monitoring adherence to schedules of specialised statistics

To verify that the official statistics are prepared on time, there is a special database-supported monitoring process (TeCon) available for internal control. It keeps track of the schedules for all the official statistics at the Federal Statistical Office and of deliveries from the regional statistical offices. Punctuality is documented in regular control reports. Any critical delays to the schedules are regularly discussed at management level at the Federal Statistical Office and improvements are induced.

(5) Documentation

The units in charge for calculations keep records of all the data sources that are integrated into the calculations. These tables are updated regularly and checked at all scheduled target dates for compilations.. In the 2004 annual report of the European Court of Auditors, it was found (paragraph 3.48, b) that the “existence of agreements or equivalent arrangements between National Accounts departments and units providing basic statistical data, which set out the conditions for the delivery and the quality of data” is a given in Germany. The results which ultimately flow into the final calculation of GDP are documented particularly thoroughly. As well as this, important ad-hoc decisions are recorded in separate notes and memoranda.

b) Ongoing checks in the national accounts

(6) Scheduling National accounts compilations

Within the scope of national accounts, all target dates (compilation deadlines, internal delivery dates, reconciliation deadlines and publication dates) are already set each year in December for the following year. By this means, all the employees of a department will know exactly the date by which they have to complete the quarterly and annual accounts for their areas of expertise for delivery to other specialist units of the department for further processing. The employees who are responsible for particular accounting areas are also in direct personal contact with each other and if necessary ad-hoc meetings are conducted at the working level and documented where necessary.

(7) Monitoring adherence to schedules of national accounts compilations

A particular unit is responsible for monitoring the internal deadlines within the national accounts system, and the same unit also prepares data for the reconciliation and publication of the GDP. It ensures that downwards calculations are completed in time and that the delivery and publication deadlines are kept. The deliveries from the specialised units are documented in electric form to show for each one the date and time they occurred. In addition, there is another separate coordination for the input-output-calculation, which is supplemented by a monthly team meeting.

(8) Quality control in national accounts units

During the compilation process of the national accounts aggregates, quality control checks are constantly being conducted, a synopsis of which is shown in Figure 6-3. Here the basis data are checked for plausibility and then compared with data from other available sources. Discussions with other specialist units and/or departments are held in order to clear up possible discrepancies and ultimately to reach the appropriate result. Where necessary, the individual basis data must be adapted to fit the national accounts concepts, which in turn requires a thorough consultation of the data material.

(9) Crosschecks national accounts - employment account

The results of the employments account open the way for an important transversal sectional checks by industries (also see Chapter 7). The employment account, which is fed from numerous, regular, often monthly sources, deliver to the respective specialist units an additional means of control, particularly in relation to developments in the particular industries and by sectors. Conclusions can be drawn about the plausibility of statistics in the overall context from a comparison of the results of the employment account with the results of particular specialised statistics. The figures from the employment account also are an important basis for the work of the transversal working group on coherence in the German national accounts ("Kohärenz (VGR)").

(10) Monitoring the exhaustiveness of the national accounts

Part of the transversal sectional control checks are all the activities carried out in relation with the exhaustiveness check of the gross national income (GNI) for purposes of the EU own-resources. This refers in particular to the reconciliation of consumption expenditure (national accounts) with the results of household surveys (Sample Surveys on household income and expenditure) (see also Chapter 7).

(11) GDP balancing at macro-level (see section 6.1.1).

(12) Detailed balancing of GDP (see section 6.1.2).

(13) Quality check by means of sector accounts

After the (provisional) GDP balancing, a further check takes place during the process of the sector accounts compilations in view of the full system coherence. This is a check entailing an analysis of whether the macro-economic circuit is complete and consistent - in other words, whether the production approach, expenditure approach, income approach and financial account in the various sectors of the economy are congruent with each other. A few days after the first reconciliation, the unit responsible for compiling the sector accounts set up a complete set of sector accounts with the data records produced by other national accounts units. The sector accounts for S.12 (financial corporations), S.13 (general government) and S.2 (rest of world) are delivered entirely by other units in the National Accounts department. The remaining sectors S.11 (non-financial corporations and quasi-corporations) and S.14/15 (households and non-profit institutions serving households) are calculated from the existing modules, and partly also by means of mirror comparisons. The examination for exhaustiveness, consistency and plausibility of the sector accounts involves the use of very complex and highly detailed control tables in which the coherence of the particular account items used by the various specialist units is investigated. Any differences revealed are reported to the responsible specialist units, discussed and corrected immediately.

(14) Quality check of national accounts/financial account

In addition to the internal checks for the sector accounts, at each scheduled target date for the national accounts there is a reconciliation and coherence check against

the financial account prepared by the Deutsche Bundesbank. Issues related to the sector allocation are cleared up and, as far as possible, financial balances are reconciled by sectors. Differences between the financial balances in the financial account and in the non-financial sector accounts remain in the sector rest of the world (S.2) because of non-assignable residual items in the balance-of-payments statistics; the offset entries are recorded in the non-financial corporations sector (S.11). Apart from different vintages, the financial balances of S.12, S.13 and S.14/15 are congruent.

(15) Working group on coherence of the national accounts (Arbeitsgruppe Kohärenz (VGR))

A separate transversal working group entitled 'Kohärenz (VGR)', which was set up at the time when the the major national accounts revision of 2005 was on-going, makes a detailed examination of the provisionally reconciled results. Its function is to check all the important national accounts aggregates by industry (in the NACE special aggregation level A*64) from output to net operating surplus for coherence within the national accounts over time. Various indicators are calculated and checked for all industries and aggregates. In particular, any jumps in the time series are more in-depth analysed.

(16) Quality control on 'productivity'

In addition to the verification program of the 'Kohärenz (VGR)' working group, there is one more in-depth analysis of productivity indicators, such as gross value added per employee and per hour worked, or unit labour costs. As a supplement to this, the ratios for capital productivity and capital intensity allow for good analytical cross-checking for the results by industry.

c) Ex-post verification of the compilation methods in the national accounts

(17) GNI questionnaire

A further check is carried out after publication of the results when completing the GNI questionnaire and preparing the annual quality report on the GNI data. These two documents are prepared for purposes of the GNI own-resources and are submitted to the EU Commission (Eurostat). Responsible for this work are people who are not directly involved in the regular calculations, so they can view the results from a different perspective to some extent. Whilst with the aid of the GNI questionnaire once again the congruence of the components of the gross national income is checked, it is the GNI quality report that provides information on the reasons for any changes due to the data revision.

(18) Analysis of vintage data sets over time

Parallel to the preparation of the quality report on the GNI data, complex ex-post control tables are prepared in which the published results in absolute terms and the rates of change of the quarterly and annual GDP and GNI are updated over long time series and documented. There are also comparisons of vintages for all important national accounting accounts aggregates, which are equally documented. These control tables are updated at every compilation date and they are made available internally for information and discussion purposes. In this context, it should be pointed out the publicly available "real-time database" of the German Central Bank (Deutsche Bundesbank)..

(19) Inventories

In addition, as part of major revisions, descriptions of the compiling methods in the national accounts are updated in accordance with standard EU rules, and other

fundamental ex-post control checks of the methods are conducted at regular intervals by the preparation of 'GNI process tables'. These GNI process tables help to ensure that data sources are thoroughly documented at longer intervals in line with a system that is standardised throughout the EU. These standardised inventories provide a further basic ex-post control check of the national accounts methods at regular intervals.

d) External checks and consultations

(20) Feedback from the regional accounts

In Germany, the national accounts working group of the Länder is responsible for calculations below national (geographical) level; nonetheless this indirectly allows checking the GDP results and feedback at national level. The national results for the various GDP aggregates are verified as far as possible using the results from the Länder. In the process of adjusting the Länder results to the national figures (coordination), discrepancies can be checked and a possible need for changes may become apparent. Necessary corrections can then be taken into account at the next scheduled compilation date for the national accounts.

(21) Feedback from the Deutsche Bundesbank

The Deutsche Bundesbank is an important external partner for the Federal Statistical Office in relation with the compilation of the national accounts. On the one hand, the Deutsche Bundesbank provides important components for the system of national accounts with the results of the balance-of-payments statistics and of the financial account, which necessitates a permanent intensive discussion process between the two institutions. In addition, through the close cooperation in the calculations of seasonal adjustment of the national accounts results, the Deutsche Bundesbank offers further points for the examination and checking for plausibility of the national accounts data.

(22) Indirect verifications

Research institutions, ministries and the broad expert community undertake an indirect external verification and checkings for plausibility of the official national accounts results. More or less intensively and regularly, they follow the vintages of national accounts results and examine the quality and efficiency of their econometric models by comparison with the official results. Here too, there is an intensive exchange of experience, either through direct bilateral contacts or in particular discussion groups. In particular, the official expert committee for national accounts, which meets at intervals of several years, is an important platform for exchanging information and experiences between the Federal Statistical Office and external users of national accounts data. On the part of the Federal Statistical Office, great care is taken with respect to all contacts, in order to ensure that independence and objectiveness of the official statistics are not impaired.

(23) European Commission verifications

In an international context, the European Commission (Eurostat) regularly verifies, in the frame of GNI own-resources controls, whether the mandatory stipulated definitions and concepts of ESA are adhered to, and that the methods and results are comparable and exhaustive. In case, disparities or shortcomings are found, Eurostat place (general or special) reservations, which have to be dealt with within a particular time limit. Since the start of the calculation of the EU's own resources on the basis of national accounts results (in 1988 for the first time) there have been numerous more or less complex procedures which have significantly improved the quality and international comparability of the national accounts data. Additionally, in this context it should be

pointed out to the verification of the calculations for the EU value added tax own-resources, which also involves the national accounts. Particularly intensive verifications take place for some years in the field of public finances, as part of the "Excessive Deficit Procedure" (EDP), which do not just affect the general government sector, but often all of the entire national accounts. Last but not least, it is also important to mention the numerous quality assurance activities brought about by the "Committee on Monetary, Financial and Balance of Payment Statistics". This working body represents to a certain extent the interface between the two statistical systems existing in Europe, namely the European Statistical System (ESS) of the national statistical institutes and the "European Statistical System of Central Banks" (ESCB).

(24) Verifications by the European Court of Auditors (ECA)

For a number of years, the European Court of Auditors (ECA) has also been getting involved with checking the national accounts calculations of EU member states as part of the calculation of GNI own-resources. If nothing else, a specific approach for this is the "verification of the inspectors", i.e. the Court of Auditors checking the efficiency of GNI checks through the EU Commission (Eurostat). The German GNI calculation was verified by the ECA in 2012, and before that in 2006 and 2004. The results of the Court's checks are documented and, in some cases, also published.¹¹³ These checks are generally also closely observed by the (German) Federal Audit Office (Bundesrechnungshof).

(25) Verification by the OECD

Although the OECD does not perform any direct checks on the national account results, it does also deal with the quality of national accounts and investigates specific issues related to international comparisons.¹¹⁴ It is member in numerous international committees for national accounts, it takes part in joint task forces with Eurostat and the EU member states and it contributes towards better international comparability of national accounts results through providing diverse guidelines.

(26) Verifications by the International Monetary Fund

Finally, the International Monetary Fund (IMF) also carries out comprehensive checks on parts of the official statistics on an occasional basis. Such a check of the German national accounts was last conducted in 2005. The results were summarised in a 'Report on the Observance of Standards and Codes' (Data ROSC) and also published for open public access on the Internet.¹¹⁵ Apart from the national accounts, the checks at that time also featured the fields of the government finance statistics, the balance of payments and the producer price statistics which are relevant to the national accounts. During the checks a very detailed examination was made of the calculation process employed to compile the German national accounts. This report therefore serves as a further external control instrument and helps both in our own assessment of our work and our products, as well as providing an independent evaluation of the quality and level of the German national accounts in an international comparison for our users.

¹¹³ See for example the European Court of Auditors, Special Report No 12/2012: Did the Commission and Eurostat improve the process for producing reliable and credible European statistics?

¹¹⁴ See for example OECD, Revisions of quarterly GDP in selected OECD Countries, OECD Statistics Brief, July 2015, No 22

¹¹⁵ <http://www.imf.org/external/np/rosc/rosc.aspx> (accessed on 17 November 2015)

Chapter 7 Overview of of the allowances for exhaustiveness

7.0 Introduction

- 7.01 The exhaustiveness of the results is an important goal of the national accounts, particularly because the European Union has been using the gross domestic product or gross national income results for its own resource purposes since 1988. In addition to the country-specific additions and adjustments to ensure exhaustiveness, which have been applied for a long time now in the respective national accounts, a Europe-wide harmonised approach to improve exhaustiveness was agreed in 1994.¹¹⁶ This policy mainly provides for a review of existing national estimated allowances, the inclusion of tips and the reconciliation of employment data. Another matter that relates to the concept of exhaustiveness is the examination of the way in which the economic territory¹¹⁷ covered by the national accounts is defined.
- 7.02 Paragraph 3.08 of ESA 2010 explicitly states that activities not registered with the authorities are also to be included. In the demarcation of economic activities to be recorded in national accounts (within the production boundary), it is irrelevant whether they are practised in accordance with the rules or associated with tax evasion, performed openly or in secret, practised regularly or occasionally, or produced for the market or for own use. Gaps and under-reporting in the source statistics, e.g. as the result of cut-off limits or reporting thresholds, should be remedied in the national accounts either by using estimates or on the basis of different official or non-official information.
- 7.03 Given the increasing need for GDP and GNI to be comparable, Member States have been asked to include illegal activities in national accounts calculations as part of the introduction of ESA 2010. Drugs trafficking, prostitution and the smuggling of alcohol and tobacco are considered to be the most relevant illegal activities in the EU in terms of GDP and GNI. Prostitution has already been included in previous national accounts calculations in Germany, as it is not in principle illegal in this country. However, as these activities are not recorded exhaustively in source statistics, model-based estimates have already been in use for prostitution to a significant extent since the transition to ESA 1995 as part of the comprehensive national accounts revision in 1999 in order to ensure exhaustiveness.

7.0.1 Regional coverage

- 7.04 National accounts data for Germany relates to the territory of the Federal Republic of Germany according to territorial limits since 03/10/1990.

¹¹⁶ Commission Decision 94/168/EC, Euratom of 22 February 1994 on measures to be taken to improve exhaustiveness, in Official Journal L 77 of 19 March 1994, p. 51 et seq.

¹¹⁷ Commission Decision 91/450/EEC, Euratom of 26/07/1991 on the definition of economic territory, in Official Journal L 240 of 29/08/1991, p. 36 et seq. in conjunction with Commission Regulation (EC) No 109/2005 of 24 January 2005 on the definition of the economic territory of Member States for the purposes of Council Regulation (EC, Euratom) No 1287/2003 on the harmonisation of gross national income at market prices. in Official Journal L 21 of 21/01/2005 p. 3 et seq.

7.0.2 Fundamental issues of exhaustiveness

- 7.05 The process for ensuring the exhaustiveness of GDP and GNI is checked again in Germany **as part of each revision of the national accounts**. Previous adjustments are revised as necessary where circumstances have changed or new information is available, and any new data gaps in terms of exhaustiveness adjustments are remedied.
- 7.06 The estimation method itself often results in **implicit coverage of activities**. For example, agricultural production is estimated on the basis of cultivated areas and the relevant average yields. In the same way, housing rents are calculated on the basis of the housing stock - broken down by size and other features - and the rents per square metre in each case. It is irrelevant for the exhaustive recording of such production activities whether the income estimated in this way and included in GDP is declared to the tax authorities.
- 7.07 In the **balancing of GDP**, the results of the production approach and expenditure approach in particular, which are initially estimated independently from each other, are analysed and assessed in the context of the whole economy. As a rule, this reconciliation with a bias towards the expenditure approach, which leads to an implicit inclusion of sales that are not reported to the fiscal authorities. The greater rise in the figures calculated on the basis of the production approach is due to the fact that, despite numerous additions in the course of checking for data gaps, it is still possible for certain figures to be understated in the production approach. This particularly applies in cases where VAT has been charged but has not been transferred to the fiscal authorities. The figures for gross value added and/or the recorded taxes on products, and therefore also the GDP calculated on the basis of the production approach, could well be too low by these amounts. An obvious upward adjustment is applied to compensate for this. In principle, the sum of the expenditure side aggregates does not change, since the results of the calculation undertaken on this basis are subject to a series of checks or are based on data which, due to the method, are implicitly regarded as complete. It should therefore be assumed that the figures on expenditure tend to be more complete than those on income. The correction of the figures for 2010 based on the expenditure approach may therefore be regarded as no more than 'fine-tuning'.
- 7.08 Over the years, there has evolved an ever greater **interlinkage between the calculation of domestic product and the input-output account**. For example, the detailed data from the supply and use tables, thoroughly broken down into product groups and industries, are used as a means of cross-checking the figures for domestic product that are found on the supply and use sides. Whilst the results of the domestic product calculation permit reconciliation of the overall figure as determined in the two approaches, the input-output data, which also carry very detailed breakdowns into product groups and industries, allow the calculations to be checked for consistency. In earlier years, these checks have only been possible **ex post** in the case of major revisions or for the final calculation of domestic product, since the appropriate supply and use tables were not yet available. However, as part of the comprehensive national accounts revision of 2005, it was for the first time possible, with the help of the supply and use tables, to achieve consistency **ex ante** between the highly differentiated results of the production approach by 63 industries on the one hand, and of the expenditure approach by 85 product groups on the other. Since then, the integration between the domestic product calculation and the input-output account has taken place regularly in the summer as part of the annual computations of gross domestic product, in which as a rule four previous reporting years can be revised. The results of the input-output account are then available for the two earliest reporting years and are integrated into the reconciliation process. For the year $t-4$ – the figures for which are

finalised as of the accounts date – the input-output account used is also already final. By contrast the reconciliation of year t-3 is still based on a provisional input-output account.

- 7.09 As a further safeguard to guarantee the accuracy of the national accounts, in the 2014 revision – as in previous national accounts revisions – many areas in the production approach were also **reconciled with figures from the VAT statistics**. In each case, it had to be borne in mind that this comparison can be distorted by numerous special provisions of German fiscal law and by categorisation differences between the economic systems. Through this reconciliation, important and far-reaching knowledge was gained in many areas, particularly in services, making it possible to improve the plausibility and exhaustiveness of the results in the production approach.
- 7.10 In this respect, the VAT statistics on the basis of **assessments**, issued for the first time for reporting year 2006 on the basis of NACE Rev. 1.1 and WZ 2003, represented an important new data source¹¹⁸. Through the 2008 Finance Act, the preparation and publication programme for VAT statistics, which had previously been based on advance VAT returns from businesses liable to the tax with an annual turnover of EUR 17 500 or more, was expanded to include those submitting annual returns (assessments). This statistic is available in principle with a delay of approximately four years after the end of the reporting year.
- 7.11 For the purposes of further safeguarding exhaustiveness in the production approach, this additional information, whilst admittedly subject to a delay, has since permitted a better-informed calculation for smaller companies which, in the national accounts prior to the 2011 revision, had to be estimated on the basis of modelling.
- 7.12 In mid-2014, the 2009 VAT statistics on the basis of assessments were published, containing for this reporting year for the first time evidence based on the findings of NACE Rev.2 and WZ 2008. Subsequent to the 2011 national accounts revision, this made it possible to include in the calculations for the production approach – in particular for service industry sectors – better exhaustiveness adjustments by individual sector for entities below the annual turnover thresholds that were applied to the source statistics used (advance VAT return statistics, statistical register of companies, structural survey in service industries).
- 7.13 In comparison with the outcomes from traditional VAT statistics on the basis of advance returns, the assessment statistics for reporting year 2009 include some 2.7 more taxpayers and 3.3% (approximately EUR 163 billion) higher turnover¹¹⁹.
- 7.14 In the production approach, the business register has become increasingly important as a data source following the conclusion of a long period of development and due to the methodological and content-based changes carried out in recent years¹²⁰. This is also a result of the fact that the large-scale censuses previously conducted at considerable intervals (e.g. the workplace census, census of retail and hospitality trade, crafts and trades census), which were important cornerstones of the calculation

¹¹⁸ See Ehlert, A.: 'Die neue Umsatzsteuerstatistik nach der Veranlagung' ('The new VAT statistics by assessment'), in WiSta 4/2011, page 376 et seq.

¹¹⁹ See Ehlert, A.: 'Analyse der Umsatzsteuerstatistik auf Basis der Veranlagungen 2009' ('Analysis of VAT statistics on the basis of 2009 assessments') in WiSta 11/2014, page 657 et seq.

¹²⁰ See: 'Das Stichwort: Die Bedeutung des statistischen Unternehmensregisters für die Volkswirtschaftlichen Gesamtrechnungen' ('The keyword: The significance of the company register for national accounts'), in: Methoden-Verfahren-Entwicklungen (Developments in methods and procedures), Edition 2/2011, page 3 et seq.

for the production approach, have now been largely abandoned in favour of data from the register. As previously, however, the regular calculations of the national accounts continue to take into account all the available statistical sources, whether business statistics such as the production index or structural statistics such as the cost structure survey for manufacturing industry, and these are combined together. For many of the company statistics, again the company register forms the basis for selection and extrapolation.

- 7.15 In past years there was already a close degree of cooperation between the national accounts and the statistical business register. This was further intensified due to the joint project for statistical records in the 'Third Sector'¹²¹ (non-profit institutions) and the implementation of EU Registry Regulation no. 177/2008 dated 20 February 2008 with respect to the classification of companies in the register by national accounts sectors.
- 7.16 As a result of this joint work, at the time of the 2011 revision, information for national accounts purposes was again available, for the first time in a decade, on the number of employees in the sector of private non-profit organisations (S. 15) – at that point initially for 2007. As part of the 2014 revision, the sectoral categorisation in the statistical business register was then updated, checked and where necessary adjusted for reporting year 2010.
- 7.17 This categorisation of entities in accordance with national accounts sectors now makes it possible to carry out a combined analysis of details in the register both by industry and by sector for national accounts purposes. This makes it possible, for example, to recognise what is seen under VAT legislation as the market production of non-market producers, which play an important part in particular in certain services fields such as industry section R (Art, culture and education), and to improve the VAT statistics accordingly. In the production approach, this helps to prevent double-counting of an economic activity across several national accounts sectors.
- 7.18 In addition, there now exists a special working group, comprising representatives of national and regional accounts and of the business register, that is considering in considerable detail the coherent industry-specific allocation of elements of the data sources that form the basis for the register (VAT data from the fiscal authorities, employees subject to social insurance from the employment statistics of the Federal Employment Agency). As an outcome from this working group, it has already been possible to identify and correct certain inconsistencies in the register or in its source data, and consequently to improve substantially the coherence of the national accounts on the basis of the source data.
- 7.19 After a lengthy development phase, the previous database (URS 95) was replaced on 1 July 2014 by the new business register database (URS-Neu (new URS)). URS-Neu facilitates the greatly improved maintenance of the business register using administrative, commercially purchased and collected data, more comprehensive support for carrying out surveys and a significant increase in analysis options for the business register itself. For national accounts, these further developments of the business register provide additional future potential and, where necessary, further findings as part of data reconciliation to ensure exhaustiveness.

¹²¹ The term "third sector" is used here to describe the area between the market and general government. The 'Third Sector' project was initiated and financed by a consortium comprising the Stifterverband für die Deutsche Wissenschaft (Association of German Science), the Bertelsmann Foundation and the Fritz Thyssen Foundation with the aim of assessing the economic importance of the third sector in Germany. The project report ("Abschlussbericht Modul 1" from June 2011) can be found at <http://www.ziviz.info/publikationen/publikationen-und-materialien/>.

- 7.20 Nonetheless, for the purposes of the national accounts the business register is not yet in an ideal condition in all respects since, for example, not every industry is included in the business register and it could still be improved by being more up-to-date.

7.1 Adjustments for exhaustiveness in the production approach

7.1.1 Types of non-exhaustiveness

- 7.21 Lack of exhaustiveness ('non-exhaustiveness') in national accounts or their underlying basic statistics can have various causes and can thus be assigned to specific types or categories of non-exhaustiveness (known as N-types):

- N1 The producer is not registered¹²², e.g. in order to avoid paying tax or social contributions (shadow economy activities).
- N2 The producer undertakes illegal activities, e.g. the drugs trafficking or the smuggling of alcohol and cigarettes.
- N3 The producer is not subject to registration on the grounds of being a household producer not engaged in market production or whose market production is so small that registration as an entrepreneur is not required.
- N4 A legal person or company is registered but excluded from the survey frame, for example because they fall below the threshold for a particular statistic.
- N5 Although the producer is registered, it is not recorded statistically, for example because a register is out of date or contains errors.
- N6 The producer is deliberately providing false details, for example regarding turnover and intermediate consumption, in order to evade tax.
- N7 The data are defective from a statistical point of view, either because particular data have not been recorded or because recorded data have been incorrectly processed.

7.1.2 Exhaustiveness methods

- 7.22 A description is given below of the areas in which under-recording (non-exhaustiveness) occurs in the production approach and how this is compensated or removed. In the process of each revision of the national accounts, the entire dataset and all previously used source statistics and calculation approaches are checked for exhaustiveness and accuracy during the period and new source statistics, or statistics that could not previously be (fully) taken into account are included in the calculation. In addition, recommendations resulting from visits of European institutions (e.g. the European Court of Auditors) are checked and implemented. Furthermore, the findings of various studies carried out on behalf of the Statistical Office of the European Communities, such as that on the recording of activities in the hidden economy, are taken into account. Similarly, methodological or classification changes in other aggregated data effected on the production side are reproduced consistently in the computation of value-added.
- 7.23 In line with the resulting new or amended dataset or findings, all previous adjustments to ensure exhaustiveness are checked by industry and sector and where necessary re-

¹²² 'Not registered' in this sense means that the producer is not registered with the tax or social insurance authorities or has no business registration.

adjusted¹²³ and any newly apparent gaps in the data, e.g. in the collection of data on renewable energy produced by private households, are remedied. The calculation model underlying the previous production approach is correspondingly revised and adjusted and at the same time converted for use with newer, modern software solutions.

- 7.24 The various adjustments to ensure exhaustiveness in the production approach can affect several industry divisions or be specific to just one group of industries. Some of the adjustments (e.g. for tips) can also be reflected in other parts of the national accounts (expenditure approach and/or income approach). Conversely, adjustments in other national accounts aggregated or sector data can also affect the production approach.
- 7.25 Those adjustment measures that are required in the production approach to ensure exhaustiveness are described below. As a rule, these are adjustments in the sectors of non-financial corporations (S. 11) and private households (S. 14).

7.1.2.1 Exhaustiveness adjustments affecting more than one section of the economy

a) Adjustment for hidden economy

WZ sections affected: Almost all (with the exception of sections D, K and O)

- 7.26 Exhaustiveness adjustments for hidden activities (e.g. sales without invoices, self-supply and unpaid construction work) have in the past already been made in the production approach. The ESA requires such hidden economic activities to be included where they fall within the production boundary of the ESA. Such activities can be taken into account by a suitable method of calculation, according to circumstances (e.g. price-volume approach in agriculture or dwelling services). On the other hand, they can also be taken into account through adjustments, as happens in most areas of economic activity. Such adjustments are estimated with the aid of various pieces of information and assumptions, often supported by modelling.
- 7.27 A data basis for the calculation model used to determine the production value of basically legal non-observed economy activities is provided by data from the Undeclared Work Monitoring Body (*Finanzkontrolle Schwarzarbeit, FKS*) of the Ministry of Finance (Customs Administration), available since 2009 for 27 industries. These data result from the findings of all audits by the FKS (spontaneous audits, event-driven audits, focused audits etc.). The data are sharply differentiated and provide information on a range of issues relating to undeclared work. They represent only those issues uncovered during the course of audits and investigations, however. The FKS data do not therefore provide a representative picture either of the overall level of undeclared work or of its extent.
- 7.28 For this reason, additional information has to be adduced in order to determine the overall level of legal shadow economy activities. These include, on the one hand, the findings of non-official surveys by the Rockwool Foundation for several years¹²⁴, as well as a survey on behalf of the Cologne Institute for Economic Research with data for 2006¹²⁵; and on the other hand, specific estimates for the construction industry made

¹²³ This also applies in particular in respect of 'historic' ratios for positive and negative adjustments that, for reasons of simplification, often remain unchanged for several years.

¹²⁴ See Feld, Lars P., Larsen Claus: 'Das Ausmaß der Schwarzarbeit in Deutschland' ('The extent of undeclared work in Germany'), Odense 2012, published with the support of the Rockwool Foundation.

¹²⁵ See Initiative Neue Soziale Marktwirtschaft (Initiatives of the new social economy) (2007): material accompanying a press conference on 8 March 2007;

in the context of calculations of gross fixed capital formation in construction. Alongside genuine adjustments for undeclared work, these also include adjustments for the unpaid neighbourly assistance commonly found in this area of economic activity.

- 7.29 The compensatory sums determined by the FKS for individual areas of activity are also revised to account for different degrees of monitoring, as measured by the proportion of personal interviews per persons in employment in each individual area.
- 7.30 In addition, particular situations that, on past experience, are rarely identified by the FKS – such as undeclared work in private households – are tackled by means of specific special calculations (see Chapter 3.26). This also affects prostitution which, although in principle permitted in Germany, has an additional shadow economy element (see also Chapter 3.25).
- 7.31 Where modelling estimates are concerned, the values for a basis year are calculated and in subsequent years updated in line with the estimated proportion of undeclared workers to the total number of persons employed. The benchmark figures thus calculated are checked at regular intervals and the level adjusted to take account of the latest position where necessary.
- 7.32 The calculated values of non-observed economic activities are accounted for on the production side as an exhaustiveness adjustment within each area of activity affected, as part of the output calculation. In industry section A (agriculture, forestry and fishing), the adjustments for hidden economy activities relate to services included in this section; and in section L (real estate activities) to commercial activities, thus excluding dwelling services. The corresponding intermediate consumption – where industry-specific information on employee size classes is available – is calculated by means of the intermediate consumption ratio (expenditure relative to turnover) for the smallest employee size class (1 to 19 employees). For all other industries, as an estimate half of the average intermediate consumption ratio for the respective industry is used.

b) Adjustments for units (small businesses) below the annual turnover threshold for the source statistics

WZ sections affected: Almost all service sections (G, H, I, J, L, M, N, P, R and S)

- 7.33 Some of the source statistics include only units above a specified annual turnover threshold. In the annual VAT statistics based on the advance turnover tax return and in the structural survey in the services sector, only those units are included or surveyed whose annual turnover exceeds EUR 17 500. In the business register, which also acts as the infrastructure element for the sampling population and as the basis for extrapolation of many business statistics, units are included if they have an annual turnover of EUR 17 500 or more and/or at least one employed person subject to social insurance.
- 7.34 To ensure exhaustiveness, therefore, in the production approach for the above mentioned industries, an additional estimate is included of turnover for small businesses below the annual turnover threshold. Figures from VAT statistics available annually since reporting year 2006 essentially provide the basis for this estimate according to the assessment, which in contrast to the advance turnover tax returns is based on the companies' annual turnover returns ('annual returns') to the fiscal

See also Cologne Institute for Economic Research (2009): Statement and tabular appendix for press conference entitled 'Arbeitsplatz Privathaushalt – Ein Weg aus der Schwarzarbeit' ('The private household as a workplace – a route out of undeclared work') on 24 February 2009.

authorities. This statistic thus also includes small companies that due to their low turnover are not required to submit monthly or quarterly advance VAT returns (see also section 7.02).

- 7.35 The adjustments for turnover below the annual turnover threshold are calculated for each industry separately, using small company turnover as a percentage of all turnover from the VAT assessment statistics of each area of activity. By using this adjustment, the turnover data for the above mentioned source statistics are then supplemented with turnover for small businesses. For reporting year 2010 – due to the availability of results from the VAT assessment statistics only with a certain time-lag – the ratios from 2009 could be taken into account.
- 7.36 In the industry 'Real estate activities' (L) the adjustment for turnover below the annual turnover threshold relates to the proportion accounted for by commercial activities. In the sector of professional, scientific and technical service providers, due to the high degree of volatility that still exists in the VAT assessment statistics, the previous exhaustiveness adjustments are currently being updated. As soon as the VAT assessment statistics for this WZ-sector stabilise, however, those statistics will also be used as a statistical basis for estimating small businesses.
- 7.37 In calculating the corresponding intermediate consumption for this type of exhaustiveness adjustment, essentially the relevant intermediate consumption ratio specific to that industry (intermediate consumption calculated as a percentage of output) is used.

c) Valuation adjustment for own-account fixed capital formation by mark-up of profit

WZ sections affected: Almost all (other than sectors K, L, O, P, Q, T)

- 7.38 Production for own final use, such as own-account fixed capital formation or own consumption by business owners, should essentially be valued at the production prices of comparable goods on the market (ESA 2010, Paragraph 3.45). This means that a mark-up basically needs to be taken into account for this type of production.
- 7.39 In terms of data taken from the annual (cost) structure surveys or annual surveys about own-account fixed capital formation, largely resulting from the business accounts of the individual enterprises, it is assumed that these are recorded without a mark-up for tax reasons and are therefore too low to be used in national accounts. A percentage mark-up is therefore added to the results for own-account fixed capital formation from the individual surveys in the production approach. Such mark-ups are based on modelling calculations for the individual industries mentioned above. To calculate the appropriate mark-up, results from the corporate financial statement statistics, provided by the German central bank are used, along with results from the investment account of the national accounts. Separate mark-ups are used for machinery and equipment and for building.

For reporting year 2010, the mark-up was between 4.6% and 5.2%, depending on industry sector.

d) Allowance for own-account fixed capital formation

WZ sections affected: Manufacturing industry (B, C, D, E and F)

- 7.40 From the point of view of tax legislation, it tends to be more favourable for enterprises to estimate a low value for own-account fixed capital formation in order to reduce profit. This assessment is based on information from the fiscal authorities and from tax advisors. To calculate output, therefore, an adjustment is made in the above mentioned industries to the (cost) structure statistics for own-account fixed capital

formation reported by manufacturing industry. This adjustment should be seen as separate from the profit mark-up discussed above.

For 2010, the adjustment in each of the five sectors was 25%.

e) Tips

WZ sections affected: Construction industry; trade, transportation and storage; accommodation and foodservice activities; other service activities not classified elsewhere (F, G, H, I, and S)

- 7.41 According to ESA 2010 concepts, tips received are to be recorded under both compensation of employees and output. As there is an assumption that this value is not included in the source statistics, an adjustment for exhaustiveness is made when determining output.
- 7.42 The level of the industry-specific allowance for tips is determined as part of the calculation of household final consumption expenditure. As well as being included in the production approach, these values are incorporated to the same level into the expenditure approach (household final consumption expenditure) and as part of compensation of employees (income approach).

f) Illegal Activities

WZ sections affected: Agriculture, manufacturing, trade (A, C and G)

- 7.43 In the EU, three activities – the production and trafficking of drugs, prostitution and the smuggling of alcohol and tobacco – are regarded as the illegal activities with the greatest impact on gross domestic product (GDP) and gross national income (GNI).
- 7.44 In Germany, prostitution is in principle legal. Nonetheless, such activities are not exhaustively recorded in source statistics. For these activities, model-based estimates have already been in use to a significant extent since the transition to ESA 1995 as part of the comprehensive 1999 national accounts revision in order to ensure exhaustiveness. A full description of these calculation is not provided here, therefore, but in sections 3.25 and 7.1.2.2.
- 7.45 As far as alcohol smuggling is concerned, investigations have shown that this is of only marginal relevance to Germany. For a long time now, alcohol has now longer been recorded in customs statistics. Due to the low price level of alcohol in Germany compared with other EU countries, there are no great profits to be made in this respect, so alcohol smuggling is economically unattractive.
- 7.46 Below are described the calculations for the illegal activities relevant to Germany, namely the production and trafficking of drugs and cigarette smuggling.¹²⁶ These were first included in the calculation of national income in the national accounts revision of 2014. The calculations rest primarily on expenditure-side data sources.

¹²⁶ See also Taschowsky, Peter: 'Illegale Aktivitäten in den Volkswirtschaftlichen Gesamtrechnungen – Möglichkeiten und Grenzen der Erfassung von Zigarettenschmuggel und Drogen ('Illegal activities in national accounts – options and limitations in the recording of cigarette smuggling and drugs') in: *Wirtschaft und Statistik*, vol. 2/2015, pages 28 – 41.

i. Methodological procedure for the production and trafficking of drugs

- 7.47 Estimates are made for five drug types: cannabis (separately for resin and herb), heroin, cocaine, ecstasy and amphetamines. Drug production is assumed to take place in Germany in the case of cannabis and synthetic drugs.
- 7.48 The starting point for the calculations is expenditure-side information on drug consumption. Consumption calculations are made separately for each of the five drug types, using a volume-price approach according to the following equation:

$$\text{Value of consumption} = \text{Number of consumers} \times \text{Average consumption} \times \text{Selling price in Germany}$$

Since no direct data for the three factors in this equation are available, appropriate estimates have to be made for each value, using the information that is available.

- 7.49 For the number of consumers, the Epidemiological Surveys on Addiction, conducted at regular intervals, provide information on a sampling basis. By extrapolation, the total number of drug consumers can be derived.¹²⁷ In the surveys, the 'prevalence' of different drug types is determined. In general, 'prevalence' means the epidemiological frequency of cases of a particular disease in a population at the point at which the investigation took place. In relation to surveys of drug consumption, prevalence represents the frequency of drug consumption among the respondents.
- 7.50 A distinction is drawn between lifetime prevalence, 12-month prevalence and 30-day prevalence. In the estimation model, the 12-month prevalence is used as the reference level. This is because on the one hand lifetime prevalence represents too long a period of past consumption, while on the other hand the 30-day prevalence of illegal drug consumption often provides exceptionally low values and thus does not take account of occasional opportunistic consumers.
- 7.51 Extrapolation involves multiplying the population figures for 15–64 year-olds by the prevalence. Estimated values for years where no survey takes place are interpolated. The calculation for heroin is different from the procedure described above, since consumers of this drug are difficult to access in surveys. For heroin, consumer numbers are derived from estimates based on medical treatment figures, police contacts and drug deaths, as published in the annual REITOX reports.¹²⁸
- 7.52 From the number of consumers and estimated average consumption, a total quantity consumed is derived separately for each drug type. Freely accessible literature sources are analysed in order to estimate average consumption by user and drug type. The quantity consumed annually calculated from these figures is compared with reported drug seizures by the Federal Criminal Police Office (*Bundeskriminalamt, BKA*). The seizure ratios, calculated on the basis of estimated consumed volume and quantities of drugs seized, can be used as a plausibility check. The view of experts is that in general such ratios are in the area of single-digit percentages. In individual years when large seizures have taken place, however, the ratio can assume larger proportions.
- 7.53 By valuing the volumes consumed at street prices, a figure for consumption expenditure on each individual drug type is then calculated. The Federal Criminal

¹²⁷ The Epidemiological Survey on Addiction, also called the Representative Survey on the Use and Misuse of Psychoactive Substances, is regarded as representative of Germany and is carried out by the Institute for Therapeutic Research (IFT).

¹²⁸ The national Reitox reports form the basis for the European drugs report by the EMCDDA; Reitox stands for 'Réseau Européen d'Information sur les Drogues et les Toxicomanies'.

Police Office and the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) publish yearly averages of relevant price data annually.

- 7.54 For certain substances it is assumed that they are imported in a more concentrated form and cut within the country. Cutting factors are estimated on the basis of freely available literature. As far as domestic production is concerned, the literature suggests that heroin and cocaine are not produced in Germany and that ecstasy and amphetamines are manufactured in Germany only in very limited quantities. Herbal cannabis is produced to a marked degree in Germany but a further substantial proportion, it can be assumed, is imported. By subtracting domestic production from the quantity consumed, an import volume can be determined.
- 7.55 The calculated import volume is valued at wholesale prices, similarly published by the Federal Criminal Police Office, to provide an import value. Wholesale prices are used as an approximation of import prices, since no survey data are available on import prices. The value of domestic production is calculated by subtracting the import value from consumer expenditure.
- 7.56 No survey information of any kind is available by which intermediate consumption in the production and trafficking of drugs can be calculated. A guideline level is provided by the intermediate consumption ratio of a similar, legal industry. For this purpose it is assumed that in the drugs trade, storage and transportation costs are lower and that no administration or warranty costs arise. Moreover, unlike in legal trade, there is no issue here of arranging costs to reduce tax liability. To take account of these factors, the intermediate consumption ratio from the 'similar area of activity' is reduced by one-half.
- 7.57 The output minus intermediate consumption represents the gross value added and thus the production-side contribution to gross domestic product (GDP) resulting from drug production and the drugs trade. In arithmetic terms the value of intermediate consumption accounts for the difference between this figure and the expenditure-side calculation of consumer expenditure minus import value.
- 7.58 The estimated gross value added from the production and trafficking of drugs is recorded as an under-coverage adjustment in the retail trade industry. The production of cannabis is taken into account in the agriculture and forestry industry under domestic horticultural production, while the production of amphetamines and ecstasy is counted as value added in the manufacturing industry, under the pharmaceutical industry.
- 7.59 To prevent double counting, the GNI adjustment for the contribution of the production and trafficking of drugs is limited to the value of the production side. This is because it is assumed that the intermediate consumption of the drug traders is already included in the national accounts in another place – falsely declared as consumer expenditure.
- 7.60 It is deduced that drug producers and traders are locally resident self-employed persons, since it would be difficult for non-locally resident entities to build up a customer network and ensure that it was supplied. The contribution of the drugs business to GDP is thus equal to the contribution to GNI.

ii. Methodological procedure for tobacco smuggling

- 7.61 Where smuggling activities are concerned, in Germany it is above all cigarette smuggling that is of relevance. The smuggling of raw tobacco or alcohol, by contrast, plays only a marginal role and is not specifically taken into account. Estimates of cigarette smuggling are based on a study of waste, the cigarette industry's so-called disposal study. Here data on the numbers of empty waste cigarette packets are analysed and documented with regard to taxation marks. Data from this study are available for Germany since 2005. The information is linked to estimates of total

consumption of cigarettes smoked in Germany. These estimates are produced and published by the industry and trade associations and by the cigarette manufacturers. For the years prior to 2005, calculations are based principally on consumption of taxed tobacco goods in Germany and on the market analyses specified, providing estimates of total consumption.

- 7.62 The German Cigarette Association (*Deutscher Zigarettenverband, DZV*) has been conducting its disposal study since August 2004. In at least 22 selected representative waste disposal areas covered by Germany's 'dual system', a total of at least 12 000 cigarette packets are collected and subsequently analysed by Ipsos, a market research agency. Analysis and extrapolation takes account of the smoker profile in different parts of Germany.
- 7.63 The Hamburg Institute of International Economics (*Hamburgisches Welt-Wirtschafts-Institut, HWWI*) has checked the methodology for estimating the number of cigarettes not taxed in Germany. It has concluded that on the basis of the sampling method and extrapolation from the disposal study, the biases that arise are likely to be small and the study therefore can be designated as representative. This conclusion is also supported by the fact that the market shares of individual cigarette brands found in the disposal study differ by only small amounts from total market shares.
- 7.64 From the analysis of the disposal study, deductions can be made about the proportion of cigarettes smoked in Germany but not taxed there. The number of cigarettes is recorded on a monthly basis by country of origin of the cigarette packets. It is thus possible to determine the countries from which the cigarettes not taxed in Germany came, and what proportion they represent. It is still not possible to determine directly the quantity smuggled, since there is no information on whether the cigarettes smoked in Germany but not taxed there have entered the country as legal private imports or in quantities in excess of exemption limits, or whether they were actually commercially smuggled. Legal private imports and imports exceeding the exemption limits should not be taken into account in quantifying smuggled quantities since they will already be included in travel expenditure in the balance of payments statistics. By using information on the absolute number of cigarettes (taxed and) smoked in Germany, the absolute number of cigarettes from each country can be calculated. On the assumption that only cigarettes from certain countries are smuggled (atypical holiday destinations and countries with cigarette prices markedly below the black market price in Germany), it is possible to estimate the quantity of smuggled cigarettes in Germany.
- 7.65 No illegal cigarette production has been discovered in Germany since 2005. For that reason it is assumed that, not least due to heightened vigilance on the part of the police and customs in Germany, no appreciable illegal cigarette production is taking place.
- 7.66 The import value of the smuggled cigarettes is then calculated by valuing the volume of cigarettes at the relevant price in their countries of origin and adding transport costs. Since wholesale prices in the countries of origin are not available, reference has been made for approximation purposes to consumer prices for a current premium-priced cigarette brand in those countries.
- 7.67 The brand Jin Ling and other so-called 'Illicit Whites' are a special case, since they are produced specifically for the smuggling market. For these, a lower price is assumed – one that is known from press releases and reports. The import value comprises the sum of the value of the goods and the transport costs. Transport costs have been estimated for different types of transport (private car, lorry, van) and allowing for distances from the countries of origin.
- 7.68 From the quantities smuggled, valued at the average black market price in Germany, final consumption expenditure can be calculated. Information on the black market

price is likewise available primarily from press reports. Despite slight regional variations in price information, over the course of time a broadly stable black market price can be established. The trade margin is represented by the difference between final consumption expenditure and import value.

- 7.69 No survey information, by contrast, is available by which intermediate consumption in cigarette smuggling can be calculated. The intermediate consumption ratio of a similar, legal industry is used as a guideline level here. It is assumed that in cigarette smuggling, storage and transportation costs are low and that no administration or warranty costs arise. Moreover, unlike in legal trade, there is no issue here of arranging costs to reduce tax liability. For these reasons, the intermediate consumption ratios are cut by one half. Once intermediate consumption is deducted from the trade margin, the smugglers' gross value added can be calculated, which also corresponds to their income from self employment. Since, as already noted, no production of illegal cigarettes takes place in Germany, no adjustment is required. The estimated gross value added from cigarettes not taxed in Germany is accounted for on the production side under the retail trade industry.
- 7.70 It is further assumed that traders in smuggled cigarettes in Germany are locally resident entities. Indications from research have shown that in Germany, smugglers and black market traders operate separately from one another. The contributions of cigarette smuggling to GDP and to GNI are thus identical.
- iii. Measures to prevent double-counting
- 7.71 The output minus intermediate consumption represents gross value added and thus the production-side contribution of the illegal activities to gross domestic product (GDP). In arithmetic terms the value of intermediate consumption accounts for the difference between this figure and the expenditure-side calculation of final consumption expenditure minus import value.
- 7.72 It can be deduced, therefore, that intermediate consumption by drug producers and traders, and by smugglers, is already taken into account by another means in the national accounts system. In view of the goods used, it can be assumed that such costs are already accounted for as final consumption expenditure of private households. Thus, for example, a drug producer who cultivates cannabis indoors will be most likely renting the space as a private individual, in order to remain as inconspicuous as possible. Similarly, power consumption, telephone bills and purchases of lighting systems and fertilisers can be assumed to fall into the consumption expenditure of private households.
- 7.73 In order to prevent double counting on the expenditure side, therefore, the production-side contribution of these illegal activities to GDP and GNI is added to the previous results. Final consumption expenditure of private households are thus increased not by the total consumption expenditure for illegal activities but by final consumption expenditure reduced by the value of intermediate consumption.

iv. Quantitative effect of including illegal activities

7.74 For the year 2010, therefore, the following results emerge from the recognition of illegal activities in the national accounts aggregated values itemised below.

Table 7–1: Estimates for drugs trafficking and cigarette smuggling

Year 2010 in EUR (billions)

	Drugs trafficking	Cigarette smuggling
Final consumption expenditure.....	1.930	0.528
Import value.....	0.557	0.176
Output	1.372	0.352
Intermediate consumption.....	0.169	0.036
Gross value added.....	1.203	0.316

The sum of the contributions of illegal activities to GNI for 2010 amounts to EUR 1.52 billion, or 0.06% of gross national income.

g) Employment method

7.75 The employment method, conducted in the 1990s to check the exhaustiveness of gross domestic product and gross national income calculations, relied heavily on the findings of a one-time comprehensive study on behalf of the Statistical Office of the European Communities (Eurostat)¹²⁹. Since the 2005 revision, however, it has become a fixed and integral element of the German national accounts system; and through the inclusion in the national accounts publication programme at the end of the 1990s of details on hours worked, it has undergone further systematic development and expansion.¹³⁰

7.76 Since then, some of the exhaustiveness adjustments in the production approach of the national accounts – with respect to private tuition in industry section P, for example – have relied on findings of the employment method with the employment account in the national accounts. The employment account, which is based on a number of sources from regular (often monthly) administrative, household and population statistics, serves for the relevant specialist units of the national accounts as an additional monitoring tool for ensuring exhaustiveness, particularly with regard to developments in the various industries and sectors. Conclusions about the plausibility of economic statistics in the overall context can be drawn from a comparison of the results of the employment account with the results of individual specialised statistics.

7.77 The results found in the employment account thus represent an important basis for the work of the multi-sectional 'Coherence (national accounts)' working group that was set up in the course of work for the 2005 general revision of the national accounts. In addition to checking all of the important aggregated figures in the production,

¹²⁹ See also Chapter 3.6.

¹³⁰ On the history of calculating labour volume accounts, see S. Fritsch/K. Voy (2009), 'Stellung der Erwerbstätigkeit, Arbeitsproduktivität und Arbeitszeit in den Volkswirtschaftlichen Gesamtrechnungen' ('Role of employment, productivity at work and working time in national accounts') in Kategorien der Volkswirtschaftlichen Gesamtrechnungen (Categories of national accounts), vol. 4, publisher Klaus Voy, Metropolis-Verlag.

expenditure and income approaches of the national accounts for coherence, the tasks of this working group also extend to checking the derived indicators, such as changes in labour productivity and unit labour costs, for plausibility. On the basis of the ESA-compliant categorisation of data on volume of work, these values are inspected and checked with regard to both, changes in employment level and in hours worked.

- 7.78 In particular given the changes that have occurred over time in Germany in forms of employment and increasing flexibility of working time (solo self-employment with no employees, minor employment, employment relationship within the framework of labour market policy measures), data on hours worked are of increasing importance to these coherence checks, as well as representing a direct reconciliation with the working hours data being compiled on an annual and quarterly basis in line with national accounts concepts by the Institute for Employment Research in Nuremberg, in cooperation with the Federal Statistical Office. Thus the data on hours worked by persons in employment have led to valuable findings and interpretative assistance in terms of the somewhat contradictory and initially almost incomprehensible developments linking gross domestic product and/or gross national income to employment, particularly during the time of financial and economic crisis in 2008/2009.
- 7.79 In the meantime, coherence checks in the German national accounts have been further extended to cover the differences in statistical data sources between the employment account and the production approach, in order to combat possible inconsistencies in the national accounts system due to source data drawn from different reporting routes and concepts. The statistical business register represents a common platform for these investigations since – being based on the enterprise concept, which is relevant to national accounts – it covers not only industry-specific details of employee numbers but also monetary value (turnover). For this purpose a special working group, comprising representatives of national and regional accounts and of the business register, was formed and is tackling in considerable detail and depth the coherent industry-specific allocation of elements of the data sources that form the basis for the register (VAT data from the fiscal authorities, employees subject to social insurance from the employment statistics of the Federal Employment Agency). One outcome from this working group has already been the identification and correction of certain inconsistencies in the register or in its source data, and thus in consequence a substantial improvement in the coherence of the national accounts on the basis of the source data.

h) External checks, recommendations and consultations

- 7.80 In ensuring the exhaustiveness of national accounts data, the calculations also take into account recommendations and findings from consultations with international, European and national institutions and committees, where they are relevant to gross domestic product or gross national income (see also Chapter 6.2).
- 7.81 These include, for example, information from the federal states' national accounts working group, for their regional GNP calculations, and the Deutsche Bundesbank for its balance of payments statistics, financial accounts and the collective seasonal and calendar revisions. In addition, the investigations and analyses set up by the research institutes to tackle specific economic issues and subjects can also provide important indications regarding the plausibility of individual findings from the national accounts, which can be taken into consideration during the checks for exhaustiveness of those accounts. One example in relation to this would be the adjustment for exhaustiveness

for freelance trainers in industry sector P, with reference to the sports science report from the Federal Institute for Sports Science.¹³¹

- 7.82 Similarly, in the process of ensuring the exhaustiveness of national accounts, the relevant recommendations of international, European and national institutions are taken into account. Such recommendations result mostly from visits of the European Commission, the European Court of Auditors and nationally from the Federal Court of Auditors, the Statistical Advisory Committee and the Expert Committee on National Accounts. Alongside these, international comparisons and investigations of specific issues carried out under the OECD also influence the findings of the national accounts. Finally, the International Monetary Fund (IMF) also carries out comprehensive checks on parts of the official statistics, including the German national accounts, on an occasional basis.¹³² The findings and recommendations of these checks, too, contribute to ensuring the exhaustiveness and general quality of the German national accounts.

7.1.2.2 Sector-specific adjustments for exhaustiveness

- 7.83 In addition to the previously mentioned adjustments for exhaustiveness, which may occur in several industries, adjustments are also carried out which in some cases are only industry-specific and generally result from the corresponding basic data source that is used. These adjustments have indeed already been described in section 3, but they will be summarised again below for reasons of completeness.

WZ section: Agriculture, forestry and fishing (A)

- 7.84 **Garden production**, which is not part of the economic accounts for agriculture (EEA), is included in the estimates in the area of agriculture, hunting and related activities (WZ 01).
- 7.85 Until 2003, data on garden production was available from the Federal Ministry of Food and Agriculture (Bundesministerium für Ernährung und Landwirtschaft - BMEL). Products produced as part of garden production, such as fresh vegetables, flowers and ornamental plants (including Christmas trees), fruit and eggs and other animal products (honey) have since then been updated with the corresponding information from the EEA.
- 7.86 In addition, corrections have been made in this area for the **taxes on spirits** based on data from the EEA. These calculations result from the government determination of taxes on products. As the taxes identified show a difference between the calculated taxes on spirits and those of the Federal Ministry of Food and Agriculture, an additional balancing adjustment is carried out.
- 7.87 In this area, an allowance will also be set up for agricultural **work performed by non-entrepreneurs**, which is not part of the economic accounts for agriculture (EEA). This allowance is based on data originated from the compilation of gross fixed capital formation in construction.
- 7.88 In the forestry and logging industry (WZ 02), allowance are considered for **own consumption in small businesses**, which are not part of the economic accounts for forestry (EEF). The data come from the final report of the Federal Research Centre for Forestry and Forest Products for the project "Economic accounts for forestry 1991 to

¹³¹ Horch H-D, G. Hovemann, M. Schubert: 'Bezahlte Mitarbeit im Sportverein' ('Paid work in sports clubs'), Working group for the sports development report of the German Sport University Cologne and the Institute of Sport Economics and Sport Management, Cologne.

¹³² Such a check of the German national accounts was last conducted in 2005.

2002 for the Federal Republic of Germany" (page 10). The allowance for the output was determined to be 2.5% for 2010.

- 7.89 In the area of fishing and aquaculture (WZ 03), allowances for exhaustiveness are made for **secondary activities in aquaculture**. The results from the aquaculture statistics were available for the first time for 2011. The area of aquaculture has been backcasted with the previous growth rates of the inland fisheries industry from 2010 – 1991. Based on the turnover according to the VAT statistics for 2010 an additional secondary activities ratio of 15.7% in relation to primary activity in the aquaculture statistics has been imputed.
- 7.90 An allowance of 5% of revenue for **payments in kind** was also set for the small deep-sea and coastal fishing industry.

WZ sections: Mining and quarrying (B) and manufacturing (C)

- 7.91 In the sectors of mining (B) and manufacturing (C), sector-specific allowances are used in consideration of a so called **dying group of respondents**. The last complete count like the workplace census, census of crafts and register evaluations by the regional tax offices of the fiscal administration (*Oberfinanzdirektion*) and the Federal Employment Agency (*Bundesagentur für Arbeit - BA*) have shown that base statistics used in these sectors are always under-reported. This is attributed to the fact that new establishments, company closures, insolvencies, mergers, respondent group changes or size class changes are not reported or are reported too late to the business register, which is the basis for selecting the random samples, meaning that over the course of time a dying group of respondents can emerge. A further indication of this was the fact that the VAT statistics in manufacturing were significantly higher than the national accounts approach, whereby this can definitely be attributed to the tax group problems¹³³ in the VAT statistics. A further difference could lie in the various accruals in the individual statistics.
- 7.92 The results of the (cost) structure survey (CSS/SS) were therefore each increased by 0.5% in 2010. This allowance results from the comparison of the various base statistics and previous findings (e.g. workplace results, census of crafts).
- 7.93 In relation to both sectors, there is also a **correction of the output book values**. The revaluation of stock results in slightly different output book values. The difference from collected data is determined and corrected using additional analyses.
- 7.94 In both sectors, the relevant intermediate consumption is also adjusted in relation to **mineral royalties**. Field and mining royalties are part of intermediate consumption in the cost-structure survey/structure survey. However, according to ESA 2010 concepts, these are to be recorded as rent and must therefore be eliminated from the data for the base statistics. Calculations for the general government sector (S.13) are used to determine the required scope of adjustments, plus a charge in order to also incorporate private households as payment recipients.
- 7.95 In addition, in both sectors the intermediate consumption was reduced by the **material consumption**. In 2010 the value of the material consumption in the CSS/SS is reduced by a flat rate of 0.4% with the justification that in the accruals firstly operational expenses in relation to durables of minor value were included at an estimated 0.3% too high, because small tools are often recorded as ongoing consumption instead of

¹³³ Under German fiscal law, a tax group is a group of legally independent units who come together to form a tax unit. One or more legally independent units (subsidiary companies) will be incorporated into another legally independent unit (controlling company) in financial, economic and organisational terms. The controlling company represents the entire unit in communications with the tax authorities as the uniform taxable person.

capital formation, and secondly the material consumption was stated as 0.1% too high for withdrawals for own consumption in entrepreneur households.

Research during the 2014 national accounts revision confirmed firstly that these cases occur and secondly that the allowances with the current approaches are realistic.

- 7.96 In the manufacturing of beverages (WZ 11) there is an allowance for the **Federal Monopoly Administration for Spirits** (*Bundesmonopolverwaltung für Branntwein*). The Federal Monopoly Administration for Spirits in Offenbach is not obliged to participate in the cost-structure survey. Corresponding data is therefore added explicitly. The source of data is the publicly accessible business reports.
- 7.97 In the manufacturing of coke and refined petroleum products (WZ 19), there is an allowance for turnovers from **petroleum companies**, which results from the input-output account. Internal balancing with the input-output account showed that there were inconsistencies between the sources in the refined petroleum products manufacturing industry, corrected by parallel evaluation of production statistics. A corresponding balancing entry is made in intermediate consumption for the raw materials consumed, meaning that the final effect on GDP is neutral.
- 7.98 Experience has shown that own-account production or goods for resale in the food products industry WZ 10 are Taken out of the warehouse for consumption purposes. This **own consumption** is recorded and added via extrapolation using the assumptions of the regional tax offices of the fiscal administration.

WZ section: Electricity, gas, steam and air conditioning supply (WZ D)

- 7.99 In the power supply section, an **allowance for exhaustiveness for renewable energy sources** has been set in the calculations of gross added value.
- 7.100 The cost structure survey in the area of electricity in principle includes all of the electricity produced in this industry via the incoming reports from the electricity generators with public supply mandate (electrical utilities) and the network operators. In gross terms, i.e. including electricity purchased from third parties for resale, the quantities of electricity were initially even included several times in the turnover figures in the CSS.
- 7.101 According to regulations in the ESA 2010, electricity purchased from third parties is deducted as goods for resale. However, even without this special feature, electricity purchased from third parties has been deducted as intermediate consumption in the national accounts since the ESA 1995 in order to avoid double counting.
- 7.102 As a result, in each case only self-produced electricity is considered as output and after deduction of the intermediate consumption (oil, gas, coal, uranium, but also office expenses, rent, leasing rates etc.) considered as a component of gross added value, as well as the "trade margin" from the trade with electricity purchased from third parties.
- 7.103 According to the current circumstances, without the allowance for renewable energies there would have presumably been a recording gap in the national accounts in relation to the non-electrical utilities electricity production, which is not included in the CSS and not reported in other industries. The latter is the case, for example, for electricity generation operations in companies in the manufacturing industry and in mining, whose income from electricity generation is included in the cost structure surveys of these industries.
- 7.104 As there have so far been no complete inquiries, it is only possible to give a very rough estimate of the gap. According to general assessments of experts, currently the proportion of electricity production from renewable sources was around 21% in 2010,

whereby an increasing part of this electricity is produced by (reporting) power supply companies. For the 2014 revision, an allowance was considered right back to 2001.

- 7.105 Just like in manufacturing, in the power supply industry an adjustment is made for intermediate consumption for **materials consumption** amounting to 0.4%. The details of this have already been described under manufacturing.

WZ section: Water supply, sewerage, waste management and remediation activities (E)

- 7.106 In the area of water supply, the results of the CSS are increased to determine the outputs due to **assumed under-reporting**. This allowance resulted from comparing the results of the CSS with those from the business register.
- 7.107 In addition, the intermediate consumption in this sector is reduced by the **materials consumption**. The details of this have already been described under manufacturing.

WZ section: Construction (F)

- 7.108 In the construction industry, an allowance is made of 2.5% due to **assumed under-reporting** in the area of construction of buildings (WZ 41) and civil engineering (WZ 42). This adjustment results from the data comparison with the results from VAT statistics that is repeatedly carried out at regular intervals.
- 7.109 In addition, for all areas within construction there is an allowance for **the service share of the annual construction operations performed by foreign companies**. Construction operations carried out in Germany by foreign construction companies for a period of over one year are added to the national accounts, as are construction activities carried out abroad by German companies for a period of less than one year.¹³⁴
- 7.110 There are also adjustments for exhaustiveness in the construction of buildings (WZ 41) and in specialised construction activities (WZ 43) for illicit work and **work performed by non-entrepreneurs (NU)**. Work performed by non-entrepreneurs can be both own-account construction work that is undertaken for investment reasons as well as non-capital construction work. The approach for own account construction of dwellings that is undertaken for investment reasons is based on the calculation of gross fixed capital formation in buildings and structures (see also section 5.10.1). These are assumptions made for own-account building work of the households as investors of the dwellings (including family and neighbourly assistance).
- 7.111 Initially calculated on the expenditure side and then transposed to the production side, work performed by non-entrepreneurs that is undertaken for investment reasons is broken down proportionally by the weight of nominal output for industries WZ 41 and WZ 43.
- 7.112 Non-capital construction work results from data gained from balance with the input-output accounts as well as estimates. Overall, 10% of work performed by non-entrepreneurs that is undertaken for investment reasons was included in 2010. The results determined in this way for total work performed by non-entrepreneurs are then corrected by output from voluntary activities.
- 7.113 In the areas of construction of buildings and civil engineering (WZ 41 and WZ 42), an adjustment is made to the results from the complete count in the event of 1 to 19 employees and the structural survey for 20 employees or more for potential concept-related **double counting**.

¹³⁴ See also Deutsche Bundesbank: Balance of payments statistics – statistical supplement 3 to the monthly report, table 4a, various years.

- 7.114 From a conceptual perspective, the complete count for 1 to 19 employees is based on the concept of establishment. The structure survey for 20 employees or more is based on the enterprise concept. As a result of the different concepts, it cannot be ruled out that double reporting may occur when moving from one size class to the other (19 to 20 employees). Therefore, a deduction of 2.5% is made when determining the outputs. The level of this discount has been regularly checked by the Land Statistical Office in Rhineland Palatinate and has proved to be very stable.
- 7.115 In addition, the intermediate consumption in all three areas of the construction industry is reduced for **small tools**. In this case the summarised intermediate consumption rate is reduced by 0.4%, because it can be assumed that the intermediate consumption tends to be exaggerated, because e.g. in some cases small tools or private withdrawals can be included in the operational expenses.
- 7.116 In the industries WZ 41 and WZ 42, a reduction is also made to the intermediate consumption rate of the CSS for the smallest employment size class (20 to 49 employees) amounting to 5%, which is alternatively used for calculating the intermediate consumption for size class 1-19 employees, because no primary recorded intermediate consumption information is available for this size class. The reduction gives consideration to the size class-specific depression of the rates (as the size class decreases).

WZ section: Wholesale and retail trade; maintenance and repair of motor vehicles and motorcycles (G)

- 7.117 In the wholesale and retail trade section, the results from the business register are increased by an allowance by **comparing the wholesale and retail trade statistics with the production statistics** in order to ensure exhaustiveness.
- 7.118 As part of the 2014 revision, in the wholesale and retail trade industries (WZ 45, WZ 46, WZ 47) there were extensive examinations of goods production in these areas within the input-output account. Data on goods production in the wholesale and retail trade statistics were sometimes behind those for production statistics. Therefore the output in WZ 46 (specifically: WZ 46.4 and 46.5) in 2010 was increased by EUR 3.506 billion.
- 7.119 In addition, within section G the turnover reported by enterprises in the industry for wholesale and retail trade of vehicles and motorcycles (WZ 45) for the years 2009 and 2010 was adjusted by the "**environmental premium**" (car scrap schemes) for vehicles which are recorded again in the national accounts as a subsidy in the event of conceptual adjustments.
- 7.120 As part of the verifications within the input-output account, it was also determined that the use of goods for resale in the same condition is apparently excessive in the "Repair of motor vehicles" industry (WZ 45.2), resulting in a negative trade margin in this industry. Therefore a **correction** is made of the **goods for resale** reported in the annual survey of wholesale and retail trade, repair of motor vehicles and motor cycles, which in 2010, for example, amounted to EUR 6.972 billion.

WZ section: Transportation and storage (H)

- 7.121 Within the transportation and storage section, in the air transport industry (WZ 51) an allowance for exhaustiveness was made when determining the output **due to assumed under-reporting** of the results for the structural survey in the service industries. This allowance results from the comparison of the turnover results of the structural survey with those of the annual survey for air transport.
- 7.122 When determining the allowance for exhaustiveness, consideration was given to the conceptual differences of both statistics. In comparison with the structural survey in

the service industries, the annual survey for air transport is defined according to function instead of industry, and commercial enterprises which undertake air transport as a secondary activity are also included. Therefore half of the absolute difference between the results of the structural survey in the service industries and the annual survey in air transport was set as the allowance for exhaustiveness in the calculations of the output.

- 7.123 In the storage industry (WZ 52), turnover data from the structural survey in the service industries is adjusted for the **sales** incorporated into the survey **that are carried out** by general government units in **sector S.13**. This is carried out in order to avoid double entry in both sectors.
- 7.124 In addition, in the industries of railtransport (WZ 49) and air transport (WZ 51), allowances are considered for **payments in kind** when determining the output. This is mainly justified by the fact that employees of train operating enterprises and airlines receive reduced or free journeys or flights from the employer. The level of the relevant industry-specific allowances for benefits in kind is determined in the same way as tips when calculating private consumption expenditure. As well as being included in the production approach, these values are incorporated at the same amount into the expenditure approach (household final consumption expenditure) and as part of compensation of employees (income approach).

WZ section: Accommodation and food service activities (I)

- 7.125 In the industry of accommodation and food service activities, there is only an additional industry-specific **allowance for private accommodation** in the accommodation industry (WZ 55). This allowance for smaller units is determined as part of the calculation of private final consumption expenditure (expenditure approach) (see section 5.7.14 for details).

WZ section: Information and communication (J)

- 7.126 No additional industry-specific allowances for exhaustiveness are made in this industry.

WZ section: Financial and insurance activities (K)

- 7.127 When determining the outputs, in this industry an adjustment is made for **dwelling services** included in the output data (see section 3.17 for details). From a sectoral perspective, the adjustment mainly relates to the sector of financial corporations (S.12).

WZ section: Real estate activities (L)

- 7.128 In the real estate industry, a specific allowance for **property leasing** is made for commercially operated real estate activities (without dwelling services).
- 7.129 This allowance is justified by the fact that in the VAT statistics, which are used for determining the output of the commercial part of real estate activities, the real estate activities are under-reported by the turnover of units which are included in the institutions for financial leasing sector (WZ 64.91). On the basis of an internal special investigation of the national accounts for leasing, it was identified that these units operate both property leasing and equipment leasing. Research on the basis of individual assessments has shown that only a small number of these units operate property leasing, and the majority operate equipment leasing.
- 7.130 In the industry for commercial real estate activities, an allowance was therefore set at 10% and allowance of 90% of the results from the VAT statistics was set for rental and leasing activities (WZ 77).

- 7.131 In addition, the results from the VAT statistics were adjusted in order to avoid **double reporting of tax-free turnover**.
- 7.132 In the area of dwelling services, the results are initially adjusted for those from the **government sector (S.13)**. This is largely due to the organisation of the calculations. For the calculation of all sectors (S.1), when preparing the results for the gross value added there is a separate provision of dwelling services for S.13 from the government accounts.

WZ section: Professional, scientific and technical services (M)

- 7.133 Within section M, in the scientific research and development industry (WZ 72) an **allowance for exhaustiveness is made on the basis of a comparison of employees** with the employment account in the national accounts.
- 7.134 In addition, an **allowance for land transfer tax** is carried out for notaries (WZ 69.10.3) as a special case. Land transfer tax is incorporated into gross fixed capital formation in construction as part of the expenses of acquisition. It should therefore also be taken into account in product supplies (on the production side). This is done with an explicit allowance added to output (and taxes on products) in the notary industry. This method is neutralised for the industry once again upon transition to basic prices as part of conceptual changes.
- 7.135 From the government sector (S.13) there is also an **allowance for imputed social contributions** in this of industry (for details on this see also sections 3.21 and 4.7.2.2).
- 7.136 In the area of other professional, scientific and technical services not specified elsewhere (WZ 74.9) there is currently an **allowance due to assumed under-reporting**. This results from a comparison of the data from VAT statistics and the structural survey in the service industries as part of the transition from the NACE Rev. 1.1 (WZ 2003) to the NACE Rev. 2 (WZ 2008). The results of the VAT statistics 2009 (advance VAT returns), which for the first time were based on WZ 2008, showed much lower turnover data for WZ 74.9 in comparison with that of the structural survey in the service industries and the short-term survey in the service industries, which had also an effect on the level of industry 74. In relation to the exhaustiveness, the transcoded results of the VAT statistics 2008 were therefore updated on the basis of the WZ 2008 for industry 74 for the following years with the annual rate of change from the structural survey in the service industries. The new level determined in this way for the entire section was subsequently divided into the industries concerned, using the structure from the VAT statistics. It was therefore possible to eliminate the under-reporting of VAT data existing in the VAT statistics for WZ 74.9.

WZ section: Administrative and support service activities (N)

- 7.137 In this section, additional specific adjustment for exhaustiveness is needed in particular in the area of rental and leasing activities (WZ 77) in relation to the leasing. This means that the results of the VAT statistics are supplemented to include **equipment leasing** from the industry 64.91 (institutions for financial leasing). This allowance has already been described in detail in section L (real estate activities).
- 7.138 In addition, in this industry an allowance is made for **affiliated leasing**. This is justified by the fact that the assignment of the units in the VAT statistics is not possible beyond doubt, because many leasing companies are indeed legally independent, but they are often subsidiary companies within a group/tay-group. Since the VAT statistics treat the group or principal enterprise as the sole taxable entity, and since the main activity of such groups is often manufacturing, the turnover data for the leasing enterprises would be 'lost' if only the VAT statistics pertaining to this industry were consulted. As the data referring to manufacturing output are drawn from the relevant base statistics

rather than the VAT statistics, and the base statistics state the 'industry' turnover rather than that of the group, they are also left out of account.

- 7.139 To counter this problem, first of all the leasing enterprises are separated into **affiliated** and **independent** enterprises. The turnover of the independent leasing enterprises is contained in the VAT statistics for WZ 77. The affiliated leasing is, as described above, mostly viewed as being integrated into the group. For this area an **allowance** is determined on the basis of information available internally from the relevant enterprises.
- 7.140 Reporting and preparation of the annual accounts of the large leasing companies resulted in a turnover volume for the entire area of affiliated leasing in 2010 of EUR 17.924 billion. Of this, EUR 2.893 billion was deducted for the book value disposals from the lease assets, because this related purely to a balance sheet extension for the output and intermediate consumption. The remainder was taken into account along with the values from the VAT statistics, from which the balance-sheet extension items were also deducted which were equivalent to the value of intermediate consumption.

WZ section: Public administration and defence; compulsory social security (O)

- 7.141 In this section, on the production side **allowances are used for imputed social contributions** and **for other taxes on production** (motor vehicle taxes in the case of the government), which originate from the calculation of the general government sector. From a sectoral perspective, these are adjustments which related to sector S.13 (general government) (for further details on this see also sections 3.21 and 4.7.2.2).

WZ section: Education (P)

- 7.142 In the area of education, specific allowances for exhaustiveness are made for individual industries. In industry 85.5 (Other education services), these are **allowances for freelance trainers**, as well as **allowances for VAT-exempt services** in 85.5 and 85.6 (Educational support services). Amongst other things, these industries include sports, leisure and cultural education. Within the framework of the consistency check on the results of the production approach in comparison to the employment details in the employment account in national accounts, carried out once again as part of the 2014 revision of national accounts, it was established that the VAT statistics (advance VAT returns) in the corporations sector do not cover all the services carried out in this industry, particularly in terms of privately organised tuition and adult further education. This could possibly be because the resultant income is recorded under taxes on income, not VAT.
- 7.143 The allowance for **freelance trainers** covers services that are purchased from non-profit institutions serving households (S.15) (see chapter 5.8). This allowance for exhaustiveness was determined in line with the 2005/2006 sport science report published by the Federal Institute of Sport Science (*Bundesinstitut für Sportwissenschaft*)¹³⁵.
- 7.144 A further industry-specific adjustment of turnover figures from VAT statistics (advance VAT returns) is carried out in industry 85.4, which includes amongst others universities. Given the **"reintegration of universities"** from the corporations sector into the general government sector as part of the 2011 revision of national accounts, the

¹³⁵ Horch H-D, G. Hovemann, M. Schubert: "Paid work in the sports club", working group sports development report from the German Sport University Cologne (Deutsche Sporthochschule Köln) and the Institute for Sports Economy and Sports Management, Cologne (Institut für Sportökonomie und Sportmanagement).

VAT advance VAT returns data are adjusted to take into account the sales made by general government units in sector S.13 in order to prevent double entry in both sectors in the national accounts.

WZ section: Human health and social work activities (Q)

- 7.145 In this area, there are a number of industry-specific adjustments for exhaustiveness. In the area of doctors and specialised practices (WZ 86.21 and 86.22), the results from the base statistics are increased by the **payments of a so called medical practice fee** by private households stipulated by law from the year 2004 to 2012. In order to make these payments in the case of private households visible, in coordination with the expenditure approach, allowances have been made in the outputs, which were based on the payments of the statutory health insurance funds and therefore did not include these additional payments. This means that the output in 2010 was increased by EUR 1.547 billion. The bases for the data are the statements concerning additional payments according to the "KV45 statistic" for the area of medical treatment. This statistic is provided by the Federal Health Ministry.
- 7.146 In the Dental practice activities industry (WZ 86.23), an allowance is applied to cover **outpatient dental treatment that is not included in the KZBV (*Kassenzahnärztliche Bundesvereinigung*) statistics**, e.g. dental services purchased on a purely private basis and the privately invoiced services of dentists employed in hospitals or similar institutions.
- 7.147 In the case of healthcare not specified elsewhere (WZ 86.90.1,2 and 9), allowances are generated on the output for **assumed under-reporting and income from private liquidation** and in particular for the other independent activities in healthcare (WZ 86.90.9) in order to record **services exempt from VAT**.
- 7.148 In the industry of social work activities (WZ 87 and WZ 88), allowances for exhaustiveness are also made in order to record services exempt from VAT.
- 7.149 From the government sector (S.13) there is an **allowance for imputed social contributions** in this of industry (for details on this see also sections 3.21 and 4.7.2.2).

WZ section: Arts, entertainment and recreation (R)

- 7.150 Within this section, additional industry-specific adjustments for exhaustiveness are effective for **tips** in the area of gambling and betting activities (WZ 92) and in some cases for **freelance trainers** in the area of services in sports, entertainment and recreation (WZ 93).
- 7.151 In industry WZ 92.00.2 "casinos and gaming clubs", a 35% supplement is added to the gross proceeds to allow for the content of the staff tronc, i.e. the tip cash in the case of roulette, along with an estimate of the value of the pages' tronc, based on a sample survey. A further allowance, representing 5% of the taxable turnover, is added to cover other tips in the area of casinos and gaming clubs.
- 7.152 The allowance for freelance trainers covers services that are purchased from non-profit institutions serving households (S.15) (see chapter 5.8). This allowance for exhaustiveness was determined in line with the 2005/2006 sport science report published by the Federal Institute of Sport Science (*Bundesinstitut für Sportwissenschaft*).
- 7.153 From the government sector accounts (S.13) there is an **allowance for imputed social contributions** in this industry (for details on this see also sections 3.21 and 4.7.2.2).

WZ section: Other service activities n.e.c. (S)

- 7.154 Within this section, some industry-specific adjustments for exhaustiveness are made. These adjustments cover the turnover figures from **prostitution** not included in the results of VAT statistics and other statistical sources.
- 7.155 Prostitution, which has basically been legal in Germany since 2002, has long been included in German national accounts results. As part of the 2011 revision of national accounts, the calculation method used here was converted to a new comprehensive model that complies with all corresponding European requirements.
- 7.156 The starting point is a calculation of prostitution in Germany as a whole, i.e. both statistically recorded prostitution and prostitution not included in statistics. In this case, with a differentiation according to four types of prostitution (brothel, street prostitution, hostess services, other prostitution), the number of prostitutes working, their average daily customer contacts and an average price are used in order to calculate the output for this personal service. In order to calculate the intermediate consumption, a intermediate consumption rate differentiated according to the four stated types of prostitution is used in order to determine the intermediate consumption of the prostitutes.
- 7.157 In a further step, various under-reporting rates are also used for these prostitution types in order to determine the total under-reporting allowance for the prostitution not included in the basic statistics. The proportion of prostitution already included in the basic statistics has changed over time, because with the abolition of the mandatory health check (2000) and the complete liberalisation carried out two years later, there are an increasing number of female and male prostitutes opting for legal registration and therefore also statistical reporting. These registered prostitutes and their turnover are, however, often not reported in the area of prostitution, but instead in many other industries, because this professional group which has been legal in Germany for a decade is still not entirely socially acceptable.
- 7.158 The recording of the under-reporting allowance is carried out in WZ S, which is where prostitution is classified in the WZ system. The allowance on the output in 2010 was EUR 9.262 billion, and EUR 4,576 billion was used for intermediate consumption, which resulted in an allowance for exhaustiveness of EUR 4.686 billion for under-reported prostitution.
- 7.159 In addition, an allowance is considered for the **remuneration** of members of parliaments (federal, state and local level) in the industry for other personal service activities (WZ 96) when determining the outputs. The results for this allowance are calculated as part of the government accounts in the national accounts, and are provided for the production approach. The calculation is based on information from financial statistics sources. The intermediate consumption rate of 25% from WZ area 96.09 is used for the calculation of the intermediate consumption.
- 7.160 In the industry hair salons (WZ 96.01), there is also a percentage allowance on the results from the VAT statistics, which results from the comparison of the results from VAT statistics with those from the sample survey of income and expenditure (EVS).

WZ section: Household services (T)

- 7.161 This industry does not include any further specific adjustments in addition to the adjustments for exhaustiveness for **hidden economy activities** already described in section 3.26.
- 7.162 When the whole economy is considered across all industries and sectors, in 2010 the adjustments in the production approach to ensure exhaustiveness amounted to EUR 206.5 billion for the output and EUR 57.6 billion for intermediate consumption.

For gross value added, this resulted in adjustments amounting to EUR 148.9 billion or around 5.8% in relation to GDP. In relation to the summarised sectors S.11/S.14, the adjustments in 2010 for gross value added amounted to EUR 125.2 billion. Of this, EUR 181.7 billion was for the output and EUR 56.5 billion was for intermediate consumption (see also Chapter 3.4 and Table 3–3).

7.2 Adjustments for exhaustiveness in the expenditure approach

7.2.1 Types of non-exhaustiveness

7.163 As in the production approach, the non-exhaustiveness in the expenditure approach can have various causes and can be correspondingly standardised. The categories or types of non-exhaustiveness (N types) correspond to those in the production approach (see Section 7.1.1). The following N types are relevant in particular to the expenditure approach:

- N1 The manufacturer/supplier is not registered¹³⁶ in order to, for example, avoid paying tax or social security contributions ("underground activities").
- N2 Manufacturers/suppliers undertake illegal activities, such as drug trafficking or the smuggling of alcohol and cigarettes.
- N4 A legal person or company is registered, but is not included in the statistics e.g. because its size is below a certain threshold.
- N6 The manufacturer/supplier deliberately provides incorrect information on turnover and intermediate consumption, for example, in order to evade taxes.
- N7 The data is defective from a statistical perspective, either because specific data has not been collected or because collected data has been incorrectly processed.

7.2.2 Exhaustiveness methods

The following briefly explains which areas in the input account include under-coverage (non-exhaustiveness) and how this is compensated or rectified (also see section 5).

Adjustments concerning HFCE

- 7.164 There is under-coverage in various supply areas in the calculation of household final consumption expenditure, which is compensated by allowances for exhaustiveness.
- 7.165 Allowances for the **shadow economy** are made for numerous supply sources. The calculation method is outlined as part of the output account in section 7.1.
- 7.166 Allowances are also required for **small businesses** as the companies register and sales tax statistics do not include companies with annual sales of less than EUR 17,500. The source for the allowance consists of the statistics on VAT assessments (EVAS 73312), which display data on the turnover of small businesses.
- 7.167 Referring to hotels and restaurants (supply source 10), a special allowance is made for **private accommodation**, i.e. for the renting of accommodation that is not included in statistics, as the owners only lease properties to a limited extent and are therefore not subject to taxation and statistical reporting. The allowance is explained at the corresponding chapter.

¹³⁶ In this context, 'not registered' means that the manufacturer is not registered with the tax or social security authorities or is not registered as a business.

- 7.168 Allowances for **income in kind** are based on various sources and are explained in more detail in supply areas 3 (industry), 9 (transport) and 10 (Hotels and restaurants). (See sections 5.7.6, 5.7.13 and 5.7.14.)
- 7.169 **Tips** do not have an explicit, statistical data source and are estimated on a pro rata basis. This concerns supply sources 5 (construction), 6 (Trade and repair of motor vehicles), 9 (transport), 10 (Hotels and restaurants) and 15 (other services). Further information can be found in sections 5.7.8, 5.7.9 and 5.7.19 of this method description.
- 7.170 Allowances for **prostitution, drug trafficking and tobacco smuggling** are assigned to a supply area and described in more detail in section 7.1.
- 7.171 The results of the output account are adopted in particular in supply areas 14 (health and social affairs) and 15 (other services) and a consumption rate is provided, insofar as applicable. Many allowances can be assigned to a supply area or a separate account.

Adjustments concerning GFCF in buildings and structures

- 7.172 Gross fixed capital formation in buildings and structures includes explicit allowances for exhaustiveness in the total amount of EUR 23.241 bn. This corresponds to 9.8% of capital expenditure on building, comprised as follows:

In calculating GFCF in buildings and structures in the main construction industry, an allowance of 2.5% is added to the annual value of construction work by all enterprises due to the assumed statistical under-coverage. This corresponds to EUR 1.580 bn. **Construction work on dwellings undertaken by households** represents the largest portion of the allowances added to the calculation of GFCF in buildings and structures. This figure includes unpaid assistance from neighbours and family members as well as the value of clandestine work. Since this work does not feature in tax returns or statistical surveys, its value has to be estimated. The estimates are based on the statistics on construction activity (EVAS 31111, 31121). These statistics contain details of the number of building permissions issued and completions reported and the construction cost of residential buildings, subdivided into buildings with one, two and three or more dwellings. The use of an early indicator, namely the number of building permissions issued, in conjunction with a late indicator, i.e. the number of completions, is designed to ensure that the estimated value of investors' own construction output can be assigned to the actual period when the housing in question was being built. As well as the construction of new buildings, these figures also cover conversion work for which a building permission is required. From the assessed construction costs for each housing category, an estimate is made of investors' own output as a percentage of total construction output. A figure of 22.2% has been found for 2010 according to the size of building and regional location. This is added to the gross fixed capital formation in dwellings (excluding investors' own output and the cost of ownership transfer on land) as shown in the investment account, which produces a figure of EUR 20.069 bn to be shown in the national accounts for investors' own construction output. In a comparison with the 'Clandestine work' project, half of this value was attributed to clandestine work, and the other half to own-account GFCF of the households as investors of the dwellings (including family and neighbourly assistance). Own-account construction output in the domains of agriculture and non-profit institutions organisation serving households is determined by taking into account the construction work undertaken by construction companies for these sectors. Own-account construction output for public buildings is calculated based on public finance statistics. The overall own-account construction output for these domains amounts to EUR 1.592 bn.

Adjustments concerning GFCF in intellectual property products

- 7.173 **Acquired software** is determined in the expenditure approach using an estimation model (also see section 5.10.4). Data on acquired software is available for NACE/WZ sections H, J, L, M, N and S (NACE/WZ division 95) from the 2000 reporting year as a result of structural surveys in the service sector. As this survey includes a question on acquired software which must only be answered by survey units with sales of more than EUR 250,000, an allowance for under-coverage for smaller companies is estimated based on the ratio of acquired software to total gross fixed capital formation of large companies.

7.3 Adjustments for exhaustiveness in the income approach

- 7.174 Various allowances are included in calculating compensation of **employees** depending on which calculation method is used. As long as the calculations are made by multiplying average wages and salaries by the number of employees, the calculations of average earnings in a particular industry will cover the entire industry per se. Information on the exhaustiveness of the calculations therefore mainly focuses on the degree to which the employment account is covered. Considering all industries together, the level of coverage for the employment account lies at almost 100%. Significant **estimates** are made in particular for the **construction industry** and **household services**.
- 7.175 The source statistics used to determine the **baseline values for average gross wages and salaries** to a great extent correspond to the concepts of ESA 2010. For example, the gross wages and salaries in the 2008 labour cost survey include special payments such as bonuses and additional monthly salaries, as well as tax-exempt allowances for night and Sunday work. Income components that are to be classified as wages and salaries according to the concepts of ESA 2010 but are not recorded in source statistics or not implicitly included in source figures are added to gross wages and salaries. This particularly includes tips, with their volume being determined in the context of the calculation of household consumption expenditure and recorded to the same amount as wages and salaries. Allowances are made for certain wages and salaries in kind, in order to correct possible under-reporting of these remuneration elements in source statistics. As already mentioned elsewhere, allowances are also made for groups of people (disabled people in workshops, people performing Federal voluntary non-military service, priests and church officials) and industries (household services) not included in source statistics (see also section 4.7.1).

Chapter 8 Transition from GDP to GNI

8.01 The transition from gross domestic product to gross national income includes a transition from the domestic concept, used to calculate GDP, to the national concept used for GNI. To this end, all primary income received by nationals from the rest of the world must be offset against primary income paid to the rest of the world and added to GDP. The balance of primary income is composed of the compensation of employees received from inward and outward commuters, the taxes on production and imports paid to the European Union, the subsidies on products and other subsidies granted by the EU and the property income received from and paid to the rest of the world..

Table 8–1: Transition from GDP to GNI
Year 2010 in EUR (billions)

Gross Domestic Product	2 580.060	
	From the rest of the world	To the rest of the world
Compensation of employees	9.870	8.028
Taxes on production and imports		4.165
Subsidies	5.648	
Cross-border property income	184.405	136.898
Interest.....	103.543	93.096
Distributed income of corporations*	53.368	34.96
Reinvested earnings on foreign direct investment	19.961	3.572
Investment income attributable to insurance policyholders	1.264	3.662
Income from investment certificates.....	6.269	1.608
Total primary income	199.923	149.091
Balance of primary income		50.832
Gross national income		2 630.892

* including rents

8.1 Compensation of employees

8.02 The remuneration of outward commuters in 2010 totalled EUR 9.870 m¹³⁷, and that of inward commuters to Germany totalled EUR 8.028 m¹³⁸. Remuneration of outward and inward commuters is calculated in the same way as that of national employees, whereby its constituent components, gross wages and salaries and employer social contributions, are calculated separately and then added. The gross wages and salaries

¹³⁷ Remuneration paid from the rest of the world.

¹³⁸ Remuneration paid to the rest of the world.

are calculated by multiplying the average salaries and wages by the number of inward and/or outward commuters.

8.1.1 Number of outward and inward commuters

a) Number of outward commuters

- 8.03 In 2010 around 195,000 people commuted to work outside Germany. A distinction is made between employees of foreign armed forces in Germany, workers at representative offices of foreign states in Germany and at international organisations, German students abroad (insofar as they are also employed abroad) and cross-border commuters.
- 8.04 Information on the number of employees of foreign armed forces in Germany is from the Federal Ministry of Finance. Information on the number of German workers at foreign representative offices in Germany can be found in the employment statistics of the Federal Employment Agency, and information on the number of students abroad in education statistics (EVAS 21311). Data on employees at international organisations and the European Central Bank is provided by the German Central Bank. The greatest proportion of outward commuters by far, some 163,000 people, corresponding to 83% of all outward commuters, were cross-border commuters to countries neighbouring Germany and to Italy.¹³⁹ In 2010, around two thirds of all cross-border commuters commuted to Switzerland, Luxembourg and the Netherlands.
- 8.05 Information on outward commuters to the Netherlands, Luxembourg, France and Switzerland is provided by the German Central Bank. The number of outward commuters to other (neighbouring) countries is based on partially updated information from the relevant countries on commuters from Germany working there. A small proportion of outward commuters cannot be assigned to neighbouring countries and therefore are not included in the number of cross-border commuters. These employees are incorporated as long-distance commuters.

b) Number of inward commuters

- 8.06 In 2010, a total of 235,000 residents of other countries commuted to Germany for gainful employment. They are differentiated into cross-border commuters, seasonal workers, workers at German representative offices abroad and foreign students in Germany, insofar as they are also employed in that country.
- 8.07 Information on the number of workers at German embassies abroad can be found in the Federal Budget, while information on foreign students in Germany can be found in education statistics. Data on the number of cross-border commuters, including workers subject to social insurance contributions and marginal part time workers, can be found in employment statistics. These statistics document employees who work in Germany and live abroad. In 2010, almost half of all inward commuters were cross-border commuters, and by far the most cross-border commuters lived in France. A significant proportion of inward commuters are seasonal workers. In 2010, around 40% of inward commuters, corresponding to 93,000 people, were employed in Germany as seasonal workers. The persons included in the account come from Eastern and South-Eastern European countries which have been EU Members for some time.
- 8.08 Insofar as the seasonal employment of foreign workers required permits, the number of seasonal workers was estimated on the basis of information from the Federal Employment Agency (International Placement Services) on granted work permits. The

¹³⁹ No outward commuters have yet been documented for Poland and the Czech Republic.

EU membership of the workers' countries of origin and the subsequent movement of workers means that permits and seasonal procedures for foreign seasonal workers are no longer required.¹⁴⁰ The data base required to determine numbers of seasonal workers is thus no longer available. This number has since been updated using the last-available results and plausible assumptions.

8.1.2 Average gross wages and salaries of outward and inward commuters

a) Average gross wages and salaries of outward commuters

- 8.09 The gross wages and salaries of German employees of foreign forces stationed in Germany are assessed on the basis of annual information provided by the Federal Ministry of Finance. Information on the average earnings of employees at international organisations and the European Central Bank is provided by the German Central Bank. The calculation of the average gross wages and salaries of German workers at foreign representative offices in Germany is based on updated employment statistics from the Federal Employment Agency.
- 8.10 The German Central Bank provides information on the average gross wages and salaries of outward commuters (cross-border commuters) to Switzerland, France and Luxembourg. Information on the average earnings of German outward commuters to Austria is provided by Statistik Austria. For other countries where cross-border commuters from Germany work, the calculation of gross wages and salaries per employee is based on information from Eurostat on the average earnings in the manufacturing industry in the countries concerned. In 2010, the average gross wages and salaries of German cross-border commuters were EUR 44,219.

b) Average gross wages and salaries of inward commuters

- 8.11 With regard to the average gross wages and salaries of inward commuters (cross-border commuters) subject to social insurance contributions, information is available in the form of employment statistics which are differentiated by countries of origin and/or the (foreign) place of residence of employees. The average earnings are increased by 8% in order to include income components above the contribution assessment ceiling.¹⁴¹ For the recent year the average gross wages and salaries of inward commuters have been updated with the rate of change for the average earnings of the entire economy.
- 8.12 The average gross wages and salaries of national workers in marginal part time work are applied to inward commuters in minor employment. As foreign seasonal workers primarily work in the agricultural sector, the average gross wages and salaries of these inward commuters are determined based on the average earnings of national full-time workers in this industry. Figures on the gross wages and salaries paid to the foreign employees of German diplomatic, consular and cultural missions abroad are recorded in the annual federal budgets and are converted to average earnings since the number of employees is known.

¹⁴⁰ Union citizens from Estonia, Latvia, Lithuania, Poland, Slovakia, the Czech Republic and Hungary have enjoyed full freedom of movement since 1 May 2011. Full freedom of movement for workers entered into force on 1 January 2014 for Romania and Bulgaria. However, work permits were no longer required for seasonal workers from these two countries after 1 January 2012. This has been the case for citizens of Croatia since 1 July 2013.

¹⁴¹ The 8% increase results from an evaluation of income tax statistics.

- 8.13 The average gross wages and salaries of inward commuters (cross-border commuters) amounted to EUR 29,955 in 2010. This also includes the wages and salaries of marginal part time workers.

8.1.3 Employers' social contributions for inward and outward commuters

a) Employers' contributions for outward commuters

- 8.14 Employers' social contributions for German employees of foreign armed forces stationed in Germany are assessed on the basis of the German contribution rates. The contributions paid to the insurance funds (supplementary insurance) are allowed for at a rate of 2.5%, which is based on information from the Federal Ministry of Finance.
- 8.15 The German contribution rates are also used to determine the employers' social contributions of German staff at foreign diplomatic, consular and cultural missions in Germany.
- 8.16 The calculation of the social security contributions made by outward commuters to Switzerland, Luxembourg and France is based on information from the German Central Bank. The employer contributions for outward commuters to other neighbouring countries (Denmark, the Netherlands, Belgium, Austria) and Italy are based on information provided by statistical offices and the central banks of these countries, or on relevant information from the OECD.

b) Employers' contributions for inward commuters

- 8.17 The average social contributions of national employees, differentiated by type of employment, are applied to the gross wages and salaries of cross-border commuters in order to determine the employers' social contributions of cross-border commuters and seasonal workers.
- 8.18 The employer contributions for foreign employees of German diplomatic, consular and cultural missions abroad, although insignificant in terms of scale, are estimated using the contributions payable within Germany.

8.2 Taxes on production and import paid to EU institutions

- 8.19 The taxes on production and import paid to the rest of the world constitute European Union own resources (in as much as they relate to taxes). In 2010, EUR 4.165 bn in taxes was paid to the rest of the world (EU). All of these are classifiable as taxes on products.

Table 8–2: Taxes paid to the rest of the world

Year 2010 in EUR (billions)

Type of tax	
Import duties	4.135
Customs duties	4.135
Levies and monetary compensatory amounts.....	0.000
Other taxes on products	0.030
Co-responsibility levies on milk and cereals.....	0.000
European Coal and Steel Community levy	0.000
Production levy for sugar.....	0.030
Taxes on products paid to the European Union	4.165

The sources for the calculation of taxes payable to the EU are the balance of payments figures compiled by the Deutsche Bundesbank (EVAS 83111)¹⁴².

- 8.20 In accordance with Regulation (EC) No 2516/2000 of the European Parliament and of the Council of 7 November 2000 governing the recording of taxes and social contributions, the recording of cash receipts is time-adjusted. The date of recording is determined by the collection date prescribed in the Finance Act. For this reason, the cash receipts in respect of customs duties are time-adjusted by one month.

8.3 Subsidies granted by EU institutions

- 8.21 EU subsidies are calculated on the basis of Annex E 'Organisation of EU markets' of Chapter 1004 'Organisation of markets, measures and emergency provisions' of the federal budget. In 2010 they amounted to a total of EUR 5.648 bn of which EUR 0.064 bn comprised subsidies on products and EUR 5.584 bn other subsidies on production. This Annex forms the basis for calculating the subsidies on products and other subsidies on production paid by the EU (see the description of subsidies on products and other subsidies on production in sections 3.29 and 4.9).

¹⁴² See also Deutsche Bundesbank, Statistisches Beiheft zu den Monatsberichten, Reihe 3.

8.4 Cross-border property income

- 8.22 Cross-border property income is derived from a resident's ownership of an external financial asset (credit) and vice versa from income derived from a non-resident's ownership of a domestic financial asset (debit).
- 8.23 Property income can be interest on debt receivables on one hand, or dividends, other earnings from equities, direct investment shares and other participation rights on the other hand. It can also include reinvested earnings from direct investments and other investment income such as that attributable to insurance policy holders, and distributed and reinvested income on investment share certificates.
- 8.24 With the exception of the basic amount for calculating the investment income attributable to insurance policy holders and the service charge by which the interest is to be corrected (FISIM), all components of cross-border property income are taken from the Balance of Payments statistics. In the Balance of Payments, property income is distinguished between the function of the underlying asset, so into income from direct investment, portfolio investment, other capital investments and foreign reserve assets. Within these functional categories, investment income is further subdivided according to the type of asset. Moreover, data are differentiated by resident sectors (Bundesbank, Monetary Financial Institutions (MFIs), corporations and private households, general government) to which the income accrues or by which the expenditure is incurred. In the case of portfolio investments, income is also subdivided by sector of the non-resident issuer.
- 8.25 Property income, together with compensation of employees, taxes on production and imports to the EU and subsidies from the EU, constitute the primary income balance. A key source for the survey of property income is the direct reporting system of the Bundesbank. All payments between residents and non-residents exceeding EUR 12.500 must be reported if they are not connected to the import and export of goods. All the reports received each month undergo a comprehensive completeness check.
- 8.26 There are gaps in the survey, however, particularly on the income side, which have to be closed using estimates. This applies, for example, to income from investments in foreign securities or to income from assets held by German non-banks at credit institutions abroad. The retained (reinvested) profits from foreign investment funds, which do not need to be reported, are also determined using an estimation procedure.

In 2010, cross-border property income can be broken down as follows:

Table 8–3: Cross-border property income

Year 2010 in EUR (billions)

	Revenue	Expenditure
D.41 Interest.....	103.543	93.096
D.42 Distributed income of corporations*	53.368	34.960
D.43 Reinvested earnings on foreign direct investment.....	19.961	3.572
D.441 Investment income attributable to insurance policy holders	1.264	3.662
D.443 Income from investment fund certificates.....	6.269	1.608
D.4 Cross-border property income.....	184.405	136.898

* including rents

8.4.1 Interest

- 8.27 Interest is property income to which the holders of certain financial assets are entitled because they have put these assets at the disposal of another institutional unit. Interest is paid on (1) deposits and loans (including intra-group lending), (2) on debt securities, (3) on insurance technical reserves and (4) on the foreign reserve assets of the Bundesbank and the IMF's special drawing rights.
- 8.28 In principle, property income is to be presented in accordance with the accrual principle. This principle stipulates that the interest is not to be recorded at the time of payment but distributed over the investment period on an accrual basis. This provision for interest income from debt securities is implemented on an aggregated basis. Where this cannot be applied, a simplified back-calculation method is used in all other cases. The recorded interest payments are distributed equally over the preceding interest periods. The yearly payment of interest is assumed. With this method, a monthly figure on an accrual basis is made up of a twelfth of the interest payments for the current month and a twelfth of each of the 11 preceding months. For items for which no interest payments are reported, estimation procedures are used in accordance with the accrual principle.
- 8.29 Cross-border property income is recorded before the deduction of any capital income taxes that may be due. Interest income is also adjusted for financial intermediation services indirectly measured (FISIM; further information on how this is calculated can be found in Section 3.17). The reason for this is that financial intermediaries often charge their customers indirectly, via the interest margin, for the service they provide. These indirectly provided services are not recorded as property income but under financial services.
- 8.30 Payments linked to financial derivatives, such as interest rate swaps and forward rate agreements, do by convention not represent interest income and are recorded as transactions in the financial account.
- 8.31 Interest income and expenditure is determined differently for the individual assets – according to which data sources are available:
- (1) Deposits and loans (including intra-group lending): For income and expenditure, it is possible to refer to reports which have to be submitted to the Bundesbank in accordance with Foreign Trade and Payments Regulation. Under-reporting is usually found on the credit side. Gaps in reporting can be filled by estimates using statistics on assets held by domestic persons in foreign banks; these statistics are made available by the Bank of International Settlements (BIS).
 - (2) Debt securities:
 - (a) Interest income is calculated using the single security inventories reported by domestic custodian banks, with the help of the CSDB – Centralized Securities Database – of the European System of Central Banks (ESCB). Securities held in custody abroad by domestic non-banks, however, are not subject to the reporting obligation. The interest from these securities held abroad must therefore be estimated.
 - (b) Interest expenditure for short-term debt securities must also be estimated, because the interest on these instruments tends to be generated not via coupon payments but via markdowns against the nominal value. Based on the foreign liabilities from issuances of short-term debt securities and extrapolated with balance of payments transactions, the income is estimated assuming that the interest payable

is equal to the 6-month Euribor. Interest from long-term debt securities is recorded using the direct reporting system.

- (3) Insurance technical reserves (see Section 8.4.4. below).
- (4) For the Bundesbank, all interest income and expenditure is taken from internal accounting. Security income will be allocated to foreign reserve assets or to interest from debt securities, depending on which type of security it is. The interest income on the IMF's special drawing rights is provided by the internal accounting of the Bundesbank.

8.4.2 Distributed income of corporations

8.4.2.1 Dividends and other distributed profits

- 8.32 Dividends from equity relating to portfolio investments and direct investment, are recorded separately according to sector. Other types of profit distribution occur in the context of direct investment relationships, by companies which have a different legal form from that of a limited company ("non-limited companies").
- 8.33 In principle, dividend payments and other distributed profits have to be reported, however, estimates are required on the credit side of portfolio investment, based on in the international investment position stocks. Dividends are reported at the time of payment and also recorded for the corresponding month.
- 8.34 Dividend payments of over two billion euros are checked separately according to a procedure agreed within the ESCB. The aim of these checks is to prevent so-called super dividends from being published as investment income. Super dividends are payouts which are not only based on the profits of the last financial year but which are also, or only, made up of liquidated reserves from the preceding years. These must be reported separately and are not recorded as investment income but as equity disinvestments in the financial account. As part of the standard processing of incoming reports, all payments above 100 million euros will be separately checked for plausibility. In the event of dividend payments of more than two billion euros, the reporting entity will also be questioned about the composition of the amount paid.

8.4.2.2 Withdrawals from the income of quasi-corporations

- 8.35 Withdrawals from income of quasi-corporations are essentially transferred profits from entities which possess a complete set of accounts but do not have an own legal personality (quasi-corporations). This includes, for example, legally dependent branches and branch offices of domestic companies abroad. Withdrawals from income of quasi-corporations are classified as investment income from direct investments or, in in case the 10% criteria for direct investment is not met, as income from other investments. The latter also includes income from shares in international organisations, such as profit distributions from the BIS and the ECB to the Bundesbank.
- 8.36 Long-term building sites (i.e. building sites which are in existence for over a year) in Germany and abroad are also considered to be quasi-corporations. Per country the income in excess of the cumulative expenditure on building sites abroad is recorded as earnings. Expenditure is calculated in the same way for building sites within Germany.

8.4.3 Reinvested earnings on foreign direct investment

- 8.37 Reinvested earnings are company profits which are not distributed to shareholders but instead remain in the direct investment enterprise. For statistical purposes, a distribution of profits followed by a reinvestment of the direct investor is assumed.
- 8.38 In a direct investment enterprise, at least 10% of the equity or voting rights is held directly by a non-resident investor, or directly and indirectly together more than 50%. Branches and permanent domestic establishments are also regarded as direct investment enterprises. This concept complies with the method of "direct influence and indirect control" (DIIC) and thus with international standards to identify FDI entities belonging to an enterprise group.
- 8.39 Reinvested earnings are determined by the net operating profits from the foreign direct investment stock statistics survey described below. These data are subdivided, at country level, into the three domestic sectors 'MFI', 'financial corporations' and 'non-financial corporations and private households'. The grants to avoid losses and the distributed dividends are deducted from the net operating profits; both kinds of transactions are to be reported as investment income in accordance with regular reporting requirements. Because the net operating profits are given as annual figures whereas the data on dividends and loss compensation grants is given as monthly figures, the annual reports are converted into monthly values before calculating the reinvested earnings.
- 8.40 For the compiling of stock data, all domestic banks, companies, private individuals and public authorities that engage in foreign trade must, in accordance with the reporting requirements of the direct investment stock survey, provide annual reports featuring detailed information on cross-border equity interests (direct investments), if the balance sheet total of the investment objects exceeds 3 million euros or the equivalent amount in a foreign currency. If the investor who is subject to reporting obligations holds shares in several companies based abroad, a separate report must be submitted for each company. Reports on direct investment companies abroad may only be compiled on the basis of consolidated annual financial statements if the information cannot be obtained from individual financial statements because the applicable national accounts rules do not stipulate that individual financial statements must be drawn up. A prerequisite of this, however, is that the reports relate only to companies in the same country and the same area of economic activity.
- 8.41 Income from direct investment does not include profits or losses arising from valuation effects, because these are not reported or recorded under profit and loss until they are realised. Net operating profits in accordance with the direct investment stock survey do not include unrealized valuation differences. This is because the principle of prudence in the German Commercial Code's accounting rules prevents them from being recognised on the balance sheet. If reports are submitted in accordance with international accounting rules, they are to be recorded as cumulative changes in equity capital which do not affect profit and loss and are not included in income from direct investments.

8.4.4 Other investment income

a) Investment income attributable to insurance policy holders

- 8.42 The calculation of investment income attributable to insurance policy holders paid to the rest of the world is based on the figures in the profit and loss accounts of German insurance companies, which are made available by the Federal Financial Supervisory Authority. Income from the investment of their own funds is deducted from the total

property income for the different insurance classes (see also Section 3.17.2) in order to calculate the investment income attributable to the policy holders. The income from the investment of insurers' own funds is determined as a ratio of the total of the insurance technical reserves in relation to the balance sheet total.

- 8.43 Using the percentage of the premiums reported in the direct reporting system in relation to the total insurance premiums accrued by German insurance companies, the share of investment income attributable to foreign insurance policy holders is determined. This calculation also differentiates between individual insurance classes.
- 8.44 To calculate the investment income on insurance contracts accrued to German insurance policy holders, in the absence of other information, the proportion of premiums and investment income from insurance contracts with German insurance companies will also be consulted. This proportion and the reports on premium payments to the rest of the world, taken from the direct reporting system, are used to calculate the investment income of German insurance policy holders from the rest of the world.

b) Investment income payable on pension entitlements

- 8.45 Due to the structure of the German pension insurance system, it is assumed that no cross-border claims will arise against pension funds.

c) Investment income attributable to collective investment funds shareholders

- 8.46 The recording of distributed investment income from investment funds is based on data from the direct reporting system. For capital growth investment funds established abroad, an estimate is made for the assumed investment of income for domestic investors. The income is calculated using reference rates which represent the income from distributing funds applied to corresponding international investment position stocks. No estimate is currently made for the investment income of domestic capital growth funds because this form of investment is relatively insignificant in Germany.

d) Rents on land and subsoil assets

- 8.47 Income from the rent of land and the provision of subsoil assets is ascertained using the Bundesbank's direct reporting system. Rent payments received by residents from non-residents in return for the renting of their land abroad are recorded as investment income. Rent payments made by residents to non-residents in return for the use of land in Germany are allocated to the expenditure side. Rents from land in Germany and rent expenditures for land abroad are recorded as services, not as investment income.

Chapter 9 Description of the main classifications used

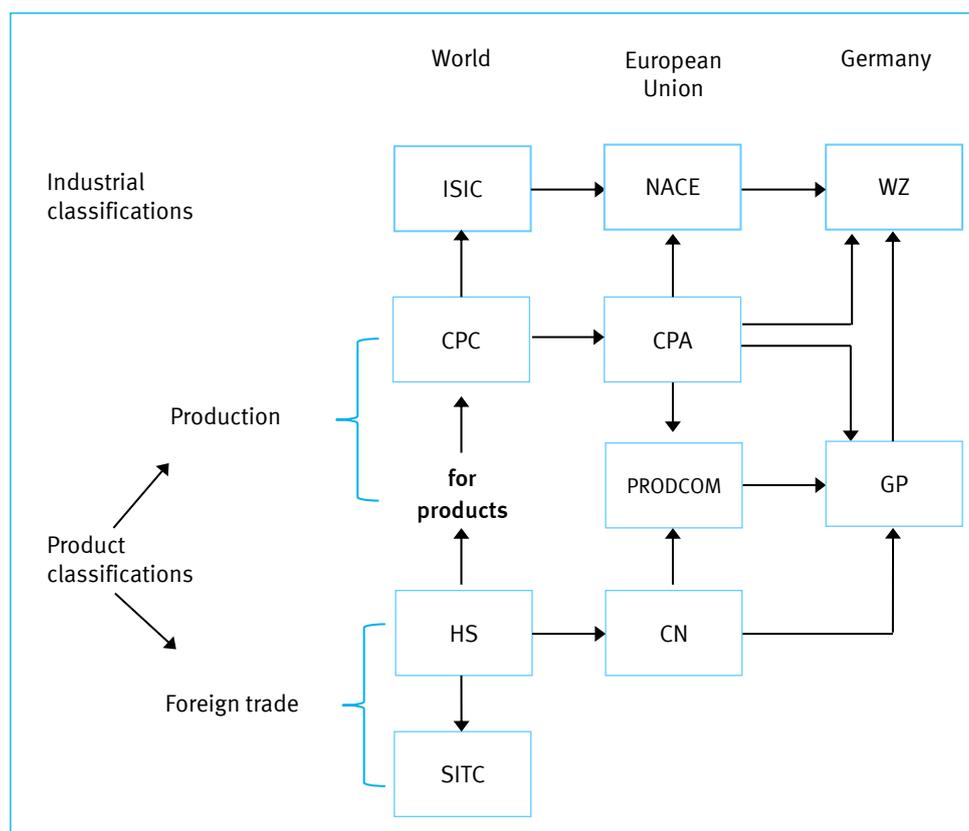
- 9.01 Classifications are used in order to record and clearly present the vast volume of data collected during the examination of complex material. A binding classification makes it possible to record the observed facts in their entirety and without overlap. Classifications are therefore an important statistical instrument that makes feasible to present and analyse the collected information. The variety of requirements that statistical data has to satisfy necessitates the development of a series of classifications serving many different purposes. All statistical classifications, however, have three characteristics in common. They record the entirety of what is being monitored. The use of mutually exclusive categories also guarantees that every recorded element is allocated to only one category of the classification. Methodological principles are designed to facilitate the consistent allocation of elements to the different classification categories.
- 9.02 The classification of economic activities is vital for the national accounts. Such classification must reflect the reality of economic activity in Germany as closely as possible while also ensuring a high level of trans-national comparability, given the growing international integration of national economies. For these reasons, classifications are regularly reviewed as part of an international coordination process. The aim of these revisions is to implement necessary adjustments to altered economic and technical conditions, and to meet the need for international harmonisation. To some extent, this has reduced the importance of the national viewpoint, due to the need to gain better comparison of the data. National interests have benefited in part from the fact that, for example, extra classification levels have been added to expand the national versions of the internationally agreed classifications.
- 9.03 The use of classifications for the purposes of the national accounts is regulated in ESA (see ESA 2010 Section 1.54 et seq., 2.144 et seq.) ESA 2010 distinguishes two types of statistical units, which serve different analytical purposes and for which different classifications are used: the institutional unit and the kind-of-activity unit. Institutional units are defined as economic entities which own goods and assets and operate as independent economic players (e.g. private or public enterprises, foundations, private households). They are divided into the following six sectors according to their basic function, the way they operate and their aims:
- a) Non-financial corporations
 - b) Financial corporations
 - c) General government
 - d) Private households
 - e) Non-profit institutions serving households
 - f) Rest of the world
- 9.04 This grouping makes it possible to represent income and its use in the national economy, as well as financial flows and balance sheets. In ESA 2010 provides for the Classification of the Functions of Government (COFOG) for government expenditure. The Classification of Individual Consumption According to Purpose (COICOP) can be used for the private households sector, as can the Classification of Household Income and Expenditure (SEA), which is used in Germany.

- 9.05 For analysing production and consumption of goods and services it makes sense to choose units which are as homogeneous of possible with regard to economic and technical characteristics. Because a big company, for example, can manufacture a wide range of products, all of which call for different manufacturing procedures, it is helpful to divide the company up into smaller, homogeneous units. For these purposes, the ESA has introduced the concept of the local kind-of-activity unit (local KAU). A local KAU encompasses all the parts of an institutional unit which carry out production activities of the same type at a particular location. All local KAUs in a national economy are grouped into economic sectors according to the production activity. The products manufactured in the production process (goods and services) are divided into product groups. For these purposes, ESA 2010 prescribes the Statistical Classification of Economic Activities in the European Community (NACE Rev. 2) or the German Classification of Economic Activities (WZ 2008) used in the German national accounts. The European Classification of Products by Activity CPA Version 2.1 or the German Systematic Classification of Commodities for Production Statistics GP 2009 are used for describing products.
- 9.06 In the past, international organisations and individual states tended to develop classifications independently from one another in accordance with their intended purposes. However, due to the increasing international integration of national economies the need for comparable and up-to-date economic data has risen significantly. As a result, in the late 1980s/ early 1990s, a process of international harmonisation of economic classifications began, primarily under the auspices of the United Nations. This gave rise to an integrated system of corresponding classifications which are internationally harmonised across the board, including in their definitions and classification rules. To some extent, this has reduced the importance of the national viewpoint due to the need to gain better comparison of the data. This system is represented in figure 9–1.
- 9.07 An integrated system like this ensures that data from different statistical areas can be compared. Thus, for example, statistics on the production of goods can be compared with foreign trade statistics. Information about the international classifications included in this system and about the conceptual links between them can be found in RAMON, a publicly accessible database run by the Statistical Office of the European Communities (Eurostat), available at www.ec.europa.eu/eurostat/ramon.
- 9.08 It is necessary to review the classifications regularly so that they can be adjusted to reflect changing environments. However, the changes can cause significant discontinuities in both data production and data use. For this reason, some classifications – particularly those which have a very wide range of uses, such as the WZ and the GP – are revised at longer intervals. The shift to the new classification requires extensive planning and preparation.
- 9.09 The revision of national classifications was implemented after the product classifications CPC and CPA, and the economic sector classifications ISIC and NACE, had also been subject to review at international level, which led to new requirements for the GP and the WZ. The main goals of the revision were to further harmonise international classifications and to make necessary adjustments to reflect altered economic and technical conditions. It was necessary in particular to take into account the growing importance of the services sector, the increasing division of labour in the economy and the progressive deregulation of the markets. It was also necessary to take account of the changing importance of certain sectors and the emergence of new sectors and products by updating the economic sector and product classifications. Data users and compilers in business, economy, research and society were closely involved in the creation of the further subdivided WZ and the new GP, meaning that

both classifications could be developed in a practical way and rendered appropriate for their many different tasks.

- 9.10 Below we describe the main classifications used in the German national accounts in more detail and examine the way in which they relate to the classifications specified in ESA 2010. We also explain several key aspects of the latest revision of the WZ. The structure of the classifications and further information can be accessed on the website of the Federal Statistical Office www.destatis.de and on the classification server of the federal and Länder statistical offices at www.klassifikationsserver.de.

Figure 9–1: International system of economic classifications



ISIC	= International Standard Industrial Classification of All Economic Activities
NACE	= Statistical classification of economic activities in the European Community
WZ	= Klassifikation der Wirtschaftszweige (German classification of economic activities)
CPC	= Central Product Classification
CPA	= Statistical classification of products by activity
PRODCOM	= Products of the Community
GP	= Systematisches Güterverzeichnis für Produktionsstatistiken (German Systematic Classification of Commodities for Production Statistics)
HS	= Harmonized Commodity Description and Coding System
CN	= Combined Nomenclature
SITC	= Standard International Trade Classification

9.1 German Classification of Economic Activities (WZ 2008)

- 9.11 The economic sector classification WZ 2008 groups together statistical units whose economic activity is aimed at manufacturing certain products. It thus collects statistical information on economic activity in accordance with product manufacture. The manufactured products are described in the product classification CPA and, as regards Sections B and C of WZ 2008, in GP. Further explanations on this subject are given in Section 9.2. The data in the production approach in particular is recorded in the classification of economic activities, but also some aggregates in the expenditure approach and income approach.
- 9.12 WZ 2008 was not developed specifically for the purposes of the national accounts; instead it is used with a wide range of statistics. It serves to classify data which relates to statistical units, e.g. to a company or an establishment within a company. It is the basis for, among other things, the compilation of statistics on output and production factors entering the production process (labour, equipment and materials, energy etc.), capital formation and financial transactions of the units in question. WZ 2008, both in its structure and in terms of its concepts and definitions, is compatible with the classifications used internationally, and forms a part of the international system of economic classifications (see Figure 9–1).

Application principles of WZ 2008

- 9.13 An economic sector classification serves to classify statistical units (e.g. companies or establishment) according to the type of economic activity they carry out. Statistical units can be defined in different ways using specific characteristics, e.g. by location. The WZ does not provide categories for specific types of statistical units per se. The classification does not differentiate by ownership structure, legal organisation or forms of operation of a unit, because these criteria do not relate to the characteristics of the activity itself. Units engaged in similar economic activities will be classified in the same way regardless of whether they are (parts of) corporations, sole proprietorships or public enterprises, whether the parent company is a foreign unit or whether the unit consists of more than one business unit. Which units are classified according to the economic sector classification is not determined by the classification, therefore, but by the users for their own purposes. As described above, ESA 2010 defines the local KAU as a statistical unit which is to be classified according to NACE/WZ for the purposes of the national accounts.
- 9.14 An economic activity is carried out when, through the combined use of production factors (e.g. assets and labour), manufacturing processes or intermediate products, certain goods or services are produced. An economic activity is thus characterised by the use of production factors, a manufacturing process and a production outcome (goods or services). An economic sector composed of statistical units with similar economic activities can generally be described by the products produced (goods and services). This ensures compatibility with the CPA and for Sections B and C of WZ 2008 with GP 2009. The production activity is described, irrespective of whether it is carried out by power machinery or by hand, in a factory or in a private household. "Modern" or "traditional" is not a criterion. The classification of economic activities also does not differentiate between official and unofficial or between legal and illegal production. The identification and classification of illegal activities and activities which are part of the shadow economy in the context of the national accounts are outlined in Chapter 7 of this method description.
- 9.15 An economic activity according to the definition used here may consist of a simple procedure, but may also encompass a whole range of sub-procedures which all belong to different categories of the classification (the production of a car, for example,

includes specific activities such as casting, forging, welding, assembly, painting etc.) A statistical unit can carry out one or more economic activities belonging to one or more economic sectors of WZ 2008. Distinctions are drawn between principal activities, secondary activities and ancillary activities.

- 9.16 The principal activity of a statistical unit is the activity which makes the greatest contribution to the total value-added generated by that unit. It is not necessary for the principal activity to generate 50% or more of the unit's total value-added, however. A secondary activity is defined as any other activity carried out by the unit for which the production outcome is goods or services for third parties. Principal and secondary activities are generally carried out with the support of a number of ancillary activities, such as accounting, transportation, storage, purchasing, sales promotion, repair and maintenance etc. Ancillary activities, then, are activities which provide goods or services solely for use within the unit.
- 9.17 The activity-related allocations and classification criteria also apply to the organs of general government. Therefore they are not all classified in Section O "Public administration and defence; compulsory social security" of WZ 2008. Government units whose activity is specified or included in other economic sectors, regardless of whether they are located at national, Länder or local level, are allocated to the division in which the relevant activity is recorded (e.g. in Section P "Education" or Section Q "Human health and social work activities"). WZ 2008 does not contain a breakdown by sectors.
- 9.18 In the classification of economic sectors, a distinction is not generally drawn between market and non-market economic activities as defined in SNA/ESA, even if this distinction plays an important role in the national accounts. The subdivision of economic activities according to this principle is useful when data is collected on activities which are carried out on both a market and a non-market basis. This criterion can be cross-classified with the categories in WZ.

The following table summarises the formal structure of the classifications of economic activities of the UN (ISIC Rev. 4), the EU (NACE Rev. 2) and the Federal Republic of Germany (WZ 2008):

Figure 9–2: Summary of the formal structure of the classifications of economic activities

Classification level	ISIC Rev 4	NACE Rev 2	WZ 2008	WZ 2008 code
Sections.....	21	21	21	A-U
Divisions.....	88	88	88	01-99
Groups.....	238	272	272	01.1-99.0
Classes.....	419	615	615	01.11-99.00
Subclasses.....	-	-	839	01.11.0-99.00.0

- 9.19 The Statistical Classification of Economic Activities in the European Community (NACE) is derived from the United Nations International Standard Industrial Classification (ISIC). The basic structure of ISIC and the contents of its subdivisions have been maintained unchanged. In order to take account of the additional information requirements at EU level, the groups (three-digit) and classes (four-digit) of ISIC are further subdivided in some places in NACE. The subdivisions in NACE are described by

the items in CPA. The German Classification of Economic Activities (WZ) was created by adopting the NACE structure and supplementing it with an additional hierarchy level for national purposes. Its subclasses (five-digit) can be described using the registration numbers in the Systematic Classification of Commodities for Production Statistics (GP).

- 9.20 The structure of WZ is identical to that of NACE Rev. 2 at the first four hierarchy levels. Of the 615 classes in NACE Rev. 2, however, 113 were further subdivided at national level in order to take account of the additional information requirements in Germany. This was how the 839 subclasses of WZ 2008, which are only applicable in Germany, were created.
- 9.21 In addition to the classifications of NACE Rev. 2 and WZ 2008, other internationally standardised aggregates – developed by national accounts experts for reporting in the context of the national accounts and, where appropriate, for other macro-economic analyses – are also available. The designation of the aggregates A*3, A*10, A*38, A*64 indicates how many categories the sections of ISIC/NACE/WZ are grouped into. These aggregates are not part of the specified classifications but are seamlessly integrated into their structure. The Federal Statistical Office usually publishes the results of the national accounts by economic sector in the classification A*64.

Revision of WZ

- 9.22 WZ 2008 is based on NACE Rev. 2, which was published with Regulation (EC) No 1893/2006 of the European Parliament and of the Council of 20 December 2006, and which itself is based on the revised UN classification ISIC Rev. 4. The present WZ 2008 is a revised version of WZ 2003. Among other things, further subdivisions were introduced in relation to the provision of services. This fulfilled one of the objectives of the revision, which was to better reflect the altered economic environment. The same purpose is served by the division of the old section "Transport and communications" into the newly created, separate sections "Transport and storage" and "Information and communication activities".
- 9.23 The stated aims of the revision included, among other things, a clear distinction between the production of goods on the one hand and the associated services on the other hand. Services associated with the production of goods include, in particular, the repair, maintenance and installation of goods and the provision of support services for the production of goods and services. This led, for example, to a significant increase in the number of service items in agriculture and forestry. In the sections mining and education new service items were created. For the repair, maintenance and installation of machines and equipment, which previously tended to be assigned to the same subclass as the manufacture of these goods, there is now a separate division in WZ 2008 within the manufacturing sector.
- 9.24 From a methodological point of view, two important changes were implemented. In cases of vertical integration – i.e. when different stages of production are carried out one after the other by the same unit and the output arising from one production process serves as input for the next stage of production – classification in WZ 2003 was determined by the final output. In WZ 2008, it is the stage of production which makes the greatest contribution to the unit's gross value-added that determines which economic sector the unit is allocated to.
- 9.25 In the opposite case – the outsourcing of production processes – a different method is used. Units which resell goods purchased from other entities on their own behalf, but which have outsourced their manufacturing to third parties, were assigned to the manufacturing sector in WZ 2003 if they were either the owner of the input material to be processed and/or owned the industrial property rights (patents, licenses etc.) to the

products being manufactured by third parties. In WZ 2008, however, ownership of the industrial property rights alone is no longer sufficient for a unit to be classified in the manufacturing sector. Now, non-manufacturing units can only be allocated to the manufacturing sector if they act as a principal and provide the contractor (subcontractor with the necessary input material for free. If the unit issuing the commission does not own the input materials for the production process which it has commissioned, it is allocated to Section G ("Wholesale and retail trade; repair of motor vehicles and motorcycles"), and in some cases also to other sections of WZ 2008.

9.2 Classification of products

- 9.26 Product classifications serve to classify products (goods and services) which have characteristics in common. In the national accounts, the Systematic Classification of Commodities for Production Statistics, Version 2009 (GP 2009) is used. The GP is used in particular for the expenditure approach and therein for determining investments in machinery and equipment by product type.
- 9.27 GP 2009 is a less aggregated German version of CPA, which is the official EU-wide central statistical classification of products in conjunction with economic sectors in the European Economic Community. GP 2009 is limited to the products of mining, quarrying and manufacturing, i.e. the products recorded in Sections B and C of CPA 2008. The GP was created by combining the CPA hierarchy levels in the areas mentioned with the subdivisions of the PRODCOM list, the list of products for the European production statistics, and by adding registration numbers to expand the classification for national purposes.
- 9.28 The classification structure of GP 2009 – apart from a few exceptions – reflects that of WZ 2008 and NACE Rev. 2 down to the level of classes (four digits). In the first six digits, the coding and description text of GP 2009 is based on the corresponding items from CPA 2008. The first eight digits of the GP code correspond (apart from a few exceptions) to the eight-digit code of the PRODCOM list 2008; the ninth digit is reserved for national subdivisions.

Figure 9–3 shows the formal structure of GP 2009.

Figure 9–3: Formal structure of GP 2009

Classification level	GP 2009
Product division (two-digit)	29
Product groups (three-digit)	104
Product classes (four-digit)	245
Product categories (five-digit)	592
Product subcategories (six-digit)	1583
Product types (nine-digit)	5137

The products recorded by the Classification of Commodities for Production Statistics (GP) include so-called Industrial Services (assembly, repairs, maintenance and refinements) as well as (transportable) goods.

9.3 Classification of government expenditure by function

9.29 The Classification of the Functions of Government (COFOG) serves to record government expenditure by economic function in an internationally standardised way. It is a classification with three levels, and the degree of detail increases considerably from one level to the next. At the first level, government expenditure is broken down into the ten divisions (two-digit) listed below. At the second level there are 69 groups (three-digit) to account for, and at the third level there are 109 classes (four-digit).

01 General public services

02 Defence

03 Public order and safety

04 Economic affairs

05 Environmental protection

06 Housing and community amenities

07 Health

08 Recreation, culture and religion

09 Education

10 Social protection

9.30 The COFOG classification in its current version was developed by the Organisation for Economic Co-operation and Development (OECD). It is an important statistical tool for the analysis of public finances. The classification makes it possible to account for government expenditure in detail by its purpose (e.g. education, social security, public health etc.)

9.31 One of the great advantages of COFOG is that it is integrated into the European System of Accounts (ESA) 2010, which ensures the use of standardised Europe-wide concepts, definitions and accounting rules.

9.32 The COFOG classification is currently needed in the national accounts for two calculation purposes. Firstly, it is used to separate consumption into individual and collective consumption.¹⁴³ Secondly, government expenditure by economic function has to be transmitted to Eurostat once a year in accordance with Annex B of Council Regulation (EC) 2223/96 (Table 11 of the ESA Transmission Programme). The transmission obligation provides for a classification of government expenditure in accordance with the COFOG groups for the government as a whole and for its subsectors (central, Länder and local governments, and social security funds), broken down according to the ten COFOG divisions. At the same time, expenditure has to be organised according to selected economic types (ESA transactions) with the result that a two-dimensional data body is created. Results for the sector of general government must be calculated in a consolidated form, i.e. all flows between the different

¹⁴³ Consumption can be represented according to two different concepts: so-called final consumption expenditure and actual final consumption. While final consumption expenditure focuses on who finances consumer spending, actual final consumption looks at who ultimately consumes the products. Thus part of the government consumption expenditure – for goods and services needed for public health or education, for example – directly serves to meet the needs of private households. This expenditure can be directly allocated to particular households, individuals or groups of individuals – i.e. it can be individualised.

subsectors of government must be eliminated when amalgamating the individual subsectors into the general government sector.

- 9.33 The compilation of government revenue and expenditure in the national accounts is based on the public finance statistics. The annual accounting figures from the public finance statistics for the Federal Government, the Länder and the municipalities are processed by combining a grouped budget, which means the categorisation of public revenue and expenditure by economic transaction (e.g. earnings of civil servants, white-collar workers' salaries, blue-collar workers' wages, etc.) with functional categorisation by purpose. The division into status and activity categories must follow the relevant administrative provisions for the budget structure of the Federal Republic and the Länder and the structure of the municipalities' budgets. An own detailed and binding accounting framework also exist for the the expenditure and revenue of the individual social security branches (German Pension Insurance, Statutory Health Insurance, Statutory Accident Insurance, Statutory Long-term Care Insurance and Agricultural Pension Funds).
- 9.34 Based on the governments' grouped budget and the accounting framework of the social security branches the components required to calculate the output and the government final consumption expenditure can be identified (e.g. employee compensation, intermediate consumption, sales). The functional breakdown makes it possible to assign the local KAUs within the general government sector to the appropriate economic sector as defined in WZ 2008 and to allocate government expenditure to the relevant COFOG categories.

9.4 Classification of the purposes of household final consumption expenditure

- 9.35 Household final consumption expenditure is classified according to purpose in the German Classification of Household Income and Expenditure (SEA 2013). SEA is made up of three parts: the Classification of Household Income, the Classification of Individual Consumption by Purpose and the Classification of Household Expenditure (without individual consumption). The second part of SEA 2013, the Classification of Individual Consumption by Purpose, is based on the United Nations Classification of Individual Consumption by Purpose (COICOP) and its further subdivided European version. COICOP is a component of both the international System of National Accounts (SNA 2008) and the European System of Accounts (ESA 1995 and 2010); it is used to calculate and represent household final consumption expenditure as part of GDP. In particular, the price adjustment of household final consumption expenditure is carried out by attributing the relevant consumer price indices to the SEA items at a very detailed level.
- 9.36 According to the methodological requirements of ESA 2010, private consumption includes household final consumption expenditure, final consumption expenditure of NPISHs and government final consumption expenditure for individual consumption. COICOP reflects this approach of the national accounts and therefore takes account of the consumption expenditure of all three institutional sectors in its classification structure. The Classification of Individual Consumption by Purpose in SEA 2013 therefore includes household final consumption expenditure (Divisions 01 to 12), final consumption expenditure of NPISHs (Division 13) and government final consumption expenditure (Division 14).

At the highest hierarchy level, the COICOP/SEA classifications according to purpose fall into the following ten divisions:

- 01 Food and non-alcoholic beverages
- 02 Alcoholic beverages, tobacco and narcotics
- 03 Clothing and footwear
- 04 Housing, water, electricity, gas and other fuels
- 05 Furnishings, household equipment and routine maintenance of the house
- 06 Health
- 07 Transport
- 08 Communications
- 09 Recreation and culture
- 10 Education
- 11 Restaurants and hotels
- 12 Miscellaneous goods and services
- 13 Final consumption expenditure of non-profit institutions serving households
- 14 Individual consumption expenditure of general government

9.37 SEA is completed by Division 00 for Household income and Division 15 for Household expenditure without individual consumption. These two divisions are not applicable to the national accounts, however.

9.38 The Classification of Individual Consumption by Purpose (Divisions 01 to 14) encompasses the following classification levels:

Figure 9–4: Classification of Individual Consumption According to Purpose

Classification level	SEA 2013
Divisions (two-digit)	14
Groups (three-digit)	58
Classes (four-digit)	157
Subclasses (five-digit)	343
Categories (six-digit)	509
Subcategories (seven-digit)	1017

The two-digit, three-digit and four-digit levels are identical to the corresponding subdivisions of the COICOP. For family-budget survey purposes, Eurostat has subdivided the four-digit classifications of COICOP still further. This five-digit classification level was also incorporated without modification into the SEA. The six- and seven-digit codes, finally, are purely national subdivisions. For the national accounts, there is an obligation to supply Eurostat with data on consumption expenditure according to SEA/COICOP two-digit classifications. National data on, household final consumption expenditure in Germany is usually published according to SEA three-digit classifications.

Chapter 10 Main data sources used

10.1 Official surveys used in the GNI calculations

Serial No.	EVAS No.	Name	Production approach	Expenditure approach	Income approach
1.	12111	Population census	X		
2.	12211	Microcensus standard programme	X	X	
3.	12212	Microcensus supplementary programme	X	X	
4.	12411	Current population statistics	X	X	X
5.	12621	Life tables			X
6.	13111	Statistics of employees subject to social insurance contributions	X		X
7.	13211	Labour market statistics of the Federal Employment Agency	X		
8.	13231	Unemployment statistics in the context of labour market statistics based on the ILO concept	X		
9.	13321	Estimation of persons in employment and the labour force in the territory of the Federal Republic of Germany	X		X
10.	21311	Statistics of students			X
11.	21371	Finance statistics of institutions of higher education, yearly	X	X	
12.	21372	Finance statistics of institutions of higher education, quarterly	X	X	
13.	21381	Key data on institutions of higher education		X	
14.	21811	Survey of expenditure, receipts and staff of public and state-subsidised institutions for science and research	X	X	
15.	21821	Reports on research and development for national purposes	X		
16.	21931	Survey of receipts and expenditures of non-government schools, including schools for nurses, midwives, etc.		X	
17.	22411	Statistics of home care services	X		
18.	22412	Statistics on in-patient care facilities (nursing homes)	X		
19.	22551	Statistics of expenditure and revenue of public child and youth welfare		X	
20.	23111	Resources and personnel data of hospitals	X		
21.	23112	Resources and personnel data of preventive care and rehabilitation facilities	X		
22.	23121	Cost data of hospitals	X		
23.	23611	Health expenditure accounts	X		

Serial No.	EVAS No.	Name	Production approach	Expenditure approach	Income approach
24.	31111	Statistics of building permits	X	X	
25.	31121	Statistics of construction work completed	X	X	
26.	31141	Statistics of demolition of buildings and dwellings	X	X	
27.	31211	Census of buildings and housing	X	X	
28.	41121	Agricultural structure survey	X		
29.	41215	Survey of vegetables	X		
30.	41221	Survey of tree nurseries	X		
31.	41231	Survey of tree fruit growing	X		
32.	41241	Reports on crop yields and holdings: field crops and grassland (incl. areas under cultivation and stocks)	X		
33.	41243	Reports on crop yields and holdings: fruit	X		
34.	41244	Reports on crop yields and holdings: vines and wine must	X		
35.	41246	Special coverage of crop yields and quality	X		
36.	41253	Grape harvest survey	X		
37.	41255	Survey of wine stocks	X		
38.	41261	Wood felling statistics (survey of wood-producing holdings)	X		
39.	41271	Main survey of land use	X		
40.	41312	Livestock survey – cattle	X		
41.	41313	Livestock survey – pigs	X		
42.	41314	Livestock survey – sheep	X		
43.	41322	Poultry statistics: survey in poultry slaughterhouses	X		
44.	41331	Statistics of slaughtering and slaughtering weights	X		
45.	41362	Survey of production in aquaculture businesses	X		
46.	42111	Monthly report incl. survey of orders received for local units in manufacturing, mining and quarrying	X	X	X
47.	42121	Monthly production survey in manufacturing, mining and quarrying	X		
48.	42131	Quarterly production survey in manufacturing, mining and quarrying	X	X	
49.	42151	Indices of orders received in manufacturing, mining and quarrying	X	X	
50.	42152	Indices of turnover in manufacturing, mining and quarrying	X	X	
51.	42153	Indices of production in manufacturing, mining and quarrying	X	X	
52.	42221	Annual report on enterprises in manufacturing, mining and quarrying	X		
53.	42231	Survey of investments in manufacturing, mining and quarrying	X		
54.	42241	Statistics of materials and commodities received in manuf., mining and quarrying		X	

Serial No.	EVAS No.	Name	Production approach	Expenditure approach	Income approach
55.	42251	Cost structure survey in manufacturing, mining and quarrying	X	X	
56.	42252	Structural survey of small enterprises in manufacturing, mining and quarrying	X	X	
57.	42271	Annual report for local units in manufacturing, mining and quarrying	X	X	
58.	43111	Monthly report covering enterprises in the fields of energy and water supply	X		X
59.	43221	Cost structure survey in the fields of energy supply, water supply, waste water and waste disposal, remediation activities	X	X	
60.	43311	Monthly report on electricity and heat generation for general supply by power generating plants	X		
61.	43331	Survey of electricity sales and sales proceeds of electricity suppliers and electricity sellers	X		
62.	43341	Survey of the generation and sale of gas and the sales proceeds of gas suppliers and gas sellers		X	
63.	44111	Monthly report in the building industry proper (incl. indices of orders received)	X	X	X
64.	44131	Quarterly survey in the finishing trade and with property developers	X		X
65.	44141	Statistics of orders on hand in the building industry proper (incl. indices)	X		
66.	44211	Annual survey incl. survey of investments in the building industry proper	X		
67.	44221	Annual survey including survey of investments covering enterprises of the finishing trade and property developers	X		
68.	44231	Supplementary survey in the building industry proper	X	X	
69.	44241	Annual survey in the finishing trade and with property developers	X		
70.	44252	Structural survey of small enterprises in the building industry	X	X	
71.	44253	Cost structure survey in the building industry proper	X	X	
72.	44254	Cost structure survey in the finishing trade	X	X	
73.	45211	Monthly statistics of wholesale trade and commission trade	X		
74.	45212	Monthly statistics of retail trade	X		
75.	45213	Monthly statistics of the hotel and restaurant industry	X		
76.	45214	Monthly statistics of motor vehicle sales incl. motor v. maintenance and repair	X		

Serial No.	EVAS No.	Name	Production approach	Expenditure approach	Income approach
77.	45341	Annual trade statistics (including motor vehicle maintenance and repair)	X	X	
78.	45342	Annual statistics of the hotel and restaurant industry	X	X	
79.	46131	Statistics of freight transport by rail	X		
80.	46141	Statistics of long-distance passenger transport by rail	X		
81.	46181	Quarterly statistics of commercial local passenger transport and of long-distance bus transport	X		
82.	46311	Statistics of enterprises in inland waterways transport	X		
83.	46411	Statistics of enterprises in air transport	X		
84.	47414	Short-term statistical surveys in the service sector	X		
85.	47415	Structural survey in the service sector	X	X	X
86.	48112	Business statistics encompassing a number of fields		X	
87.	51141	Intra-Community trade		X	
88.	51231	Extra-Community trade		X	
89.	52111	Business register system (URS)	X	X	
90.	52311	Statistics of business notifications	X		
91.	52411	Statistics of insolvency proceedings applied for	X		
92.	52431	Statistics of insolvency proceedings completed and discharge of remaining debts	X		
93.	52551	Cost structure statistics in other service branches	X	X	
94.	52571	Cost structure statistics in the medical sphere	X		
95.	53111	Crafts census	X	X	
96.	53211	Quarterly crafts report	X		
97.	61111	Consumer price index for Germany	X	X	
98.	61131	Retail Price Index	X	X	
99.	61211	Index of producer prices for agricultural products	X	X	
100.	61241	Index of producer prices for industrial products	X	X	
101.	61261	Price indices for the construction industry	X		
102.	61281	Index of selling prices in wholesale trade	X	X	
103.	61311	Producer price indices for transport and logistics services	X		
104.	61351	Consumer price indices for transport, postal and telecommunication services	X		
105.	61361	Producer price indices for business services	X		
106.	61411	Index of import prices	X	X	
107.	61421	Index of export prices	X		

Serial No.	EVAS No.	Name	Production approach	Expenditure approach	Income approach
108.	61511	Statistics of purchasing values of building land	X		
109.	62211	Statistics of agreed earnings			X
110.	62221	Quarterly index of agreed earnings and working hours		X	
111.	62321	Quarterly survey of earnings	X		X
112.	62411	Labour cost survey		X	X
113.	63111	Continuous household budget surveys: general information	X		
114.	63121	Continuous household budget surveys: household records	X		
115.	63211	Income and Consumption Sample Survey: general information			
116.	63221	Income and Consumption Sample Survey: household records			
117.	63231	Income and Consumption Sample Survey: detailed log book regarding food, beverages and tobacco products			
118.	63911	Time use survey of households (Article 7 of the Federal Statistics Law)	X		
119.	71211	Tax revenue statistics	X	X	
120.	71512	Quarterly cash results of the core budgets and of the extra budgets using cameralistic/double-entry accounting of the Federal Government (incl. EU shares), the federal states and social insurance	X	X	X
121.	71517	Quarterly cash results of the core budgets and of the extra budgets using cameralistic/double-entry accounting of the municipalities/associations of municipalities	X	X	
122.	71712	Accounting results of the core budgets, of the extra budgets using cameralistic/double-entry accounting and of other public funds, institutions and enterprises using cameralistic/double-entry accounting of the Federal Government (incl. EU shares), the federal states and social insurance	X	X	X
123.	71717	Accounting results of the core budgets, of the extra budgets using cameralistic/double-entry accounting and of the other public funds, institutions and enterprises using cameralistic/double-entry accounting of the municipalities/associations of municipalities	X	X	

Serial No.	EVAS No.	Name	Production approach	Expenditure approach	Income approach
124.	71811	Annual accounts of extra budgets using commercial accounting and of other public funds, institutions and enterprises using commercial accounting	X	X	
125.	73111	Wage and income tax statistics	X		
126.	73311	VAT (turnover tax) statistics (advance VAT returns)	X	X	
127.	73321	VAT (turnover tax) statistics (assessment)	X	X	
128.	74111	Personnel statistics of the public service	X		
129.	74113	Personnel statistics of the publicly controlled institutions and enterprises with private legal status	X		
130.	75111	Management of the group of respondents for statistics of public finance and personnel	X		
131.	79911	Statistics of tobacco tax	X	X	
132.	79921	Beer tax and sparkling wine tax statistics	X	X	
133.	79931	Energy tax statistics	X		
134.	79941	Statistics of spirits monopoly and spirits tax	X		
135.	81111	Production and uses of domestic product		X	
136.	81311	Government revenue and expenditure		X	
137.	81411	External economic transactions		X	
138.	81511	Input-output accounts	X	X	
139.	83111	Balance of payments statistics (Deutsche Bundesbank)	X	X	X
140.	87111	Socio-economic reporting system	X		

10.2 Other official data sources

Serial No.	Name	Production approach	Expenditure approach	Income approach
1.	Annual report of the Institute for Federal Real Estate, Bonn (BIMA)	X		
2.	Statistical report by the Bundesnetzagentur (Federal Network Agency)	X		
3.	Annual report of the Bundesmonopolverwaltung für Branntwein (Federal Spirits Board)	X		
4.	Fees of the Gebühreneinzugszentrale (the German TV licensing office)	X		
5.	Annual financial statements of the Bundesanstalt für Telekommunikation (Federal Telecommunications Agency)	X		
6.	Annual report of ARD (Public-service broadcasting consortium, also responsible for TV and radio advertising)	X	X	X
7.	Legal stock-holding obligation/accounting for the food supplies of the BLE (Bundesanstalt für Landwirtschaft und Ernährung / Federal Agency for Agriculture and Food)		X	
8.	Annual report of the Deutschen Patent- und Markenamt (DPMA) (German Patent and Trademark Office)		X	
9.	Payments to freelance artists by the Künstlersozialkasse (the Artists' Social Security Fund)		X	
10.	Bundesbank gold price statistics		X	
11.	Bundesbank monthly report		X	
12.	Aircraft inventories of the Luftfahrtbundesamt (LBA) (Federal Aviation Authority)		X	
13.	Motor vehicle statistics from the Kraftfahrt-Bundesamt (Federal Office for Motor Vehicles)		X	
14.	Special Statistical Publication by the German Bundesbank: "Extrapolated information from the annual financial statements of German companies"	X	X	
15.	Bundesagentur für Arbeit, Zentralstelle für Arbeitsvermittlung (ZVA) (Federal Employment Agency - Central Placement Office): monthly work permits issued to seasonal workers			X
16.	Income of commuters, Eurostat, national accounts			X
17.	Employees of the allied forces (Federal Ministry of Finance)			X
18.	Information for commuters (German Bundesbank)			X
19.	Agricultural accounts of the Bundesanstalt für Landwirtschaft und Ernährung (Federal Agency for Agriculture and Food)	X		

Serial No.	Name	Production approach	Expenditure approach	Income approach
20.	Monthly report of the Versorgungsanstalt des Bundes und der Länder (Federal and State Government Employees Retirement Fund): Levies and contributions			X
21.	Number of Riester contracts (Bundesministerium für Arbeit und Soziales / Federal Ministry of Labour and Social Affairs)			X
22.	Negotiated wages (German Bundesbank)			X
23.	Bond portfolio of the Deutsche Rentenversicherung (German pension insurance scheme)			X
24.	Seizure of illegal drugs by the Bundeskriminalamt (Federal Bureau of Criminal Investigation, BKA)	X	X	
25.	Statistics for other financial institutions (German Bundesbank)	X	X	
26.	Insurance statistics for primary insurance and reinsurance undertakings from the Bundesanstalt für Finanzdienstleistungsaufsicht (Federal Financial Supervisory Authority)	X	X	
27.	Budget of the Bundesanstalt für Finanzdienstleistungsaufsicht (Federal Financial Supervisory Authority)	X	X	
28.	Salaries of soldiers serving abroad from the Bundesministerium der Verteidigung (Federal Ministry of Defence)	X		
29.	Monthly overview of the Bundesministerium der Verteidigung (Federal Ministry of Defence)	X		
30.	Personnel statistics from the federal police force	X		
31.	Number of employees of the Bundesanstalt für Post und Telekommunikation (Federal Postal and Telecommunications Agency)	X		
32.	Personnel figures from the Bundeseisenbahnvermögen (Federal Railways)	X		
33.	Monthly report of the pension insurance body for miners, railway workers and seamen/the Minijob-Zentrale (part-time job centre)	X		
34.	Employment figures of the Bundesanstalt für Finanzdienstleistungsaufsicht (Federal Financial Supervisory Authority)	X		
35.	Report by the German Bundesbank on employees in German credit institutions	X		
36.	Niedersächsisches Landesamt für Bodenforschung (Geological Survey of Lower Saxony): Gas and oil deposits in Germany		X	

Serial No.	Name	Production approach	Expenditure approach	Income approach
37.	Lending by German asset-backed lending businesses from the Zentralverband Deutscher Pfandkreditgewerbe (Confederation of German Asset-backed Lending Businesses)	X	X	
38.	EMU interest rate statistics from the German Bundesbank and the European Central Bank	X	X	
39.	Aggregate income statement of the guarantee banks of the German Bundesbank	X	X	
40.	Aggregate income statement of the investment companies of the German Bundesbank	X	X	
41.	Annual report of Deutsche Bundesbank	X	X	
42.	Statistics on the income statement of the banks of the German Bundesbank	X	X	
43.	Banking statistics of Deutsche Bundesbank	X	X	
44.	Monthly overview of volunteers on voluntary national service, Bundesamt für Familie und Zivilgesellschaftlichen Aufgaben (BFZA) (Federal Agency for Family and Civil Society)	X		
45.	Federal Ministry of Finance: Standard amounts for benefits in kind	X		

10.3 Other data sources

Serial No.	Name	Production approach	Expenditure approach	Income approach
1.	Annual reports of the lottery companies	X		
2.	Annual report of the Deutsche Reiseverband (DRV) (German Travel Association)	X		
3.	Annual report of the BMW Group	X		
4.	Annual report of the Leasing-Benz-Bank of the Mercedes-Benz-Bank	X		
5.	Annual report of Volkswagen Leasing GmbH	X		
6.	Annual report of the Musical Performance and Mechanical Reproduction Rights Society (GEMA)	X	X	
7.	Hop market report by the Verband Deutscher Hopfenzüchter (Association of German Hop Growers)	X		
8.	KBV statistics from the Kassenärztliche Bundesvereinigung (KBV) (National Association of Statutory Health Insurance Physicians)	X		
9.	Remuneration report from the Kassenärztliche Bundesvereinigung (KBV) (National Association of Statutory Health Insurance Physicians)	X		
10.	Results of doctor statistics for the BÄK and the KBV, from the Bundesärztekammer (German Medical Association)	X		
11.	Yearbook of the Kassenzahnärztlichen Bundesvereinigung (National Association of Statutory Health Insurance Dentists)	X		
12.	Statistics from the Kassenzahnärztlichen Bundesvereinigung (National Association of Statutory Health Insurance Dentists)	X		
13.	Data report from the Verband der privaten Krankenversicherung (PKV-Verband) (Private Health Insurance Association)	X		X
14.	Statement of accounts from the Verband der privaten Krankenversicherung (PKV-Verband) (Private Health Insurance Association)	X		
15.	CI practice panel of the Zentralinstitut für die kassenärztliche Versorgung in Deutschland (ZI) (Central Research Institute of Ambulatory Health Care in Germany)	X		
16.	Veterinary surgeon statistics from the Bundestierärztekammer (BTÄK) / Deutsches Tierärzteblatt (National Association of Veterinary Surgeons / German Veterinary Surgeons Magazine)	X		
17.	Annual statement of the information platform of the German transmission system operators	X		

Serial No.	Name	Production approach	Expenditure approach	Income approach
18.	Solarenergie Förderverein Deutschland (German Association for the Promotion of Solar Power): International Economic Forum on Renewable Energies	X		
19.	Annual report of Deutsche Bahn AG	X		
20.	Annual report of DB Regio AG	X		
21.	Annual report of DB Netz AG	X		
22.	Annual report of German Air Traffic Control	X		
23.	Annual report of DB Station & Service AG	X		
24.	Annual report of Lufthansa AG	X		
25.	Business surveys and business cycle indicators from the BME association (Bundesverband Materialwirtschaft Einkauf und Logistik e.V. / Federal Association of Materials Management, Purchasing and Logistics)		X	
26.	Zentralverband der deutschen Werbewirtschaft (Central Association of the German Advertising Industry, ZAW): Advertising in Germany		X	
27.	Energy balances of the Working Group on Energy Balances		X	
28.	Annual report of Deutsche Telekom AG	X		
29.	Monthly survey of inventory assessments by the Ifo Institute		X	
30.	Inventories of the Erdölbevorratungsverband (Petroleum Stockholding Association, EBV)		X	
31.	German steel recycling statement from the Bundesvereinigung Deutscher Stahlrecycling- und Entsorgungsunternehmen e.V. (Federal Association of German Steel Recycling and Disposal Companies)		X	
32.	R&D surveys by the Stifterverband für Deutsche Wissenschaft (Donors' Association for German Science)		X	
33.	District heating overview from the Energieeffizienzverband für Wärme, Kälte und Kraft-Wärme-Kopplung (Energy Efficiency Association for Heating, Cooling and Cogeneration)	X		
34.	Annual statistics compiled by the Bundesverband deutscher Wohnungs- und Immobilienunternehmen e.V.	X	X	
35.	German Entertainment and Media Outlook 2006-2010 by Pricewaterhouse Coopers		X	
36.	Sales database of the Deutsche Reiseverband (German Travel Association)		X	

Serial No.	Name	Production approach	Expenditure approach	Income approach
37.	Gesamtverband der Deutschen Versicherungswirtschaft e.V. (German Insurance Association): "German life insurance in figures"			X
38.	Study: "Retirement provision in Germany" by TNS Infratest for the Deutsche Rentenversicherung Bund (German Pension Insurance Union) and the Federal Ministry of Labour and Social Affairs			X
39.	Annual report of the Pensions-Sicherungs-Vereins (Pension Protection Association)			X
40.	Analyses of the annual statistics of Wohnungs- und Immobilienunternehmen e.V. (Federal Association of German Housing and Real Estate Enterprises)	X		
41.	Prevalence of drug consumption by type of drug from the Epidemiologische Suchtsurvey (Epidemiological Survey on Addiction, ESA)	X	X	
42.	Wholesale prices for drugs by the Deutsche Beobachtungsstelle für Drogen und Drogensucht (German Monitoring Centre for Drugs and Drug Addiction, DBDD)	X	X	
43.	Cigarette price information by state, from the Deutsche Zigarettenverband (German Cigarette Association, DZV)/British American Tobacco (BAT)	X	X	
44.	Waste disposal study by the Deutsche Zigarettenverband	X	X	
45.	Annual report of the Versorgungsanstalt des Bundes und der Länder (Federal and State Government Employees Retirement Fund)	X	X	
46.	Statistics from the Arbeitsgemeinschaft berufsständischer Versorgungswerke (ABV) (Consortium of Professional Association Pension Schemes)	X	X	
47.	Statistical information supplied by Deutsche Post AG	X		
48.	Report by Deutsche Telekom AG on number of employees	X		
49.	Group statistics for the Postbank	X		
50.	ifo Institute for Economic Research: Survey of gardening and landscaping firms		X	
51.	Institut für Handelsforschung, University of Cologne Report comparing estate agents' enterprises		X	
52.	Deutsche Bahn AG, DB Cargo AG, annual financial statements	X		
53.	Deutsche Bahn AG, DB Reise und Touristik AG, annual financial statements	X		
54.	Deutscher Verkehrsflughäfen business data	X		

Serial No.	Name	Production approach	Expenditure approach	Income approach
55.	Deutsche Post annual report	X		
56.	Book publication, "The Book and the Book Trade in Figures" by the Börsenverein des deutschen Buchhandels e.V. (German Publishers and Book Sellers Association)		X	
57.	Annual report of the Deutsche Börse Group	X	X	
58.	Statistical data from the Arbeitsgemeinschaft kommunale und kirchliche Altersversorgung (AKA) – Fachvereinigung Zusatzversorgung (the Consortium of Municipal and Church-run Pension Provision – Professional Association for Supplementary Provision)	X	X	
59.	Profit and loss account, contributions and services of the Arbeitsgemeinschaft berufsständischer Versorgungswerke (ABV) (the Consortium of Professional Association Pension Schemes)	X	X	
60.	Monthly survey on the domestic cement industry by the Verein Deutscher Zementwerke e.V. (German Cement Works Association)	X		
61.	Wirtschafts- und Sozialwissenschaftliches Institut in der Hans-Böckler-Stiftung (WSI) Information on tariff policy			X
62.	German Institute for Economic Research (DIW): Socio-Economic Panel (SOEP)	X		