

Production index for industry

Base 2015=100



2021

Periodicity: annual
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Further information are available via:
www.destatis.de/kontakt
Telephone: +49 (0) 611 / 75 44 75

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- None

1 General information on the statistics

1.1 Statistical population

The statistics refer to sections B, C, D and F (without D 353) of the Classification of Economic Activities (WZ 2008). These sections are summarised (in a simplified manner) under the term "industry".

1.2 Statistical unit

The following applies to the calculation of index numbers:

Presentation unit: results are published for classes (four-digit items) of the Classification of Economic Activities (WZ 2008).

Survey unit: usually, the underlying data are collected from local production units with 50 or more persons employed of enterprises in manufacturing or other enterprises.

Tabulating unit: for the purpose of processing the collected data, local kind-of-activity units are typically formed as tabulating units. A kind-of-activity unit includes all activities of a local unit which belong to the same class (four-digit item) of the Classification of Economic Activities. By contrast, however, the following applies to the calculation of the weighting pattern: both the survey and tabulating units are enterprises (legal units).

1.3 Reference area

The results are published by the Federal Statistical Office for the whole of Germany.

1.4 Reference period

The data relate to the production of the entire reference month.

1.5 Frequency of data collection

The production indices are released on a monthly basis.

1.6 Legal acts and other agreements

Council Regulation (EC) No 1165/98 of 19 May 1998 concerning short-term statistics, Regulation (EC) No 1158/2005 of the European Parliament and of the Council of 6 July 2005 amending Council Regulation (EC) No 1165/98 concerning short-term statistics, Regulation (EC) No 1893/2006 of the European Parliament and of the Council of 20 December 2006 (OJ L 393 of 30 December 2006, p. 1), and Industry Statistics Act (ProdGewStatG) in the version promulgated on 21 March 2002 (Federal Law Gazette I, p. 1181), last amended by Article 1 of the Act of 5 December 2012 (Federal Law Gazette I, p. 2466)

1.7 Confidentiality

1.7.1 Confidentiality - policy

The confidentiality rules of the relevant surveys apply to the basic data underlying the calculations; they are described in the respective quality reports.

1.7.2 Confidentiality - data treatment

There are no confidentiality procedures in place as this set of statistics is an accounting system based on aggregated results of the underlying basic data.

1.8 Quality management

1.8.1 Quality assurance

The data collection and calculation process provides for several phases in which the statistical offices of the Federation and the Länder revise the results available at the time. Aspects of data collection and processing are discussed at the annual expert meetings of representatives from the statistical offices of the Federation and the Länder. The decisions taken are laid down in the minutes of the expert meetings.

1.8.2 Quality assessment

The results are generally based on monthly surveys of more than 20,000 local units and therefore are largely characterised by high accuracy. The provisional results are less precise as there are still estimates.

There are still some gaps in the data basis regarding construction (building completion work) and energy supply (electricity supply).

The comparability over time may be impaired on account of structural changes which occurred in the relevant period (e.g. changes in the way local units report their data), see section 6.2. Besides, the index results are subject to the conflicting requirements of rapid availability, accuracy, and revisions. First survey results are still incomplete and have to be supplemented by estimates. If they were provided earlier still, they would inevitably contain an even larger share of estimates, thereby necessitating more extensive revisions

2 Content and user needs

2.1 Statistical presentation

2.1.1 Data description

The production indices for industry can be regarded as a calculation system used for the monthly updating of gross value added at constant prices that was measured in the economic branches in the base year.

2.1.2 Classification system

The results are presented in a breakdown by economic activity in accordance with the Classification of Economic Activities (WZ 2008). In addition, a breakdown by main industrial grouping is used (see Commission Regulation (EC) No 656/2007).

The data are collected in a technical (subject-related) breakdown based on the Product Classification for Production Statistics (GP 2019).

2.1.3 Statistical concepts and definitions

The production indices reflect the ratio of the current price adjusted production values to the corresponding values in the base year. For instance, a production index value of 110 means that the price adjusted production is 10% higher than in the base year.

The overall index is constructed as the weighted average of the results for individual economic branches. The weights reflect gross value added at factor cost in the individual economic branches in the base year. The index is constructed as a fixed-base index which is rebased every five years. The weights are maintained for five years to make sure that structural shifts between the economic branches have no impact on the index development during that period.

As a rule, the indices are published as volume indices to eliminate the effects of price changes.

The following applies to the calculation of the weighting pattern: gross value added at factor cost comprises the value of all produced goods and services at market prices - less all intermediate consumption. So it is the value added to intermediate consumption by processing.

The derivation is based on the following scheme:

Total turnover from own products, resale of goods and other activities (excl. turnover tax)

+ changes in stocks of work in progress and finished products of own production (e.g. production for stock)

+ own-account production of fixed assets

= gross production value (total output), excl. turnover tax

- material consumption, input of goods for resale, cost of contract work

= net production value, excl. turnover tax

- other intermediate consumption (e.g. industrial or craft services, agency workers, rents)

= gross value added, excl. turnover tax

- other taxes linked to production (e.g. real property tax, motor vehicle tax, excise duties)

+ subsidies on current production

= gross value added at factor cost

2.2 User needs

The indices are important indicators of short-term economic development in Germany on account of their early availability, monthly periodicity, detailed breakdown by economic branch and country of destination, the clear cyclical development in manufacturing, and the strong interrelationship between manufacturing and industry-related services. In addition, they are used for extrapolation purposes in the quarterly national accounts.

Main users include the federal ministries, the European Central Bank, the Deutsche Bundesbank, Eurostat and other international institutions, business associations, enterprises, research institutes, universities, and the general public.

2.3 User satisfaction

The interests of the main users are represented by the Statistical Advisory Committee and by the bodies it appoints. Pursuant to Section 4 of the Federal Statistics Act, the Committee advises the Federal Statistical Office on fundamental issues. The Statistical Advisory Committee consists of representatives from the federal ministries, the German Supreme Audit Institution and the Deutsche Bundesbank, the heads of the statistical offices of the Länder and the Federal Commissioner for Data Protection, representatives from central municipal organisations, trade and industry, the liberal professions, employers' associations, trade unions, and from agriculture, economic institutes and higher education institutions. There is also regular direct contact with the Deutsche Bundesbank and the Federal Ministry for Economic Affairs and Energy.

3 Statistical processing

3.1 Source data

For the calculation of index numbers:

Monthly and quarterly production surveys in manufacturing, mining and quarrying (EVAS Nos. 42121 and 42131), monthly report on local units in manufacturing, mining and quarrying (42111), monthly report on the main construction industry (44111), administrative data from the turnover tax survey, monthly report on local units in energy and water supply (43111), and publications on electricity generation of transmission system operators

For the calculation of the weighting pattern:

Cost structure survey in manufacturing, mining and quarrying (42251), structural survey of small enterprises in manufacturing, mining and quarrying (42252), cost structure survey in the main construction industry (44253), cost structure survey of building completion work (44254), structural survey of small enterprises in construction (44252), cost structure survey of energy supply (43221)

For price adjustment:

Index of producer prices of industrial products, domestic sales (61241), price indices for the construction industry (61261)

3.2 Data compilation

In a first step, index numbers of production are calculated for roughly 5,000 industrial products based on the Product Classification for Production Statistics (GP 2019). Using the gross production value proportions of the base year 2015, the index numbers are then aggregated to obtain indices for economic branches as defined in the Classification of Economic Activities. The level of detail of the branch indices is that of classes (four-digit headings) of the Classification of Economic Activities. A total of 246 branch indices are calculated for the production index.

In a next step, these branch indices are aggregated to form indices at higher levels of breakdown (aggregates). An aggregated index is constructed as the weighted average of the branch indices included. Weights are also referred to as weighting factors and the total of weights of an index as its weighting pattern or structure. The weights reflect gross value added at factor cost in the relevant branches of economic activity.

The indices are rebased every five years to base years ending in 0 or 5 for reasons of international comparability. Regular rebasing is required in particular for the updating of weights. This is to account for structural changes in Germany's economy that took place in the previous years. Rebasing includes the recalculation of indices as of January of the new base year and the linking of these indices to indices of earlier years that were moved to the new base year beforehand.

The base year is changed about two years after the end of the base year period. When the rebased index is released, the index values published previously are revised as of January of the new base year. As regards the indices of periods before January of the new base year, rebasing causes changes in the index level while the change rates (change on the previous month and on the same month a year earlier) remain unchanged.

3.3 Adjustment

For price adjustment purposes, the indices are divided by suitable price indices (producer price indices, construction price indices), where necessary. Price adjustment is made at the level of aggregated product types (seven-digit headings) of the Product Classification for Production Statistics (GP 2019) before branch indices are calculated. Price adjustment is not made where quantities or other variables are used to calculate index numbers for the production index.

As a rule, results are published in a calendar and seasonally adjusted form. To enable year-on-year comparisons, additional results are provided that are merely calendar adjusted. The original (not seasonally adjusted) values can also be retrieved. For seasonal adjustment purposes, influences that occur regularly and to a similar extent in the course of the year are eliminated from the time series by means of the mathematical-statistical method X 13 JD+. The purpose is to highlight the short-term economic, trend and extraordinary developments. The procedure may also include calendar adjustment to eliminate predictable calendar influences.

For seasonal adjustment, version 2.2 of the JDemetra+ software is used. It is recommended for seasonal adjustment within the European Statistical System and the European System of Central Banks. The underlying mathematical-statistical method does not differ fundamentally from the previous X-12-ARIMA procedure.

The first stage of the procedure is RegARIMA modelling; unadjusted values at the ends are extended by estimates and, where required, adjusted for outliers. Extending the time series by estimates is required, for instance, for the second stage of the procedure, where centred moving averages are calculated. Seasonal adjustment as such is carried out in the second stage of the procedure. It is an iterative process for smoothing the unadjusted data by means of trend and seasonal filters which are calculated from centred weighted moving averages. The seasonal factors of a specific month are obtained by smoothing the deviations of the unadjusted values from the trend values of that month. The trend values, in turn, are smoothed unadjusted values.

There may also be calendar adjustment in the first stage. For that purpose, the number of working days in the current month is determined after deducting holidays; the result is compared with the long-term average of that period. Public

holidays that are relevant only in some Länder are weighted using the number of employees in those Länder as a proportion of the total number of employees in Germany. The percentage effect of an additional working or trading day on the unadjusted value is estimated from past values of the relevant set of statistics under RegARIMA modelling. These estimates are used to eliminate the impact of variations in the number of working days in the respective month or quarter from the unadjusted data. The effects of bridging days (days between a public holiday and a weekend), movable school holidays and the weather are not taken into account.

Results based on the calendar and seasonal adjustment procedure BV4.1 and trend results according to BV4.1 are published in addition to the results adjusted for calendar and seasonal effects using the X13 JD+ procedure.

3.4 Cost and burden

As the calculations use data that are available, there is no additional response burden for enterprises and local units. Information on the response burden caused by the collection of the underlying basic data is contained in the quality reports of the respective statistics.

4 Accuracy and reliability

4.1 Overall accuracy

The corrected results for the index numbers are based on monthly surveys of more than 20,000 local units and therefore are largely characterised by high accuracy. The provisional results are less precise as there are still estimates. There are still some gaps in the data basis regarding construction (building completion work) and energy supply (electricity supply).

The calculation of weighting factors for enterprises with at least 20 persons employed is based on a similar scope of business data, while the data missing for smaller enterprises must be estimated. This impairs the accuracy of the weighting information especially in the construction industry.

4.2 Sampling error

The main data sources for calculating the index numbers are the monthly and quarterly production surveys and, in addition, the monthly reports on manufacturing, construction, and energy supply. These data sources can be regarded as reliable and precise as the surveys are conducted in the form of censuses with a cut-off threshold. However, the preliminary survey results used for the calculation of provisional indices include a rather high degree of nonresponse. As monthly survey data are not available for building completion work, administrative data from the turnover tax survey must be used for this part of construction, although these data are still very incomplete at the time the provisional index results are calculated. Because survey data are neither available for electricity supply as part of energy supply, an approximation based on publications of the transmission system operators has to be used.

Various data regarding the cost structure of small enterprises with less than 20 persons employed are missing for the calculation of the weighting pattern. They must be estimated in the context of calculating gross value added.

4.3 Data revision

4.3.1 Data revision - policy

Indices of a base year:

A first provisional index result is published within 38 days after the end of the reference month. If necessary, the provisional result will be revised one month later (t+68) and published as the corrected result. All other corrections of the reference year are accounted for once a year in an annual revision. The results of the annual revision of the original (not seasonally adjusted) values are published in May of the subsequent year at the latest; then they are final.

Rebasing of unadjusted indices:

In addition to the above-mentioned revisions, the base year is changed every five years, about two years after the end of the base year period. When the rebased index is released, the index values published previously are revised as of January of the new base year. As regards the indices of periods before January of the base year, rebasing causes changes in the index level while the change rates (change on the previous month and on the same month a year earlier) remain unchanged.

Seasonally adjusted indices:

Additional revisions can also occur due to calendar and seasonal adjustments. All calendar and seasonal factors are estimated one year in advance. As a rule, the estimated factors are used for current adjustment.

Regarding the results for main industrial groupings, there are monthly checks to ensure that the factors are representative. Where necessary, they are re-estimated. Such re-estimation may cause changes in the adjusted current results, but also in earlier results. Results of past periods may be revised back to January of the base year; earlier results are not revised.

4.3.2 Data revision - practice

Unadjusted indices of a base year:

At the time the provisional index result is calculated, nonresponse is still high for the survey data on which the index calculation is based. Missing data are estimated. These estimates are replaced by the more complete survey data available four weeks later. The corrected index thus calculated is published together with the provisional index of the following month. Later reporting updates are accounted for when the annual revision is carried out.

Rebasing of unadjusted indices:

When an index is rebased, the weights are updated and, where necessary, methodological changes are implemented.

Seasonally adjusted indices:

The aggregates of the main industrial groupings and divisions of economic activity are subjected to monthly checks to ensure that the seasonal factors are still representative, while the factors of other aggregates are checked once a year.

4.3.3 Data revision - analysis

A revision difference is measured as the difference between the last published and the first published value of the previous month's rates. Usual revision measures are the "mean revision (MR)" and the "mean absolute revision (MAR)", which determine the arithmetic mean of the observed deviations. In the MAR, the sign is not taken into account. Further information can be found in the article: Analyse der Revisionen ausgewählter Konjunkturindikatoren, in: Statistisches Bundesamt, Wirtschaft und Statistik 5/2009, pp. 406-415.

On the basis of the mean revision, the previous month's rates of the non-seasonally adjusted production index in industry were revised by an average of 0.2 percentage points. Regarding the mean absolute revision, the relevant value is 0.4 percentage points. For the previous month's rates of the seasonally adjusted production index in industry, the mean revision is 0.2 and the mean absolute revision 0.5 percentage points (period: reference month January 2018 to reference month August 2021).

5 Timeliness and punctuality

5.1 Timeliness

As provisional results are published within 38 days after the end of the reference month, the indices provided are quite up-to-date when they are released. These are quantitative results based on data collected for the target variables from a representative number of local units. More recent information on economic performance is only available as qualitative results based on estimates (not official statistics, e.g. surveys of managers). The provisional results are revised if necessary and published as corrected results (t + 68). The results of the annual revision regarding the (non-seasonally adjusted) original values are published no later than May of the following year and are then final.

5.2 Punctuality

Release dates are scheduled for a whole year and published in advance in the release calendar of the Federal Statistical Office. There was 100% adherence to time schedules in the last few years; results could always be released on the dates published.

6 Comparability

6.1 Comparability - geographical

The statistics are based on regulations of the European Union; the underlying concepts and definitions are the same in all Member States. Therefore, the results are generally comparable across all EU Member States.

6.2 Comparability over time

The time series with monthly values starts from January 1991, the individual time series values refer to the end of the respective reference month. However, only the indices of a base year can be compared over time. There has been no break in the time series since the current base year 2015 (length of the time series with comparable values: 76; status: May 2021; the value is increased by one for each additional month until the next base changeover). Structural changes, for instance due to changes in the way local units report their data, are eliminated by adjusting the reference variable of the branch indices where this can be done with the information available.

In formal terms, the indices of different base years are comparable over time.

Changes in the weighting structures, classifications (changeover to WZ 2008 and 2005 as the new base year), the groups of respondents and the territorial status impair the analysis of long time series that include indices of different base years.

7 Coherence - cross domain

The indices can be combined with the results of other economic statistics where these relate to the Classification of Economic Activities (WZ 2008).

8 Dissemination and communication

8.1 Dissemination format

News release

The first results are published in a press release (www.destatis.de/presse).

Publications

None.

Online database

Upon publication of the press release, the results can also be accessed in table 42153 of the GENESIS-Online database (www.destatis.de/genesis).

Micro-data access

The calculation is based on aggregated data of the source statistics.

Other

The index results are shown in "Short-term indicators": www.destatis.de › Themes › Economy › Short-term indicators.

The cyclical development of the index is shown in the "Business cycle monitor": www.destatis.de › Themes › Economy › Short-term indicators › Business cycle monitor

8.2 Documentation on methodology

Papers on the subject of index calculation have been published in the scientific journal "Wirtschaft und Statistik" of the Federal Statistical Office. See for example: Linz, Stefan; Möller, Hans-Rüdiger; Mehlhorn, Peter: Umstellung der Konjunkturindizes im Produzierenden Gewerbe auf das Basisjahr 2015, in: Statistisches Bundesamt, Wirtschaft und Statistik 2/2018. (English translation available: Rebasing the short-term indices for industry to the year 2015).

8.3 Release policy

Release calendar

Release dates are scheduled for a whole year and published in advance in the release calendar of the Federal Statistical Office.

Release calendar access

The annual release calendar is provided on the website of the Federal Statistical Office at www.destatis.de/presse › Annual release calendar.

User access

Online via www.destatis.de.

9 Comment

None.