



## METHODOLOGICAL EXPLANATION

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# INDICES OF INDUSTRIAL PRODUCTION, TURNOVER AND STOCKS IN INDUSTRY

This methodological explanation relates to the data releases:

- Indices of industrial production, Slovenia, monthly (First Release)



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## 1 PURPOSE

The purpose of the industrial production index (IPI) is to monitor current monthly changes of industrial production value in Slovenia, which is calculated on the basis of production value. The IPI shows developments in value added at factor costs in the observed month. The goal of the monthly measuring is early detection of changes in economic development. The IPI is suitable for short-term observation and analyses of economic development.

The purpose of the turnover index is monthly observation of trends in turnover in enterprises and establishments working in industry. It is an important indicator that shows current demand for industrial products and services and current developments in sales in domestic and foreign markets.

The purpose of the stock index is to monitor changes in stocks. It indirectly shows the production and sale dynamics.

The key statistics are the value turnover index and the industrial production index.

## 2 LEGAL FRAMEWORK

- [Annual Programme of Statistical Surveys \(LPSR\)](#) (only in Slovene)
- [National Statistics Act](#) (OJ RS, No. 45/95 and 9/01)
- Regulation (EU) 2019/2152 of the European Parliament and of the Council of 27 November 2019 on European business statistics, repealing 10 legal acts in the field of business statistics (CELEX: 32019R2152)

## 3 UNIT DESCRIBED BY THE PUBLISHED DATA

Units described by the published data are industrial production, turnover in industry and stocks in industry. All three units are linked to the territory of the Republic of Slovenia. Units are studied according to the Standard Classification of Activities, version 2008 (SKD 2008).

## 4 SELECTION OF OBSERVATION UNIT

Observation units are enterprises and their units performing one or more activities from sections Mining and quarrying (B), Manufacturing (C) and Electricity, gas, steam and air conditioning supply (D) of the Standard Classification of Activities (version 2008). Group 35.3 Steam and air conditioning supply is excluded.

Enterprises converting electricity from high to low voltage, distributing it through transmission lines and taking care of the maintenance of electrical networks,

generate turnover, i.e. network charges charged to electricity buyers, while enterprises buying electricity from producers and selling it on to users are not included in the survey.

The main activity of the enterprise is the statistical activity defined in the Statistical Business Register for statistical purposes, and is in some cases different from the registered activity defined in the Business Register of Slovenia, kept by AJPES. The statistical activity is determined for the major units that have different main activity based on existing statistical data than is registered main activity.

Observation units are chosen in the survey based on threshold coverage where the number of persons employed and annual turnover are the two main criteria. The survey covers all industrial enterprises and establishments with at least 18 (if the enterprise was included in the survey in the previous year) or 22 persons (if the enterprise is included in the survey in the current year for the first time) in paid employment according to the Statistical Register of Employment. The limit for annual turnover is a minimum of EUR 420,000 and is taken into account for the units that reported in the previous year.

The stratum is determined according to the 2-digit NACE Rev. 2. In cases where such selection did not provide enough units within a particular activity of the Standard Classification of Activities, industrial enterprises and establishments with fewer than 18 persons in paid employment were included. In this way the survey covers 75% of employees in sections B, C and D of the Standard Classification of Activities (version 2008). Each year approximately 2,000 observation units are included in the survey.

## **5 SOURCES AND METHODS OF DATA COLLECTION**

Data are collected monthly.

The source of data on turnover and stocks in industry is the monthly questionnaire on "Turnover and Value of Stocks in Industry" (IND-PN/M). Data are collected by an online questionnaire "Turnover and Value of Stocks in Industry" (IND-PN/M).

Reporting units are obliged to deliver the requested data for the previous month to the Statistical Office no later than the 20th of the month. Observed units fill in the data electronically via the eSTAT web application.

In the case of non-response from the observation unit, the administrative source of data is being used. These are the data being reported by enterprises to the Financial Administration of the Republic of Slovenia for the value added tax purpose (DDV-O forms). These data are available to the Statistical Office approximately 45 days after the reference period.

## 6 DEFINITIONS

**Industrial production index (IPI)** reflects developments in value added and is calculated from turnover and stocks of finished and unfinished goods. It is observed for sections Mining and quarrying (B), Manufacturing (C) and Electricity, gas, steam and air conditioning supply (D), excluding group 35.3, according to SKD 2008.

**Turnover in industry** is published only for sections Mining and quarrying (B) and Manufacturing (C) according to SKD 2008, but data are also collected for section Electricity, gas, steam and air conditioning supply (D), excluding group 35.3. Turnover in industry includes incomes from:

- Sales of manufactured industrial products and sales of industrial services in the observed month for which the enterprise issued an invoice,
- Sales of products manufactured by subcontractor,
- Sales of by-products (for example: sawing in manufacture of wood),
- Sales of produced and/or supplied electricity and gas.

Turnover does not include value added tax.

The data on turnover for activity 35 also include network charges.

Enterprises involved in the distribution of electricity report only turnover from network charges, but not from the resale of electricity. The same applies to enterprises engaged in gas resale.

The following other operating incomes are excluded from turnover: commissions, leases and rentals, leases for own production units and machines, if used by third parties, leases of company-owned dwellings, receipts for licence-fees, receipts from staff facilities (for example from a factory canteen), the supply of products and services within the observation unit, sales of own land and fixed assets, sales or leases of own properties, sales of share, interest receipts and dividends, subsidies, other extraordinary income, incomes from sales of merchandise and credits.

Total turnover in industry consists of domestic and non-domestic turnover. Data on non-domestic turnover are collected and published also for the euro area and the non-euro area.

Domestic turnover includes turnover generated on the territory of the Republic of Slovenia.

Non-domestic turnover includes turnover generated with the sale to consumers from foreign countries (not the Republic of Slovenia).

Euro area turnover includes turnover generated with the sale to consumers from countries that introduced euro. It is not important knowing in which currency the sale is carried out.

**The stock index** is calculated from the data on the value of stocks of finished and unfinished goods. Reporting units report the stocks according to the Slovenian Accounting Standards. Stocks of finished and unfinished production at the end of the observed month are taken into consideration. Stocks of merchandise and material are excluded.

## 7 EXPLANATIONS

### 7.1 CLASSIFICATIONS

Data are published according to the Standard Classification of Activities, version 2008 (SKD 2008), published on SURS's website:

<http://www.stat.si/statweb/en/Methods/Classifications>

in a form of SKD search engine or as a complete classification under Economic classification.

Data are combined and published according to special groups referring to divisions and groups according to SKD 2008.

#### **Main industrial groupings**

##### A Intermediate goods industries

- AE Energy related industries (divisions 5, 6, 19 and 35)
- AI Intermediate goods industries (divisions 7, 8, 9, 16, 17, 22, 23, 24, groups 10.6, 10.9, 13.1-13.3, 20.1-20.3, 20.5, 20.6, 25.5-25.9, 26.1, 26.8, 27.1-27.4 and 27.9)

B Capital goods industries (divisions 28, 29, 33, groups 25.1-25.4, 26.2, 26.3, 26.5, 26.6, 30.1-30.4 and 32.5)

##### C Consumer goods industries

- CD Durable consumer goods industries (division 31, groups 26.4, 26.7, 27.5, 30.9, 32.1 and 32.2)
- CN Non-durable consumer goods industries (divisions 11, 12, 14, 15, 18, 21, groups 10.1-10.5, 10.7, 10.8, 13.9, 20.4, 32.3, 32.4 and 32.9)

#### **Technological complexity** (only for IPI for section C Manufacturing)

- VTZ High-technology manufacturing (divisions 21, 26 and group 30.3)
- SVTZ Medium-high-technology manufacturing (divisions 20, 27, 28, 29, groups 25.4, 30.2, 30.4, 30.9 and 32.5)
- SNTZ Medium-low-technology manufacturing (divisions 19, 22, 23, 24, 33, groups 18.2, 25.1-25.3, 25.5-25.9 and 30.1)

NTZ Low-technology manufacturing (divisions 10, 11, 12, 13, 14, 15, 16, 17, 31, groups 18.1, 32.1-32.4 and 32.9)

## 7.2 DATA PROCESSING

### DATA EDITING

Data were statistically edited with appropriate imputation procedures. The following imputation methods were used: *logical imputations, mean imputations, average-ratio imputations, historical imputations and calculated value imputations.*

Part of the data in the cases of unit non-response is imputed with the help of administrative data on value added tax (VAT). In such examples, VAT data are used as input on which previously listed imputation procedures are performed.

For more, see the general methodological explanations [Statistical data editing](#).

### WEIGHTING

Weights (shares of value added at factor costs) are used when aggregating the data and at the calculation of the IPI for the higher levels of classification. Shares are based on the data on value added (source structural statistics) and from 2005 on are calculated for each year as soon as the new data on value added are available.

### SEASONAL ADJUSTMENT

In addition to unadjusted data series, seasonally adjusted data series are published from January 2000 on (base year 2021).

With the index of industrial production, 18 time series are seasonally adjusted. With the turnover in industry, 55 time series are seasonally adjusted. With the value of stocks, 10 time series are seasonally adjusted. All time series are seasonally adjusted directly.

For seasonal adjustment of time series, we use the TRAMO/SEATS method. A time series model is set up, which is revised in detail and corrected about once a year. Using the model the time series is decomposed into:

- The trend-cycle component, which consists of the trend and cyclical movements over a period longer than one year,
- The seasonal component, which consists of the seasonal effects and the calendar effects; the calendar effects are composed of the working day effect, the leap-year effect, the holiday effect and the Easter effect,
- The irregular component, which consists of random fluctuations and some outliers.

Seasonally adjusted data are original data from which the seasonal and calendar effects are eliminated. For more, see the general methodological

explanations [Seasonal adjustment of time series](#).

### 7.3 INDICES

#### Calculation of industrial production index (IPI)

The theoretical formula for an index of production (Q) is a Laspeyres type volume index:

$$Q_t^I = \frac{\sum_{i=1}^N p_{i,0} \times q_{i,t} - \sum_{j=1}^{M(t)} \alpha_{j,0} \times \delta_{j,t}}{\sum_{i=1}^N p_{i,0} \times q_{i,0} - \sum_{j=1}^{M(0)} \alpha_{j,0} \times \delta_{j,0}}$$

where  
 q = quantity of outputs  
 p = prices of outputs  
 α = prices of inputs  
 δ = quantity of inputs  
 i = one of the N outputs  
 j = one of the M outputs  
 0 = base period  
 t = current period

However, since all the data needed to calculate such an index are not available, in practice, suitable proxies are used.

The basis for calculating the IPI is data on the value of production, which is calculated according to the following formula:

Value of production in the month<sub>x</sub> = turnover in the month<sub>x</sub> + value of stocks in the month<sub>x</sub> - value of stocks in the month<sub>x-1</sub>

Value of production is deflated at the 4-digit level of SKD 2008 with producer price indices of manufactured goods on domestic and non-domestic market, so that it is derived from the deflated value of variables (turnover, stocks) for each of the reporting units.

Example of deflating the value of turnover (TOV) for month x:

$$\text{real TOV}_x = \frac{\text{nominal TOV}_x}{I_{\text{price},x/2005}}$$

Weights are used when aggregating the data and at the calculation of the IPI for the higher levels of classification.

The index is calculated using the following steps:

1. The calculation of aggregated IPI for the month x on the average of the previous year (Y-1) for each industrial group (s):

$$\text{agreg IPIs}(x) = \frac{\text{value of production (x)}}{\Phi \text{value of production (Y - 1)}} * 100$$

Industrial groups are defined so that activities at the 3-digit level of SKD 2008 that are classified into the same 2-digit activity level and MIG are merged into an individual industrial group.

2. The calculation of the IPI for the higher levels of aggregation (including total, sections, main industrial groupings), example for total industry:

$$\text{IPI Total (x)} = \frac{\sum \text{ws(x)} * \text{IPIs(x)}}{\sum \text{ws(x)}} = \frac{\text{ws1} * \text{IPIs1(x)} + \text{ws2} * \text{IPIs2(x)} + \dots + \text{wsn} * \text{IPIsn(x)}}{\text{ws1} + \text{ws2} + \dots + \text{wsn}}$$

In this way the index for the current month to the average of the previous year is calculated directly from the value of production. All other indices that we publish are calculated directly from this index by chaining.

### Calculation of turnover index and stocks index

In contrast to IPI, the turnover index and the stocks index are unweighted indices. The index for the current month to the average of the previous year is calculated directly from the data and all other indices are derived.

## 7.4 PRECISION

In statistical surveys different kinds of errors can occur (e.g. sampling error, non-response error, measurement error) influencing the reliability and accuracy of the statistical results. Errors deriving from the random mechanisms determine the precision and consequently the reliability of the statistical estimates. The precision of the statistical estimate is estimated by calculating the standard error (SE). The Statistical Office of the Republic of Slovenia draws attention to less reliable estimates by flagging them with a special sign.

If the table contains estimated indices, publishing limitations are determined by the standard errors of the estimates (SE) of the indices. In such cases it holds:

If the standard error (SE) of the estimate of a proportion is

- 10 or below (SE ≤ 10), the estimate is reliable enough and is published without limitations;
- between 10 and up to 30 (10 < SE ≤ 30), the estimate is less reliable and is flagged for caution with letter M;
- over 30 (SE > 30), the estimate is too unreliable to be published and therefore suppressed for use by letter N.

For more, see the general methodological explanations [Precision of statistical estimates](#).

## 7.5 OTHER EXPLANATIONS

The value of industrial production, turnover and the value of stocks are published in a form of indices:

- fixed base indices (current month compared to the average of 2021, which is a base year),
- movable base indices (current month compared to the previous month, compared to the same month of the previous year and the monthly average of the current year compared to the monthly average (the same months) of the previous year).

At recalculations slight differences compared to the data published in other publications can appear due to the rounding of indices.

Data that are statistically protected to respect the confidentiality of reporting units are replaced with the letter »z«.

## 8 PUBLISHING

- SiStat Database: [Industry - Production and turnover in industry](#). Data are published in the form of indices (unadjusted and seasonally adjusted) according to SKD 2008.
- First Release (Industry, Production and Turnover in Industry): "Indices of industrial production, Slovenia, monthly".
- Statistical office of the European Union (Eurostat).
- Bank of Slovenia (BS).
- International Monetary Fund (IMF).

## 9 REVISION OF THE DATA

### 9.1 PUBLISHING OF PRELIMINARY AND FINAL DATA

Data for the last six months are provisional. With each release provisional data can be replaced with new, revised data.

Publishing of provisional and final data is planned. Due to the needs of users for timely information, provisional data are published that meet the criteria of the quality of official statistical data but do not meet the quality that can be met with complete coverage. Data are revised when recent, more complete and better data can significantly contribute to the quality of data-based decision-making.

### 9.2 FACTORS INFLUENCING COMPARABILITY OVER TIME

From 2009 on indices are calculated and published according to SKD 2008, while indices for the period before 2009 were calculated according to SKD 2002. In 2009 all series from 1998 on were recalculated to the new classification of activities.

Information about some important differences between the old and the new classification is published on the website

[http://www.stat.si/dokument/5380/Razlike\\_SKD2008\\_SKD2002.pdf](http://www.stat.si/dokument/5380/Razlike_SKD2008_SKD2002.pdf) (only in Slovene).

In 2013 in the process of deflation of non-domestic turnover, euro area turnover and non-euro area turnover we replaced deflation using producer price indices of manufactured goods on domestic market with deflation using producer price indices of manufactured goods on non-domestic market. We took the new deflator into account for indices from January 2010 on. Consequently, time series for non-domestic turnover, euro area turnover, non-euro area turnover and industrial production indices for some activities and aggregates can be slightly changed from January 2010 on.

Each year for seasonal adjustment of time series for the value of industrial production, turnover and value of stocks time series models were carefully revised and, if necessary, completed, taking into account the period from January 2005 on (for the value of stocks from January 2004 on). Seasonally adjusted data before January 2005 will therefore remain unchanged.

In January 2017 we started publishing industrial production indices according to technological complexity. Because it is aggregated weighted index, we used the same weights as for other higher levels of IPI.

Regardless of changes of factors that have influence on the data, there are no breaks in time series, so all points in time are comparable.

Methodological explanation on revision of statistical data is available on

<https://www.stat.si/dokument/5299/RevisionOfStatisticalDataMEgeneral.pdf>.

## 10 OTHER METHODOLOGICAL MATERIALS

Methodological materials on SURS's website are available at <https://www.stat.si/statweb/en/Methods/QuestionnairesMethodologicalExplanationsQualityReports>.

- Questionnaire (Slovene only):
  - Turnover and Value of Stocks in Industry (IND-PN/M)

Theme: Industry, SubTheme: Production and Turnover in Industry

- Quality report for the survey:
  - Turnover and Value of Stocks in Industry (IND-PN/M)

Theme: Industry, SubTheme: Production and Turnover in Industry