

# INDUSTRIAL PRODUCTION INDEX

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## OUTLINE

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- Coverage and data sources
- Questionnaire and components
- Analysis process
- Weights and classifications

## OUTLINE

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- Clasifications PRODCOM and Nace Rev.2
- Imputation
- Revision policy
- Reasons of the base year change
- Publication
- Exchanging ideas on SDG 9

## Purpose of the IPI calculation

It is the objective of the production index to measure changes in **the volume of output** at close and regular intervals, normally monthly. It provides a measure of the volume trend in value added over a given reference period. The production index is a theoretical measure that must be approximated by practical measures.

### Why IPI is needed;

- to measure the developments in the industrial field of the economy
- We can measure the effects of the economic policies implemented, as IPI enables the impact of the decisions taken to be measured in a short time.

## Data Collection

- Monthly Industrial Production Survey data are provided by enterprises via Web-based data entry program.

## Coverage and data sources

- Whole Turkey
- Classification coverage (NACE 2)
  - B-Mining and quarrying
    - 05-Mining of coal and lignite
    - 07-Mining of metal ores
    - 08-Other mining and quarrying
  - C- Manufacturing
    - 10-33

## Coverage and data sources

- D- Electricity, Gas, Steam and Air Conditioning Supply
- **Unrecorded activity;** 35.12, 35.13, 35.14, 35.2, 35.3 and 09 sectors of NACE Rev.2 are not covered.

## Coverage and data sources

- The main data sources of IPI is survey.
  - Monthly Industrial Production Questionnaire
  
- The size of the enterprise within the sector is taken as a basis.
  
- enterprises whose turnover constitutes 70% of the total turnover (at the four-digit level classification according to NACE 2)



## Coverage and data sources

- Administrative records (Turkish Revenue Administration)
  - The information of the enterprises that are not surveyed are taken from the administrative records
  - The turnover information obtained from the declarations of the companies is used

## Coverage and data sources

- In addition, enterprises that are not covered but have activities within the coverage of B and C in the annual Prodcom data and that have made significant production value for their sector are also included in the coverage.

## Coverage and data sources

- The Industrial Production Index with 2015=100 reference years is calculated with the production values from approximately 7 thousand enterprises and the production value estimates obtained from the turnover of more than 300 thousand firms from the Revenue Administration.

## Coverage

- Enterprises to be covered are evaluated every year
- The information of the enterprises is collected in November and December, if appropriate, it is included in the index calculation in January.

# Monthly Industrial Production Questionnaire

## ➤ Production Information

- Prodcom (Product classification 10 digit)
- Product definition (e.g., raw milk, bread, etc.)
- Measurement code (e.g., meter, tone, kg)
- Production quantity
- Production value
- Sold quantity
- Sold value
- stock

# Monthly Industrial Production Questionnaire

- Turnover Information
  - Total turnover
  - Domestic turnover
  - Non-domestic turnover
  - Other income

## Definitions

**Quantity of production:** It is the quantity of production which is produced either in the enterprise or produced in another enterprise by giving raw material of the enterprise in the consistent month. The subcontracting by using other enterprises raw materials is not included.

## Definitions

**Value of Production:** It is the value of production which is produced either in the enterprise or produced in another enterprise by giving raw material of the enterprise in the consistent month. While sales unit price is used for production value calculation for enterprises which questionnaire is applied, the turnover data calculated from the Revenue Administration data is used for the production value of firms that are not covered by the survey.



## Definitions

**Quantity of Sales:** The quantity of sales includes the products which are produced by another enterprise or produced by another enterprise with the raw materials of the enterprise which is included in survey and sales from the stocks of the enterprise and the products given to other departments of the enterprise in the consistent month. The commercial goods sold without any changes on them are not included.

## Definitions

**Value of Sales:** The value of sales includes the value of the products (by using unit price) which are produced either in the enterprise or by another enterprise with the raw materials of the enterprise which is included in survey and sales from the stocks of the enterprise and the products given to other departments of the enterprise in the consistent month.

## Definitions

**Producer's Price:** Producer's price received by a producer for a unit of a good including any tax payable or subsidy receivable on the product as a consequence of its sale or use except invoiced VAT, Special Consumption Tax. It also excludes any delivery charges invoiced separately by the producer.

## Definitions

**Turnover (VAT excluded):** Turnover comprises the total value of goods and services invoiced by enterprise in reference month, and this corresponds to market sales of goods and services supplied to third parties. Turnover includes invoiced by unit vis-a-vis its customer (exception of VAT and deductible taxes linked to turnover) other all taxes and duties. Turnover also includes all other charges (transport, packaging, etc.) passed on to the customer, even if these charges are listed separately in the invoice.

## Definitions

Turnover does not include price decline, discount and allowance, recycling package. The income which is classified in the company's account as other business income, financial income and extraordinary income are excluded in turnover. Business subventions obtained from the government are also excluded.

## Accounting Convention

### Variables:

- Production quantity
- Number of days worked
- Production value

## Accounting Convention

### ➤ Production quantity

In the index calculation the production quantity is used in sectors; 05- Mining of coal and lignite, 06- Extraction of crude petroleum and natural gas, 12- Manufacture of tobacco products and 35.11- Production of electricity.

## Accounting Convention

### ➤ Total number of days worked

Total number of days worked obtained from the data of Social Security Institution is used in sectors; 30.11- Building of ships and floating structures, 3012- Building of pleasure and sporting boats and 30.20- Manufacture of railway locomotives and rolling stock.



## Accounting Convention

### ➤ Production value

In the index calculation deflated production value is used for other sectors.

## Accounting Convention

**Deflator:** Domestic and non-domestic producer prices

**Type of index:** Chained Laspeyres Index method (weighted) is used.

## Classifications used

### PRODCOM:

- Prodcom provides statistics on the **production of manufactured goods** carried out by enterprises on the national territory of the reporting countries. The term comes from the French "PRODUCTION COMMUNAUTAIRE" (Community Production). Prodcom covers **mining, quarrying and manufacturing**: sections B and C of the Statistical Classification of Economy Activity in the European Union (NACE 2). Prodcom statistics aim at providing a full picture at EU level of developments in industrial production for a given product or for an industry in a comparable manner across countries.

## Classifications used

### PRODCOM:

Prodcom statistics may be used to answer such questions as:

- Which countries are specialized in the production of a given product?
- How productive is a particular industry in terms of physical volume and the value of production sold during a year?
- Which country has the lowest or the highest value per unit for the production of a certain product?
- Is there a shift or a trend in the manufacture of a group of products over the years?

## Classifications used

### PRODCOM

PRODCOM statistics consist of the following set of indicators:

- the physical **volume** (kg, m<sup>2</sup>, number of items, etc.) of production sold,
- the **value** of production sold,
- the physical volume of actual production, including any production which is incorporated into the manufacture of other products from the same undertaking.

## Classifications used

Prodcom headings are coded using an eight-digit numerical code, the first six digits of which are identical to those of the **Statistical Classification of Products by Activity** (CPA) code.

07.10 Mining of  
iron ores

07.10.10 Iron ores

07.10.10.10 Iron ores and concentrates.  
Non-agglomerated  
(excluding roasted iron  
pyrites)

07.10.10.20 Iron ores and  
concentrates.  
Agglomerated (excluding  
roasted iron pyrites)

## Classifications used

07.10 Mining of  
iron ores

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07.10.10.10 Iron ores and concentrates.  
Non-agglomerated  
(excluding roasted iron  
pyrites)

### PRODTR

07.10.10.00.01	Iron-Tuvenan
07.10.10.00.02	Iron-Shopped (piece)
07.10.10.00.03	Iron-Piece
07.10.10.00.04	Iron Powder
07.10.10.00.05	Iron Concentrated
07.10.10.00.06	Iron Sinter
07.10.10.00.07	Iron Pellet

## **NACE 2**-Statistical classification of economic activities in the European Community

NACE is the European standard classification of productive economic activities.

NACE presents the universe of economic activities partitioned in such a way that a NACE code can be associated with a statistical unit carrying them out.

An economic activity takes place when resources such as capital goods, labour, manufacturing techniques or intermediary products are combined to produce specific goods or services.



## **NACE 2**-Statistical classification of economic activities in the European Community

Thus, an economic activity is characterized by an input of resources, a production process and an output of products (goods or services).

An activity as defined here may consist of one simple process (for example weaving), but may also cover a whole range of sub-processes, each mentioned in different categories of the classification (for example, the manufacturing of a car consists of specific activities such as casting, forging, welding, assembling, painting, etc.).

## **NACE 2**-Statistical classification of economic activities in the European Community

If the production process is organized as an integrated series of elementary activities within the same statistical unit, the whole combination is regarded as one activity.

## **NACE 2**-Statistical classification of economic activities in the European Community

The structure of NACE is described in the NACE Regulation as follows:

- i. a first level consisting of headings identified by an alphabetical code (sections),
- ii. a second level consisting of headings identified by a two-digit numerical code (divisions),
- iii. a third level consisting of headings identified by a three-digit numerical code (groups),
- iv. a fourth level consisting of headings identified by a four-digit numerical code (classes)

# Determination of the main activity of the Unit

**The top-down method** follows a hierarchical principle: the classification of a unit at the lowest level of the classification must be consistent with the classification of the unit at the higher levels of the structure.

To satisfy this condition the process starts with identification of the relevant highest level and progresses down through the levels of the classification in the following way:

- a. Identify the section which has the highest share of the value added.
- b. Within this section identify the division which has the highest share of the value added.
- c. Within this division identify the group which has the highest share of the valued added.
- d. Within this group identify the class which has the highest share of value added.

## Determination of the main activity of the Unit

A unit carries out the following activities (shares in terms of value added):

Section	Division	Group	Class	Description of the class	Share
C	25	25.9	25.91	Manufacture of steel drums and similar containers	10%
	28	28.1	28.11	Manufacture of engines and turbines, except aircraft, vehicle and cycle engines	6%
		28.2	28.24	Manufacture of power-driven hand tools	5%
		28.9	28.93	Manufacture of machinery for food, beverages and tobacco processing	23%
			28.95	Manufacture of machinery for paper and paperboard production	8%
G	46	46.1	46.14	Agents involved in the sale of machinery, industrial equipment, ships and aircraft	7%
		46.6	46.61	Wholesale of agricultural machinery, equipment and supplies	28%
M	71	71.1	71.12	Engineering activities and related technical consultancy	13%

## Determination of the main activity of the Unit

- Identify the main Section among
 

Section C - Manufacturing	52%
Section G - Wholesale and retail trade; repair of motor vehicles and motorcycles	35%
Section M - Professional, scientific and technical activities	13%
  
- Identify the main Division within main Section C:
 

Division 25	Manufacture of fabricated metal products, except machinery and equipment	10%
Division 28	Manufacture of machinery and equipment n.e.c.	42%
  
- Identify the main Group within the main Division 28:
 

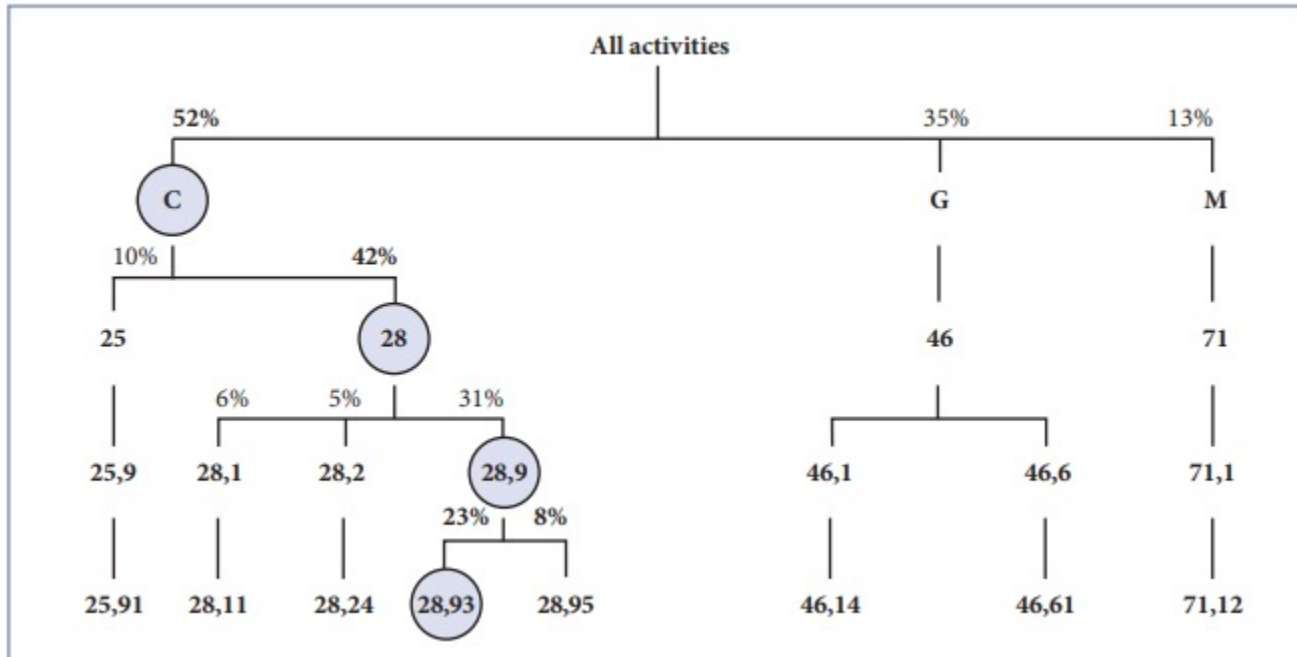
Group 28.1	Manufacture of general-purpose machinery	6%
Group 28.2	Manufacture of other general-purpose machinery	5%
Group 28.9	Manufacture of other special-purpose machinery	31%
  
- Identify the main Class within the main Group 28.9:
 

Class 28.93	Manufacture of machinery for food, beverages and tobacco processing	23%
Class 28.95	Manufacture of machinery for paper and paperboard production	8%

# Determination of the main activity of the Unit

The correct class is 28.93 Manufacture of machinery for food, beverages and tobacco processing, although the class with the biggest share of value added is class: 46.61 Wholesale of agricultural machinery, equipment and supplies.

# TOP-DOWN





## Accounting Convention

$$I_{L(m,t)} = \left( \prod_{s=1}^{t-1} \frac{\sum \bar{p}_{s-1} q_s}{\sum \bar{p}_{s-1} \bar{q}_{s-1}} \right) \times \frac{\sum \bar{p}_{t-1} q_{t,m}}{\sum \bar{p}_{t-1} \bar{q}_{t-1}}$$

$m$ : y

$t$ : year

$I_{L(m,t)}$ : t. year m. month index

$q$ : quantity

$p$ : price

# Accounting Convention

Reference year: 2015

Reason of base year change;

The relative importance of the various economic activities in the country changes over time.

The switch to the new base consists of two steps: the **rebasing**, i.e. the update of the weights used for the calculation of indices from base year 2010 to 2015;

## Accounting Convention

and the **re-referencing (or rescaling)** of the indices to a new reference, from 2010=100 to 2015=100. Both steps can be done at the same time but they can also be done independently from each other.

In the calculation of an index the **base year** is the year with which the values from other years are compared. The index value of the base year is conventionally set to equal 100.

# Accounting Convention

**Nature of weights:** Up to the level of the section according to NACE Rev. 2 classification (2 -digit level) weights obtained from the Annual Industrial and Service Statistics are used. For the upper-level indices National Accounts value added is used as a weight. For each level t-2 periods weights are used.

# Imputation

## Treatment of missing data

In nonresponse situation, the annual rate of change of the enterprises are used for imputation.

## Procedures for nonresponse

Non-responding units are followed up on telephone or by interviewers. When a unit refuses to respond, the unit is reminded of its legal obligation to respond, and legal procedure begins.

## Publication

- Monthly (t+43)
- The published data is temporary, and data for the last two months is revised every month. When the December press release is published, data for the last one year are revised.

## Revision Policy

### For the Unadjusted Series;

- 1) When publishing the current month indices last two-month indices will be revised.
- 2) In the January press releases, last two years indices will be revised.



## Revision Policy

**For the Seasonal and Calendar Adjusted Series;**

- 1) Revisions are implemented on the data of the last three years excluding the current year
- 2) At the end of the year the model structure of the series, model parameters and the outlier observation structure will be changed if the method requires change.

## Publication

Adjusted data has been published in three different ways.

1- “Calendar adjusted” data is derived from unadjusted data by removing calendar and holiday originated effects. Calendar adjusted data should be used in comparisons regarding the same month/period of the previous year.

## Publication

2- “Seasonally adjusted” data is derived from unadjusted data by removing effects originating from seasonal effects. Seasonally adjusted data should be used in comparisons regarding the previous month/period.

## Publication

3- If unadjusted data contains both calendar and holiday, and seasonal effects, “seasonally and calendar adjusted” data is derived by removing these effects. Seasonally and calendar adjusted data should be used in comparisons regarding the previous month/period.

## Publication

The details of data which are disseminated in press release are given below:

- 1- Monthly Industrial Production Index
- 2- Calendar adjusted Monthly Industrial Production Index
- 3- Seasonally and calendar adjusted Monthly Industrial Production Index
- 4- Calendar Adjusted Percentage Change over the Same Month of the Previous Year
- 5- Seasonal and Calendar Adjusted Percentage Change over the Previous Month
- 6- Influence of divisions on upper index change

## Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

*Target 9.2: Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries*

- **Indicator 9.2.1:** Manufacturing value added as a proportion of GDP and per capita
- **Indicator 9.2.2:** Manufacturing employment as a proportion of total employment

## Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

*Target 9.3: Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets*

- **Indicator 9.3.1:** Proportion of small-scale industries in total industry value added
- **Indicator 9.3.2:** Proportion of small-scale industries with a loan or line of credit

## Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

*Target 9.b: Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities*

**Indicator 9.b.1:** Proportion of medium and high-tech industry value added in total value added



## Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

*Target 9.b: Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities*

**Indicator 9.b.1:** Proportion of medium and high-tech industry value added in total value added

## Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

### ➤ Necessary data

- Social Security
- Revenue administration data
- Banking Regulation and Supervision Agency data
- National account data for GDP
- Specific survey such as investment expenditure survey

## Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

### ➤ Necessary indicators

- Employment data
- Manufacturing Value Added (MVA)
- GDP
- Production data

*For further questions*

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