



مركز الإحصاء  
STATISTICS CENTRE

# Industrial Production Index Methodology

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## Overview

The Industrial Production Index (IPI) is a statistical economic indicator that measures change in industrial production (manufacturing industries) in two time periods, namely: the base period, which is the period in which the index value is set at 100, and the comparison period in which quantities are compared to the quantities of the base period.

## Importance

- The index reveals the productivity trends of industrial producers inside the Emirate of Abu Dhabi to help decision-makers, policy-makers and researchers to make sound decisions that support the industry sector to grow and developed over time.
- It is an economic indicator that measures the change in the production quantities of industrial producers. The government uses this index to process and create economic plans and strategies.
- It is a deflator that measures the change of a series of economic indicators over time. It is used to deflate economic data for national accounts of quantitative changes in the volume of production .
- It is a tool for monitoring and estimating the total demand of raw materials of the inputs in the intermediate consumption of industrial production in sales and purchase contracts, especially in future contracts in which the payment (point) date is set in the future.
- It is used by international economic organizations, such as the International Monetary Fund (IMF), as a tool for comparison and evaluation purposes.

## Objectives

- Provide the necessary data to assist decision makers, policy makers and researchers to plan and take decisions that support the industrial sector.
- Provide the necessary data to process and formulate economic policies and plans.
- Provide the data needed to process time series of the contributing economic data.
- Monitor the emergency escalation in sales and purchase contracts.

## Concepts and Definitions

**Index:** It is a statistical tool for measuring the change in the quantities of industrial production (manufacturing industries)

**Quantity:** The quantity produced during the reference period.

**Comparison period:** The "current" or most recent period in which the index was calculated. However, the term is used to refer to any period that is compared to the base.

**Base period:** The year in which the index equals 100. The base period serves as a benchmark for future periods, allowing economists to measure rates of increase and decrease in quantities compared to that year.

**Quarterly relative quantities change:** The increase or decrease rate in the basket items average production quantities of the current quarter compared to the basket items average production quantities of the previous quarter or the same quarter of the previous year

**Laspeyre Equation:** is a mathematical equation developed by statisticians (Laspeyre) to calculate index numbers.

## Coverage (Geographical- Statistical Units)

The Industrial Production Index covers all activities of the manufacturing sector in the Emirate of Abu Dhabi, it represents all the second digit levels manufacturing activities according to the International Standard Industrial Classification of All Economic Activities (ISIC4). A total of 23 industrial activities were selected to represent the manufacturing sector.

## Frequency

The Industrial production Index report is issued on a quarterly basis.

## Classifications

The International Standard Industrial Classification of All Economic Activities (ISIC4) is used, which represents all manufacturing activities at the second level.

ISIC4	Manufacturing Industry
10	Manufacture of food products
11	Manufacture of beverages
13	Manufacture of textiles
14	Manufacture of apparel
15	Manufacture of leather and other related products
16	Manufacture of wood, wood products, and cork, except for furniture; manufacture of items from straw and plaiting materials
17	Manufacture of paper and paper products
18	Printing and reproduction of recorded media
19	Manufacture of coke and refined petroleum products
20	Manufacture of chemicals and chemical products
21	Manufacture of pharmaceuticals, chemical, and botanical pharmaceutical products
22	Manufacture of rubber tires and tubes as well as renewing and rebuilding the external surfaces of rubber tires
23	Manufacture of other non-metallic minerals products
24	Manufacture of base metals
25	Manufacture of formed metal products, except machinery and equipment
26	Manufacture of computers and electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment unclassified elsewhere
29	Manufacture of motor vehicles, trailers, and semi-trailers
30	Manufacture of other transportation equipment
31	Manufacture of furniture
32	Other manufacturing industries
33	Repair and installation of machinery and equipment

## Main Data Sources

The main source of data is the field survey conducted by the Income and Prices section at the Statistics Centre - Abu Dhabi. The quantities of 284 products are collected from 65 establishments at the second digit level. The sample distribution covers 52 establishments in the Abu Dhabi region and 13 establishments in the Al Ain region.

## Questionnaires

A special form was designed to collect prices and quantities of industrial production based on the data required from the establishment.

## Sample Design

The survey uses the Probability Proportional to Size (PPS) sampling method in which a size measure is available for each establishment unit before sampling and where the probability of selecting a unit is proportional to its size, in the case of the Industrial Production Index, the economic establishment is usually measured by the number of workers. In addition, when choosing the sample economy by the sampling method proportional to the size, a greater probability or opportunity was given for selecting the establishments with the largest number of employees.

Establishments from the Economic Surveys of 2011 were approved for use in the calculation of weights for the Industrial Production Index according to the classification ISIC4, and 284 products that represent economic activities were identified.

## Data Collection

Produced quantities are collected monthly through field visits or by e-mail communication according to prior coordination with the establishment and the explanation of the form items and the data required by trained enumerators.

## Data Editing

The editing phase aims to validate all data to ensure consistency. It also includes comparison of the quantities against the quantities, and the quantities of the month with the previous month to avoid input mistakes, collection errors and incorrect specification of products.

- **Desk Editing of Quantities:**

1. Following up and daily discussion of the enumerator before he goes to the field to collect data.
2. The quantities collected by the enumerators in the field and the data sent by e-mail are tracked and monitored before being entered and then compared to the previous months. If any unjustified difference in the quantities is observed, whether in the increase or decrease, they shall be returned to the source, whether in the field or by e-mail, to avoid any errors.
3. Automated editing rules for quantities changes have been set that displays the good/ service whose quantities exceed the predefined limit of percentage change. The limits set are based on data from previous years of the establishments

## Indicators Calculation

### First: Calculation of Weights

The Industrial Production Index basket weights are important variables in the index calculation process. The Industrial Production Index was based on the results of an economic survey implemented by the Industry and Business Statistics using a sample representative of the Emirate of Abu Dhabi. The following main points were considered during the weights calculation process:

- The weight of the economic activity according to (the second level of the industrial classification) is based on the total revenues of all establishments.
- The establishment's weight in economic activity was calculated by dividing the establishment's revenues by the revenues of all establishments.
- Following the first visit to the sample establishments and determination of the main important goods and services produced within each establishment, the establishment's weight was distributed over its main commodities based on the production value of each good/ service.
- The following equation was used to calculate the weight based on revenue:  
Establishment's Weight = Establishment's total revenues / Grand total of revenues for all establishments \* 100
- Weights are updated whenever the necessary data are available. SCAD seeks to update the weights every two years.

### Second: Data Processing

Classification, coding, application of auditing and validation rules, approval of raw data, imputation of missing values, and inter-linking of variables from multiple sources are all part of the data processing stage. In addition, depending on the imputation and treatments methods included in the International Monetary Fund's Industrial Production Index Manual, calculating weights and computing aggregate results from the main and subsidiary data.

### Third: Calculation of the Index

The Industrial Production Index is calculated according to the mathematical formula of the Laspeyre formula. The Index is based on the weights of the base year (2012).

$$IPI_L = \sum \frac{Q_{1i}}{Q_{0i}} \times W_{0i}$$

IPI = Industrial Production Index

Q1 = Current quantity

Q0= Base year quantity

W0 = Weight for the base year

The quarterly production index is obtained by aggregation of the monthly product quantities during the three months. Then the quantity relative is calculated at the product level within each establishment. Next, the higher levels are compiled through the weights of the products within the same economic activity.

#### **Fourth: Calculation of the Relative Change**

The relative change in the index number for the current quarter compared with the previous quarter is calculated according to the following equation:

$$RC = \frac{IPI_c}{IPI_p} * 100 - 100$$

RC = Quarterly or annual rate of change

$IPI_c$  = Index for the current quarter

$IPI_p$  = Index for the previous quarter / the same quarter of the previous year

#### **Timeliness**

The industrial production index issued during the quarter that follows the end of the reference quarter.

#### **Dissemination**

The industrial production index (IPI) data is published through the website of the Statistics Centre - Abu Dhabi.





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