OUTLINE OF THE INDICES OF INDUSTRIAL PRODUCTION

1. Base year

The base year of the indices in this report is 2005, meaning that all indices are represented as the ratios to the average of 2005（=100.0）and the composition ratios of weights are based on the industrial structure of 2005.

2. Classification

There are two kinds of indices: indices classified by industry and indices classified by use of goods.

（1）Indices classified by industry

（a）Indices of Production, Shipments, Inventory, and Inventory Ratio

Some of the classification items of the Standard Industrial Classification for Japan（JSIC rev. 11), on which the classification by industry in this report is based, is rearranged as follows for the sake of convenience（industrial category numbers are indicated in brackets）. The basic classification is shown on Table 1.

① Chemical industry = Chemical industry（17）－ Chemical fiber manufacturing industry（174）

② Textile industry = Textile industry（11）+ Clothing and other textile based products manufacturing industry（12）+ Chemical fiber manufacturing industry（174）

③ Food and tobacco industry = Food manufacturing industry（09）+ Beverages, tobacco, and feed manufacturing industry（10）

④ Other industries = Rubber products manufacturing industry （20）+ Tanned leather, tanned leather based products, and fur products manufacturing industry（21）+ Furniture and house equipment manufacturing industry（14）+ Printing and allied industry（16） + Wood and wood products manufacturing industry（13）+ Other manufacturing industry（32）

⑤ Mining, which is one of the divisions in JSIC, is classified in this report as one industry because of its small weight.

⑥ Machinery industry = General machinery manufacturing industry（26）+ Electric machinery manufacturing industry（27）+ Information equipment and communication electronics manufacturing industry（28）+ Electronics parts and devices manufacturing industry（29）+ Transport equipment manufacturing industry（30）+ Precision instruments manufacturing industry（31）

⑦ Electric machinery industry（1995 version）= Electric machinery manufacturing industry（27） + Information equipment and communication electronics manufacturing industry（28） + Electronics parts and devices manufacturing industry（29）

In order to correspond to the 12th revision of JSIC, indices of industries that have undergone changes of classification are also published as reference.

(b) Indices of Operating Ratio and Production Capacity and Indices of Production Forecast
The above-mentioned industrial classifications are also applied to these indices. Table 1 shows the basic classification of industries for all industrial indices.

Table 1: Classification by industry

Industries	Indices of Industrial Production, Shipments, Inventory, and Inventory Ratio	Indices of Operating Ratio and Production Capacity	Indices of Production Forecast
Mining and manufacturing	○	×	×
Manufacturing	○	○	○
Iron and steel	○	○	○
Non-ferrous metals	○	○	○
Fabricated products	○	○	○
General machinery	○	○	○
Electrical machinery	○	○	○
Information and communication electronics equipment	○	○	○
Electronic parts and devices	○	○	○
Transport equipment	○	○	○
Precision instruments	○	○	×*
Ceramics, stone, and clay products	○	○	×*
Chemicals	○	○	○
Petroleum and coal products	○	○	×*
Plastic products	○	×	×
Pulp, paper, and paper products	○	○	△
Textiles	○	○	×*
Food and tobacco	○	×	×
Other manufacturing	○	○	○*
Rubber products	○	×*	×*
Leather products	○	×	×
Furniture	○	×*	×
Printing	○	×	×
Wood and wood products	○	×*	×*
Other products	○	×	×
Mining	○	×	×
(Reference)			
Industries (Mining, manufacturing, electricity, gas)	○	×	×
Manufacturing (excl.Machinery industry)	×	○	×
Machinery industry	○	○	×
Electrical machinery (1995 version)	○	○	×
Electricity and gas	○	×	×
General-purpose machinery	○	×	×
Production machinery	○	×	×
Business oriented machinery	○	×	×
Ceramics, clay and stone products (2008 version)	○	×	×
Textiles (2008 version)	○	×	×
Other manufacturing (2008 version)	○	×	×

Products with an asterisk are partly or wholly classified in "Other Manufacturing" or "Others"
△ = Pulp&paper products , ○* = Other

(2) Indices by Use of Goods: Indices of Production, Shipments, Inventory, and Inventory Ratio

In compiling indices by use of goods, goods to be re-input into production are classified as "Producer Goods," and goods for final demand are defined as Final Demand Goods. The latter is divided into "Investment Goods" for capital formation and "Consumer Goods" for consumption by households. Furthermore, "Investment Goods" are divided into "Capital Goods" for equipment investment and "Construction Goods" for construction activities. "Consumer Goods" are divided into "Durable Consumer Goods" and "Non-durable Consumer Goods." "Producer Goods" are also divided into two groups: "Producer Goods for Mining and Manufacturing," which are re-input into production activities in mining and manufacturing, and "Producer Goods for Other Uses," which are input into industries other than mining and manufacturing in the process of production, including goods for enterprise consumption. (Table 2)

Goods for the overseas market are not distinguished from goods for the domestic market in this classification. They are classified according to their original uses.

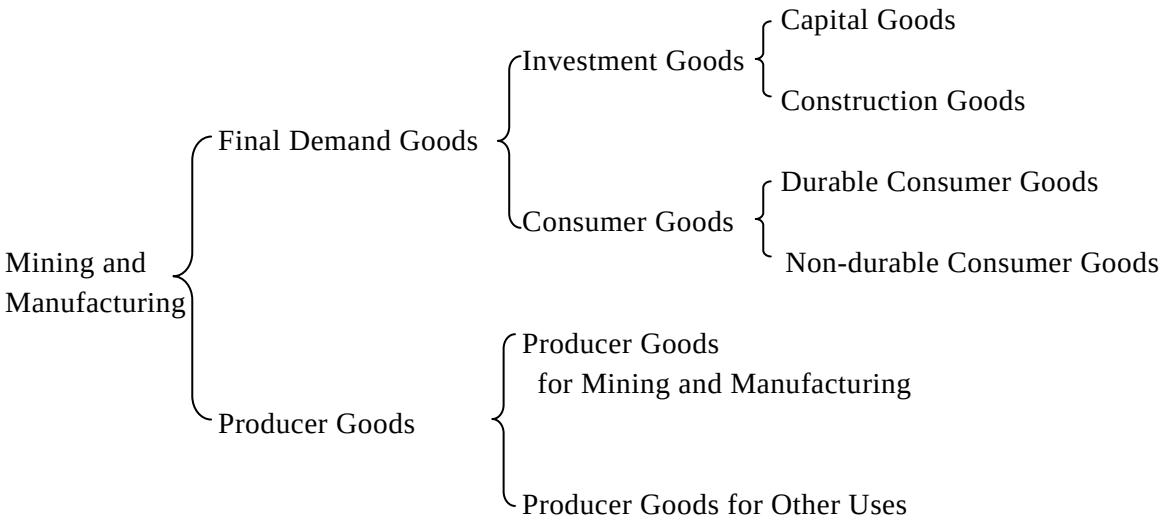

Table 2: Definitions of Goods

Goods	Definitions
Final Demand Goods	Goods which are not input as materials, into mining and manufacturing and other industries, including construction materials, But excluding enterprise consumption goods.
Investment Goods	Capital goods and construction goods
Capital Goods	Products which are purchased by the sectors except for households, provided that, in principle, they have one or more years of an assumed durable term and are purchased at a relatively high price.
For manufacturing equipment	Machinery, equipment and attachments for the production of mining and manufacturing products
For electricity	Machinery, equipment and attachments for power generation

For communication and broadcasting	Machinery, equipment and attachments for communication and broadcasting
For agriculture	Machinery and attachments for agricultural production
For construction	Machinery and attachments for civil engineering and construction works
For transport	Transportation equipment and attachments
For offices	Office equipment and fixtures
Other Capital Goods	Capital goods which are not classified elsewhere
Construction Goods	Goods for construction and civil engineering
For construction	Building materials and fixtures
For engineering	Materials for civil engineering projects
Consumer Goods	Products for households（durable and non-durable consumer goods）
Durable consumer goods	Consumer Goods purchased by household, which, in principle, have one or more years of assumed durability and are purchased at a relatively high unit price.
For house work	Household goods
For heating and cooling equipment	Air-conditioning equipment
For furniture and furnishings	Household furniture and interior furnishings
For education and amusement	Goods for education and amusement
Passenger cars and motorcycles	Passenger cars and motorcycles, including accessories for motor vehicles
Non-durable consumer goods	Consumer goods which, in principle, are assumed to have a durable term less than a year or are purchased at comparatively low unit price
For house work	Miscellaneous and non-durable household goods
For education and amusement	Non-durable goods for education and amusement
Clothing and footwear	Clothes, underwear, shoes, etc.
Food and beverage	Staple food, other foods, seasonings, beverages, confectioneries, etc.
Producer Goods	Products which are re-input into mining, manufacturing and other industries as materials, including enterprise consumption goods, but excluding construction goods
Producer Goods for Mining and Manufacturing	Products which are re-input into mining and manufacturing in the process of production as raw materials, fuels, parts, containers, expendables, tools, etc.
Producer Goods for Others	Raw materials, fuels, containers, expendables and enterprise consumption goods for industries other than mining and manufacturing.

3. Selected Items

(1) Indices of Production, Shipments, Inventory, and Inventory Ratio

Goods are sampled on a representative basis by industry and by type of goods. The number of sample products used to calculate production and shipments indices is 496 (498 industry total). 42 kinds of goods, which have more than dual usage, are treated as belonging to respective categories by dividing the weight at the base period. Therefore, the numbers of sample products used under the classification by type of industry and those of the classification by use of goods differ.

The number of sample products used to calculate inventory indices is 358. The reason why the number is fewer than the number for production and shipments indices is because the inventory of some goods is not counted. Specifically, there is no need to count inventories of commissioned goods, and inventory of some goods cannot be counted due to process complexity.

The number of selected products used to calculate inventory ratio indices is 342. In compiling the Indices of Producer's Inventory Ratio, attention is paid to the items that show large seasonal fluctuations in shipment quantity or very high rate of self consumption by producers. For those kinds of items, "shipment quantity" is unsuitable as the dominator in the above-mentioned formula, so it is replaced by "production quantity," or those items are excluded from the indices.

Sample products under the jurisdiction of the Ministry of Economy, Trade and Industry (449 items out of the 496 items used to calculate production and shipments indices) are selected monthly from the items surveyed in the Current Survey of Production. Those under the jurisdiction of other ministries are as follows.

- Rolling stocks and steel ships (2 items) Ministry of Land, Infrastructure and Transport
- Medical Supplies (1 item) Ministry of Health, Labour and Welfare
- Lumber and plywood (3 items) Ministry of Agriculture, Forestry and Fisheries
- Food (excluding liquor) (35 items) Ministry of Agriculture, Forestry and Fisheries, and the corporations concerned
- Liquor (6 items) Liquor associations

In case of substantial products which require more than several months to complete, the amount of work in progress in a month is regarded as the quantity of production for each month. Those long-term products are listed below.

- Steel bridges (Over 2,000 t)
- Water tube boilers (Over 800 t/h)
- General steam turbines (Over 250,000 kW)
- Power transformers (Over 500,000 kVA)
- Steel ships

Although the measurement unit of each index is quantity in principle, only when the adoption items consist of items from which the quality, size, etc. of a product differ remarkably, the amount of money is adopted as a measurement unit. In the production index, the amount of money is used as measurement unit of 52 items. These items are deflated by the Corporate Goods Price Index, except for one item for which CGPI or any other deflators are not appropriate. A nominal amount of money is used for the item.

(2) Indices of Operating Ratio and Production Capacity

163 items are selected for those indices from items surveyed in the Current Survey of Production on production capacity or equipment.

(3) Indices of Production Forecast

195 items are selected for the forecast from the results of “Survey of Production Forecast.”

4. Formula

Laspeyres Formula is adopted. In this formula, indices are calculated by a fixed weighted average on the basis of figures in the base year.

Meaning of symbols in the formula:

Q,R : Integrated index	o : Base time
q : Quantity	t : Compared time
w : Weight	i : Selected item（i=1,2,...n）
r : Ratio	

（1）Indices of Production, Shipment, Inventory and Production Capacity and Indices of Production Forecast

$$Q_t = \frac{\sum_{i=1}^{n} \frac{q_{ti}}{q_{oi}} w_{oi}}{\sum_{i=1}^{n} w_{oi}} \times 100.0$$

（2）Indices of Producer's Inventory Ratio of Finished Goods and Operating Ratio

$$R_t = \frac{\sum_{i=1}^{n} \frac{r_{ti}}{r_{oi}} w_{oi}}{\sum_{i=1}^{n} w_{oi}} \times 100.0$$

Ratios of those indices are shown below.

Producer's Inventory Ratio of Finished Goods = Inventory quantity/Shipments quantity

Operating Ratio = Quantity of production in the production capacity/Quantity of production capacity

5. Weights

The results of the “Census of Manufacturers（2005）” and other basic data including the “Mining Yearbook of Japan,” and the “Current Survey of Production” are used for the calculation of weights.

（1） Indices of Production, Shipments, Inventory, and Inventory Ratio

Value added weights are calculated on the basis of the value added by industry which is obtained by the survey of the Census of Manufacturers（by Industry）. The formula which calculates added value is as follows.

① Value of products produced = Value of shipments + Change of the product inventory + Change of the semi-manufactured goods and unfinished products

② Value added = Value of products produced - Cost of raw materials, fuels and electricity consumed, and subcontracting orders - Internal excise tax - Depreciation.

However, since the amount of shipment is totaled per establishment in the Census of Manufacturers（by Industry）, when a certain establishment produces the items of varieties ranging over two or more industry classifications, the amount of the shipment of the whole establishment is appropriated for the industry by which the establishment is classified. Adjustment in an item unit is necessary using the results of the Census of Manufacturers（by Commodities）.

Production weights, shipments weights and inventory weights are calculated on the basis of production value, shipment value and inventory value respectively, surveyed by the Census of Manufacturers. Thus, the weight for every adoption item is calculated by prorating the industrial classification weight and the amount of money（added value etc.）of the adoption items.

（2） Indices of Operating Ratio and Production Capacity and Indices of Production Forecast

The base value of weights for those indices are based on the value for the Indices of Industrial Production（value added weights）.

6. Seasonal Adjustments

As for the seasonal adjustment of Indices of Industrial Production, not only seasonal but also “trading-day, holiday and leap year effects” are taken into account, adopting the U.S. Census Bureau's X-12-ARIMA method. Note that only the seasonal effect is considered regarding Indices of Producer's Inventory of Finished Goods and Inventory Ratio of Finished Goods.

7. Connected Indices

（1）Those indices mean 2005 based indices into which pre-2005 basis indices are transformed by multiplying the pre-2005 indices by linking coefficients.

（2）The method of calculation of 2005 based linking coefficients are indicated below.
The seasonal adjustment index are used in those formulas.

$$\text{2005 based linking coefficients (L)} = \frac{\text{2005 based averaged indices for January-March 2003}}{\text{2000 based averaged indices for January-March, 2003}}$$

$$\text{2000 based connected indices} = \text{L} \times (\text{2000 based indices (1998-2003)}, \text{2000 based connected indices (1978-1997)})$$

（3）The old and new indices are connected in two categories: grouping by industry and grouping by use of goods in both non-adjusted and seasonally adjusted indices.

（4）The classification of industries for 2005-based indices are slightly different from the old indices, and the connection is not perfect. When certain old indices do not have a relevant industry in the new indices, connection is impracticable. As a result, some industries, especially industries of minor grouping, in the new indices lack connected indices.

（5）Method of Seasonal Adjustment
Each of the old indices employs the following methods of seasonal adjustment.
- Base indices for 2005 and 1995 Census Method X-12-ARIMA
- Base indices for 1990 and 1985 MITI Method IIIR
- Base indices for 1980 MITI Method III

（6）Publication
The connected indices have been published in the book "Long Term Data Book of Indices of Industrial Production" after the change of the base year.

8. Indices of Production Forecast

The Survey of Production Forecast in manufacturing is to forecast production activities in the coming two months as of the 10th of the month. In this survey, the following production data are collected from major enterprises; the actual production amount for the previous month, the estimated amount for the current month, and the planned amount for the following month. Based on the data collected, the Production Forecast Indices are calculated on 195 manufacturing goods. Two ratios, namely the Realization Ratio and the Amendment Ratio, are also calculated by using these indices.

The Realization Ratio shows to what extent the estimated amount for the current month in the previous survey has been actualized. The Amendment Ratio shows to what extent the current month's estimated amount has been revised compared to the amount planned in the previous month.

Realization Ratio

= the actual production amount of the previous month in the current survey, divided by the estimated amount of the current month in the previous survey

Amendment Ratio

= the estimated amount of the current month in the current survey, divided by the planned amount of the following month in the previous survey

・Indices of Industrial Production are also available on the website of the Ministry of Economy, Trade and Industry.

URL http://www.meti.go.jp/english/statistics/index.html