

Methodology for construction of State IIP with new base year 2011-12

A Working Group was constituted under Dr. Saumitra Chaudhuri, former Member, Planning Commission, for evolving the methodology for compilation of all-India Index of Industrial Production (IIP) with the new base year 2011-12. The report of the Working Group (WG) was submitted to the Government of India in April 2014.

The specifications with regard to the drawing of the item basket and weighting diagram as recommended by the WG have been elucidated below as guidelines for framing the IIP for States/ UTs with base year 2011-12.

Base year and frequency

Since the base year for all-India IIP in the new series has been revised to 2011-12, it is advisable for the States/ UTs to adopt the same base in order to maintain comparability with the all-India figures as well as inter-state comparability.

The frequency of releasing the IIP should preferably be monthly. If bringing out a monthly IIP is not feasible in the initial stages, a quarterly IIP should be published with extra efforts being made to sensitize the factories and increase response rates and their frequency in order to shift to a monthly IIP as soon as possible.

How to measure industrial production

The physical quantum of production and values of output are the preferred units for measurement of industrial production for the purpose of compilation of IIP. (Value of output is used to report production figures of non-additive products such as apparels, commercial vehicles, etc., where a difference in specification of the product entails non-usage of a particular unit of measurement for the purpose of reporting). The quantum of production, as reported, may be used for compiling the indices since IIP is primarily a production index. However, where the figures are supplied in terms of the value of output, such figures may suitably be deflated by using the Wholesale Price Index (WPI) as the deflator for compiling the indices.

Thus, the hybrid method of using a mix of physical quantities and value of output (deflated by WPI) should be followed.

Also in case of 'capital goods' category such as heavy machinery, etc., the production time of one complete unit often exceeds one month's time, hence the monthly reporting of production of such items in terms of physical quantity is neither possible nor it is recorded by the manufacturers. It is, therefore, suggested to consider the value of 'Operating Work in Progress' in order to avoid spikes in reporting of these items and reduce volatility. Operating Work in progress/value of production of capital goods is defined as "Value of Net Sales of Finished Goods" + ["Closing stock of work-in-progress" – "Opening stock of work-in-progress"] + ["Closing stock of unsold Finished Goods" – "Opening Stock of unsold Finished Goods"]. The factories reporting data for such items, should be suitably sensitized beforehand.

Item basket

The scope of IIP constitutes the mining, manufacturing and electricity sectors. Out of the three sectors, mining and electricity are in the form of a composite index.

In case of the index for the *Mining sector*, the item basket as well as the weights are decided and provided by the Indian Bureau of Mines (IBM) to the States/ UTs. IBM supplies a composite index in regard to the items prevalent in the mining sector on the basis of data provided by the mines in the respective states.

For the *Electricity sector*, the electricity generation figures (single item) may be obtained by the Central Electricity Authority (CEA).

In case of the *Manufacturing sector*, the basis for selection of item basket is the GVO figures for products from the Annual Survey of Industries (ASI) 2011-12.

It has been noticed that in the production data of ASI, many products correspond with more than one industry groups (NIC 3-digit level) with varying unit values. This seems to be happened due to the practice of classifying NIC of the factory by the major product manufactured in the factory. It is established that the NIC group in which the product's maximum value occurs is the most correct industrial grouping of the product. Thus for selection of the item basket, a product which gets aligned to more than one NIC groups, has been taken in that particular NIC (3-digit) group in which it has maximum value of output. Thus the methodology proposed for the construction of state-level IIP is as below:

- i. Using the ASI 2011-12 production data pertaining to NIC 10 to 32 the first job is to remove 'other products and by-products' from all the industry groups after re-distributing their values over the rest of the products occurring in the respective industry groups (NIC 3 digits).
- ii. Subsequently, each product (7-digit NPCMS) is placed in alignment with a particular industry group (NIC 3-digit level) in which the product's maximum GVO occurred, leaving with a unique product description, its NPCMS code, its maximum value occurring over the complete dataset and the industry group pertaining to the maximum value.
- iii. From the list stated above, the product descriptions at the 7-digit level of the NPCMS corresponding to not-elsewhere-classified (n.e.c.) products are removed and the contributions of all such products in a particular industry group are re-distributed among the non-'n.e.c.' products. This is done to avoid ambiguity of description as well as to facilitate easy identification and collection of data pertaining to these items from the factories.
- iv. The list of products thus obtained is arranged in descending order of value of output within each 3-digit level of NIC and then starting from the highest contributor, all the products are to be selected till total value of output of the selected products becomes at least 80% of the total value of output at each 3-digit level.

Weighting Diagram

The methodology for deriving the weighting diagram for State IIP is detailed as under:

- i. Sectoral weight: Weight for Mining and Electricity sectors are derived using their respective GVA figures for each of the sectors from the GSDP statistics for 2011-12 released by the Central Statistics Office (CSO) for 2011-12. The weight for manufacturing sector will be based on the total GVA of NICs 10 to 32 at 2-digit level based on ASI 11-12 data.
- ii. Weights at 2-digit level: The weight for the manufacturing sector is distributed at 2- digit levels of NIC in proportion to the total GVA in each 2-digit level of NIC for the State from ASI 2011-12 data. The negative GVA, if any, requires necessary adjustment. The proposed adjustment procedure is explained below in paragraph v.
- iii. Weights at 3-digit level: Weights in each of the NIC 2 digit level is then distributed to NIC 3 digit levels in proportion to their respective GVA figures for the State from ASI 2011-12.
- iv. Weights at product/item group level: NIC-3 digit level weights are then distributed to selected products/ item groups in proportion to their GVOs for the State from ASI 2011-12.

- v. Problem of Negative GVA: The weights at any level of NIC ultimately depend on respective GVA and negative weight is not permissible. Thus, if any negative GVA at any digit level is observed, that may be adjusted/replaced with the following formula:

$${}^s\text{GVA_adj}_z = {}^s\text{GVA}_{\text{all-activities}} \times \left[\frac{{}^s\text{GVO}_z}{{}^s\text{GVO}_{\text{all-activities}}} \right] \dots\dots(1),$$

where ${}^s\text{GVA_adj}_z$ stands for adjusted Gross Value added of s^{th} state from z^{th} activity,

${}^s\text{GVO}_z$ stands for Gross Value of Output of s^{th} state from z^{th} activity,

${}^s\text{GVA}_{\text{all-activities}}$ stands for Gross Value added of s^{th} state from all activities and

${}^s\text{GVO}_{\text{all-activities}}$ stands for Gross Value of Output of s^{th} state from all activities.

Selection of factories

Once the item basket for a State/ UT has been derived, the list of factories under an item may be selected by considering complete list of factories having a substantial combined/aggregate share (at least 25%¹) of production of the item in the state/ UT from ASI 11-12 data. All endeavour should be made to provide a reserve list of factories at item level.

Compilation

Laspeyres' index formula is to be used to compile indices for industrial production in the new series.

¹ While selecting the factories we have considered 50% share.