Salient Features of the new Foreign Trade Indices

1. **Methodology:** Lapeyres Price Index formula with a Fixed Base system is being used to compute the Unit Value Indices. The Quantity Indices are computed as the ratio of the Value Indices to the Unit Value Indices.

2. **Selection of Base Year:** The Financial Year 2012-13 has been selected as a statistically appropriate Base Year.

3. **Commodity Basket :** All the items at 8-digit level in the ITCHS Classification has been included in the Commodity Basket.

4. **Format of Presentation of Indices :** The Indices are presented primarily according to the 169 Principal Commodity (PC) Classification. Apart from that the present format of presentation, i.e., presentation of Indices in SITC and BEC would also be continued. For the SITC Classification, the new Indices are compiled according to the 1, 2 and 3-digit SITC codes. And for BEC Classification, the Indices are compiled according to the 1 and 2-digit codes.

5. **Bilateral and Region-wise Trade Indices :** The Bilateral Indices are compiled for the Top 20 Export and Import partner nations of India. In case of regions, the Region-wise Indices are compiled for 20 regions and groupings which are available in all standard foreign trade publications of DGCIS.

6. **Time period for compilation of Indices :** The Indices will be published on a monthly, quarterly and yearly basis.

7. **New series of Index numbers :** The new series of Index numbers have been compiled from April, 2013 onwards.

Unit Value Index Formulae

The Unit Value Index (export or import) for j^{th} (PC / SITC / BEC) group, for m^{th} month, t^{th} year is given by

$$I_{jmt} = \frac{\sum_{i=1}^{n_{jmt}} (\frac{P_{ijmt}}{P_{ijmb}}) w_{ijmb}}{\sum_{i=1}^{n_{jmt}} w_{ijmb}}$$

where,

$w_{ijmb} = \frac{v_{ijmb}}{\sum_{i=1}^{n_{jmb}} v_{ijmb}}$

P_{ijmt} = Unit Value of an item i in group j, month m and year t

P_{ijmb} = Unit Value of an item i in group j, month m in base year b

v_{ijmb} = Total (export / import) Value of an item i in group j, month m in base year b

n_{jmt} = Total number of items in group j, month m and year t

n_{jmb} = Total number of items in group j, month m and base year b

The Unit Value Index for the m^{th} month, t^{th} year is given by

$$I_{mt} = \frac{\sum_{j=1}^{k} I_{jmt} w_{jmb}}{\sum_{j=1}^{k} w_{jmb}}$$

where,

$w_{jmb} = \frac{\sum_{i=1}^{n_{jmb}} v_{ijmb}}{\sum_{j=1}^{k} \sum_{i=1}^{n_{jmb}} v_{ijmb}}$

The Unit Value Index for the t^{th} year is given by

$$I_{t} = \frac{\sum_{m=1}^{12} I_{mt} w_{m}}{\sum_{m=1}^{12} w_{m}}$$

where,

$w_{m} = \frac{\sum_{j=1}^{k} \sum_{i=1}^{n_{jmb}} v_{ijmb}}{\sum_{m=1}^{12} \sum_{j=1}^{k} \sum_{i=1}^{n_{jmb}} v_{ijmb}}$

Quantity Index Formulae

The Quantity Index (export or import) for j^{th} (PC / SITC / BEC) group, for m^{th} month, t^{th} year is given by

$$q_{jmt} = \frac{v_{jmt}}{I_{jmt}}$$

where

$v_{jmt} = \frac{\sum_{i=1}^{n_{jmt}} v_{ijmt}}{\sum_{i=1}^{n_{jmb}} v_{ijmb}}$

v_{ijmt} = Total (export / import) Value of an item i in group j, month m in year t

The Quantity Index (export or import) for m^{th} month, t^{th} year is given by

$$q_{mt} = \frac{\sum_{j=1}^{k} q_{jmt} w_{jmb}}{\sum_{j=1}^{k} w_{jmb}}$$

The Quantity Index (export or import) for t^{th} year is given by

$$q_t = \frac{\sum_{m=1}^{12} q_{mt} w_m}{\sum_{m=1}^{12} w_m}$$

Meaning and interpretation of the Indices

The Unit Value Indices and the Quantity Indices may be interpreted along the following lines.

The Unit Value Index answers the question : *What is the growth in the average Unit Value of the items* [1] *traded in the current month with respect to the same month in the Base Year?*

So, an **Unit Value Index** of, say, 120 means that if the items that have been traded in the current month had been traded in the same month of the base year, and if the average price (or unit value) of those items had been Rs.100 in that month of the base year, then the average price (or unit value) of these items in the current month is Rs.120. Or that, there is a 20% increase in the *average* Unit Value, with respect to the Base Year, of the items that have been traded in the Current Month.

> For example, let us suppose 30 items, 10 items each from 3 different Principal Commodities, have been traded in the current month. If these 30 items had been traded in the corresponding month of the base year at an average price of Rs.100, then the average price of these items in the current year is Rs.120.
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> It is to be noted that there are two successive steps of averaging done here. The first averaging is done over all the items (or ITCHS) of a PC group to arrive at the Index of that PC group. And the second averaging is done over all the PC groups to arrive at the Index at the Grand Total level for all commodities (which is the overall Index for India for a month) . In both the stages, a weighted average is taken where the weights are proportional to the importance of the items and the PC groups respectively, and the Laspeyres Formula is used for averaging.

A **Quantity Index** of, say, 200 means that if in the base year on an average 100 units were traded in India in the base year, then in the current year on an average 200 units were traded. However, it must be remembered that averaging quantities are different from averaging prices, since quantities in different units cannot be added directly.

[1] An *item* here refers to an ITCHS code. So, if two items are traded in a month, it means that commodities under two different ITCHS codes have been traded in that month.

So, the Quantity Indices are calculated by dividing the Value Indices by the Unit Value Indices. For example, if there is an increase in the Value of Export from Rs. 10,000 to Rs. 24,000, then the Value Index is $24000/10000 \times 100 = 240$. If the Unit Value Index is 120, then the Quantity Index comes to $240/120 \times 100 = 200$. So, loosely it can be said that, if the value of export has increased 2.4 times and the price of the commodities has increased 1.2 times, then the quantity must have doubled.

However, it may be noted that a very high or low Quantity Index may indicate the presence of Base Effect.

The Interpretation of the **Bilateral and Regional Indices** can be seen as an extension of the above.

A Unit Value Index of 120 with respect to a country, say Bangladesh, means that if all the items that have been traded with Bangladesh in the current month had been traded in the same month of the base year with the same country, and if the average price (or unit value) of those items had been Rs.100 in that month of the base year, then the average price (or unit value) of these items in the current month is Rs.120.

Similarly, a Quantity Index of 200 with respect to a country, say Bangladesh, means that if in the base year on an average 100 units were traded in India in the base year, then in the current year on an average 200 units were traded.

Comparability of the Indices across time

It is to be noted that the **weights** in the Index Number formula are fixed across time and there are twelve sets of weights for the twelve months. Hence, comparability of Indices is meaningful only when Indices of same month are compared across years. Different months may attach different weights to the same item, and hence comparing indices of two different months becomes vague and may have little applicability.

Further, the weights of the items that are not present in the trade basket of the current month are distributed to all the items that have been traded in the current month. This distribution is done in proportion to the weights of those items.

For example, let us suppose there are only 3 commodities for trade, say A, B and C. In month May of the Base year, let us suppose that the trade value of A was Rs. 50, B was Rs. 100 and C was Rs. 50. Then the

weights assigned to A, B and C in the month of May of the following years would be in the ratio 25 : 50 : 25. However, in case, C is not traded in the current month, then the weight of C would be distributed proportionately among A and B, again in the ratio 1:2 (since in May the weights of A and B are in the ratio of 50 : 100, i.e., 1 : 2). So, in the current month the weights of A and B would be $33\frac{1}{3} : 66\frac{2}{3}$.

As a result, the weights in any two given months are dependent on exactly the number of items (ITCHS codes) traded in those months. If the items traded are widely different, inference drawn from the comparison of the Indices may be done accordingly. On the other hand, *more the similarity in the number of items traded more is the comparability of the two indices.*

Criticisms

The formula that has been used is Laspeyres Price Index formula. The drawbacks and criticisms of this formula are well documented in the literature of theory of Index Numbers and the same drawbacks continue here as well. The inference drawn from these figures should be done after considering these drawbacks.