

TECHNICAL NOTES

Producer Price Index – Manufacturing (PPI-M)

1. Definition

The Producer Price Index (PPI-M) measures changes in the effective prices received by manufacturers for that part of their output which is sold on the domestic market. The index covers manufacturing establishments which supply their products on the domestic market.

It normally refers to a family of indices which includes:

- (a) Industry output prices indices
- (b) Detailed commodity price indices, and,
- (c) Stage-of-processing prices indices

The concepts and definitions of the PPIs largely follow internationally accepted standards (PPI Manual of the International Monetary Fund).

2. Scope

The PPI-M covers all large manufacturing establishments (that is those employing 10 or more persons) falling within divisions 15 to 37 of the National Standard Industrial Classification of all Economic Activities (NSIC 1990), whose output is mainly sold on the domestic market.

The index therefore excludes enterprises classified under Export Oriented Enterprises (EOE). These comprise enterprises formerly holding an EPZ certificate as well as those manufacturing goods for export and holding a registration certificate issued by the Board of Investment. Moreover the following divisions have been excluded in the compilation for reasons given below:

- (a) Division 16: Manufacture of tobacco products (no longer manufactured in Mauritius)
- (b) Division 23: Manufacture of coke, refined petroleum products and nuclear fuel (not produced in Mauritius)
- (c) Division 30: Manufacture of office, accounting and computing machinery (weight in the overall index is not significant and change of products is too dynamic)
- (d) Division 32: Manufacture of radio, television and communication equipment and apparatus (weight in the overall index is not significant and change of products is too dynamic)
- (e) Division 33: Manufacture of medical, precision and optical instruments, watches and clocks (weight in the overall index is not significant and change of products is too dynamic)

Considering the above adjustments, the activities covered by the index represent around 97% of the gross output generated by enterprises in the Non-EOE manufacturing in 2007.

3. Reference Year

In contrast to previous ones when the base year was 2003 (2003 = 100), as from this issue of the ESI, PPI-M is using weights updated as at 2007 (2007 = 100).

4. Frame

A list of some 450 establishments, engaging 10 persons or more, falling within the scope of the PPI-M was obtained from the 2007 CEA and classified at 5-digit NSIC. Data on Gross output for each establishment was also available.

5. Selection of establishments (producers)

A sample of 113 establishments was drawn from the list. These establishments are the most important ones in terms of Gross Output (GO) in their respective 5-digit NSIC activity group. Establishments selected in each activity group contribute together at least 60% of GO in that group.

Using the scheme above the overall sample contributes around 65% of the GO of the sector.

6. Selection of products to be priced

From each selected establishment the product(s) selected for pricing are those which are the most important ones in terms of contribution to the turnover of the establishment.

7. Prices collection

Prices collected refer to the prices received by producers for the sale of their products on the local market. The prices exclude all taxes on products, namely excise duty and value added tax.

Prices of products are collected from the sample of products mentioned in Para. 6. Producers are contacted on field on a quarterly basis and prices of the selected products are collected for each month of the reference quarter. For example, if reference quarter is 3rd Quarter, producers are contacted during the month of October and November and prices are collected for the months of July, August and September.

Altogether some 315 prices are collected every quarter.

8. Updating of weights

8.1 *Historical background*

The Central Statistics Office first published a Producers Price Index limited to the “Manufacturing of food products, beverages and tobacco” in March 1994 with 1993 as reference period (1993 = 100). The coverage of the index was extended in June 2002 to cover all relevant industry groups of the former Non-EPZ manufacturing sector. At the same time, in order to reflect changes in the production pattern, the basket of goods used to compile the index was updated based on data available from the 1997 Census of Economic

Activities conducted by this office. The base year was subsequently revised to 1998 (1998 = 100). The revision was once again repeated in 2006 when the base period was revised to 2003 (2003 = 100) and up to the previous issue of the ESI in June 2010 the PPI-M was compiled and disseminated with 2003 as base period.

Results from the 2007 Census of Economic Activities being now available it has been possible for this office to update the basket of goods and compile the PPI-M with year 2007 as base period.

8.2 Evolution of weights from 2003 to 2007

The weight ' W_i ' associated with for a particular product 'i' at 5-digit NSIC level is based on the relative proportion of the Gross Output (GO) of the establishments manufacturing that product to the total GO of all establishments comprising the activity group. Weights at higher level of aggregation was compiled using the same methodology

The updated weights were based on data available at the 2007 Census of Economic Activities. From this census, data on Gross Output as well as types of products manufactured were collected from establishments falling within the scope of the PPI-M. It is to be noted that Gross output is valued at basic prices, and thus excludes all taxes on products, namely excise duties and value added tax.

The main observations on the evolution of the weights from 2003 to 2007 are as follows:

- (a) Some activities have gained relatively more importance in terms of their weights in the basket of goods over the years. The main ones are:
 - (i) Manufacture of food products and beverages (from 45.9% to 51.4%)
 - (ii) Manufacture of other non-metallic products (e.g stone crushing) (from 9.6% to 11.7%)
 - (iii) Manufacture of rubber and plastic products (from 2.6% to 5.1%)
 - (iv) Manufacture of machinery and equipment n.e.c (from negligible (0%) to 0.9 %)

- (b) The weights of some of the activity groups have decreased. The main ones are:
 - (i) "Manufacture of Tobacco" (from 2.5% to 0) due to the fact that it is no longer produced in the country
 - (ii) "Manufacture of Textile" and "Manufacture of wearing apparel" (total weights from 4.6% to 2.6%), explained mostly by a shift of establishments in these Division from Non-EOE to EOE.
 - (iii) "Manufacture of chemicals & chemical products" (from 10.4 % to 9.5%), mostly explained by a change in activity from manufacturing to blending.

Distribution of weights by Divisions (2-digit level of NSIC)

NSIC Divisions	Description	Weight 2003	Weight 2007
15	Manufacture of Food Products and Beverages	459	514
16	Manufacture of tobacco products	25	0
17	Manufacture of textiles	20	6
18	Manufacture of wearing Apparel	26	16
19	Tanning, dressing of leather, manufacture of luggage, handbags etc.	5	2
20	Manufacture of wood, wood products and cork except furniture	10	14
21	Manufacture of paper and paper products	23	9
22	Publishing, printing and reproduction of recorded media	67	59
23	Manufacture of coke, refined petroleum products	0	0
24	Manufacture of chemicals and chemical products	104	95
25	Manufacture of rubber and plastic products	26	51
26	Manufacture of other non-metallic mineral products	96	117
27	Manufacture of basic metals	39	24
28	Manufacture of fabricated metal products	54	33
29	Manufacture of machinery and equipment, n.e.c.	0	9
30	Manufacture of office, Accounting and Computing Machinery	0	0
31	Manufacture of electrical machinery and apparatus, n.e.c.	5	12
32	Manufacture of radio, television and communication equipment and apparatus	7	0
33	Manufacture of radio, television and communication equipment and apparatus	0	0
34	Manufacture of motor vehicles, trailers and semi-trailers	4	3
35	Manufacture of other transport equipment	0	3
36	Manufacture of furniture, and manufacturing n.e.c.	30	33
	OVERALL INDEX	1000	1000

9. Index Calculation

As from this issue of the ESI, the methodology for compiling the PPI-M has been improved to meet international recommendations as set out in the 'Producer Price Index Manual' published by the International Monetary Fund.

In contrast to previous issues of the ESI, the PPI is calculated according to a modified geometric Laspeyre's formula known Jevons Price Index. Similarly to the method used previously, it uses constant weights as at the base period (Year 2007) and current prices. However the formula for compiling the index has been changed from a weighted arithmetic average of price relatives to a weighted geometric one.

The formulae used in given below

$$I_c = \prod (P_{ci} / P_{oi})^{W_{io}} * 100$$

where I_c = Index for current period (usually month)
 P_{ci} = Price of product i for the current period
 P_{oi} = Price for product i for the base period (2007)
 W_{io} = Weight associated with product i at the base period

Note that the W_{io} is a proportion and $\sum W_{io} = 1$. E.g If I_c is the Index for the whole manufacturing sector, then W_{oi} for 'Manufacture of food and beverages' (1st Division) for the manufacturing sector = 0.514 (See Table above).

The PPI-M is calculated at the 5-digits level of NSIC by the above formulae. Indices at the Division level (2 digits NSIC) are then derived as a weighted geometric average of the indices of the products falling within each division. Finally, the overall index is obtained as a weighted geometric average of the Division indices.

Indices at a different level of aggregation (3-digit, 4-digit...) are also compiled using the same methodology.

10. Uses

- (a) The PPI is a leading indicator of the future status of inflation. Movement of PPI is usually indicative of a similar change of part of the CPI. PPI can also be used in the economic analysis of inflation transmission process.
- (b) It provides specific price deflators for the computation of national accounts at constant prices in order to measure real growth
- (c) It is helpful in the formulation of contract agreement. It can be used as an escalation clause to protect buyers and sellers against inflation or deflation.
- (d) PPI is also used in econometric models, in forecasting and in inventory accounting.

11. Missing Prices

In the case of temporarily missing prices for products, the change in the prices will be assumed to be following the same trend as the average price in the 5-digit NSIC group or that at higher level.

12. Treatment of Product Permanently Disappeared

Products may disappear permanently for various reasons. The product may disappear from the market because new products have been introduced or the establishments from which the price has been collected have stopped selling the product. When a product disappears permanently, a replacement product of a similar nature will be included in the index.

13. Treatment of Quality Change

Existing varieties often decrease in importance or disappear from the market altogether as new varieties appear. The method used to deal with such a situation is the same as that described at paragraph 11 above.

14. Reliability of the PPI-M

The statistical accuracy of PPI depends heavily on the quality of information provided by respondents. This office places great emphasis on the need for reporting effective selling prices, i.e. the amount realized by a producer when selling its products on the market inclusive of all discounts and other price deductions rather than the list or catalogue prices.

On the field a system of sample checks is already in place for detecting systematic errors in the collection process. The results are analyzed right on field by analyzing the monthly changes and comparing also the prices those collected at the same month of previous year. Outliers are discussed with the producers to ensure that they are genuine.

At office level, comparisons are made with the CPI and with the import/export price indices. Systematic analyzes of the source data are made in the context of weight and base year revisions that occur every five years.

15. Caution

With the changes brought to the methodology and weights of the index figures published in this issue of the ESI on PPI-M and those published earlier are **not strictly comparable**. For ease of analysis, the series of PPI-M for the manufacturing sector and those for “Manufacture of food and beverages” have been revised backward down to 1998 and given in Table 6.