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Producer Price Index

Sixth Issue
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His Majesty Sultan Qaboos Bin Said

Forward

The Producer Price Index (PPI) is one of the important indicators businesses and policymakers use in monitoring and evaluating the economic health of the industrial sector, similar as the Consumer Price Index (CPI), the PPI measures the average changes in prices received by producers for their products that are exported or sold on the domestic market. Currently, the index covers mining and quarrying sector, electricity and water sector in addition to the manufacturing sector. In view of the importance of this index, we present in this publication the methodology used in its compilation and detailed data on the indices.

On this occasions, we would like to extend our sincere thanks to all establishments that facilitating the survey process. We hope that you will benefit from the information contained in this publication, and we welcome any proposals or comments for upgrading and improving it.

We pray to almighty Allah to grant success to our efforts to promote Oman to the highest ranks under the wise leadership of His Majesty Sultan Qaboos Bin Said, Sultan of Oman.

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Section One

An Overview of the Producer Price Index

1- The Producer Price Index (PPI) Concept

An index is a statistical indicator that measures the relative change on the values of a certain phenomenon (price - quantity - value - wage ... etc.) through time.

The producer price indices (PPIs) are a set of statistical indicators that measure the average changes that occurs on the prices of goods produced and sold by producers. It is based on a basket of goods - a wide collection of specific typical or representative products -whose prices are collected quarterly from the manufacturers, which represent the prices of industrial production in the period of time (called the comparison period) relative to another period (base period). This change in prices reflects the burden on the consumer and the circumstances and the cost of living, whether they register an increase or decrease, relative to the base year.

2-Uses of PPI

The uses of the PPI vary from country to country but, in general, the main common uses can be identified:

- Measuring the broader inflation level together with other indices such as (CPI - WPI - IPI).
- whether inflation due to the change in the prices of locally produced goods.
- In economic and social analysis and determination of the policies thereof.
- As deflator for converting aggregates from current prices to constant prices in the national accounts and the balance of payments.
- Comparison of the relative movements of prices.
- Predict the change in CPI in terms of locally produced goods.

3-Compilation of the PPI in the Sultanate

The construction of the PPI started in 2006 using the data of industrial survey for 2005 as referral year to prepare weighted averages for the production activities and goods (relative share) according to International Standard Industrial Classification (ISIC) and Central Product Classification (CPC). The final index uses the year 2007 as the base year for both the prices and production weights. At the first stage, the PPI covers products in all manufacturing sector, mining and quarrying, and electricity and water industries. The PPI is calculated for three closely related aggregates where two series of indices are prepared namely producers price index for domestic use and producer price index for export; the general price index is prepared by using these two series according to CPC.

Due to the importance of the index and continuity in its preparation, an automated new system has been established to enable workers in preparing and updating the index periodically as to the expected developments that are expected to affect this indicator.

Section Two

The Methodology

1-Construction of the PPI

Like any other statistical product, the compilation of the Producer Price Index requires a lot of preparation before the actual calculation of the index. The quality of this statistical indicator, like any other statistical product depends on compatibility of the methodology requirements and the practical issues for its production as follows:

1. Weights (relative Significance).
2. Producer basket.
3. Scope and price survey sources.
4. Price survey and auditing.
5. Base year.

1-1 Weights (Relative Significance)

The data of the 2007 industrial survey were used for calculating the relative share of the various industries outputs produced in the Sultanate whether sold in local markets or exported to other countries. As the industry produces goods for domestic use or export, the weighted averages were prepared for products entering the local market, exported products as well as weights for the total production.

The PPI covers all relevant industries at 4-digit industry level (ISIC). Only some 5% of the total manufacturing output from various small industries is not covered in the price collection. The goods' weights and their items were calculated using data obtained from the sampled industrial establishments.

Table (1): Weights of Oil and Non-Oil Activities in the Sultanate
(Base Year =2007)

Classification	Group	Total	Local	Export
	Oil and gas activities	79.534	33.107	46.427
C11	Extraction of oil and gas	55.997	26.004	29.993
D23	Refined oil and gas products	23.537	7.104	16.434
	Non-oil activities	20.465	12.414	8.051
C	Mining and Quarrying	0.381	0.037	0.344
C[13-14]	Mining of non-ferrous metal ores and quarrying	0.381	0.037	0.344
D	Manufacturing	15.502	7.795	7.707
D15	Food stuffs and beverages	3.048	1.744	1.304
D[17-19]	Textiles , clothes and foot wears	0.056	0.039	0.017
D[20-22]	Wood and paper/printing and publication	0.477	0.415	0.061
D24	Chemical materials and products	3.545	0.465	3.081
D25	Rubber and plastic products	0.751	0.477	0.274
D26	Other non-metallic products	2.012	1.375	0.637
D27	Basic metals	1.912	1.151	0.761
D28	Modeled metal products	0.758	0.721	0.037
D29	Machineries and equipments	0.240	0.219	0.021
D31	Electrical equipments and appliances	2.206	0.817	1.389
D36	Furniture	0.496	0.370	0.126
E	Electricity and water supplies	4.583	4.583	0.000
E40	Electricity supplies	3.546	3.546	0.000
E41	Collection, purification and distribution of water	1.037	1.037	0.000

1-2 Product Basket

Product basket comprises three levels: Level one for the main groups, level two for the sub groups and the last level for items of goods .The goods are classified according to the Central Product Classification (CPC) and the selection was by the relative share inside the company.

1-2-1 First Level (Main Groups)

Consists of :

1. Products of Mining, Electricity & Water.
2. Products of Food, Beverages & Textiles.
3. Products of Transportable Goods.
4. Products of Metal, Machinery & Equipment.

1-2-2 Second Level (Sub-Group)

Includes the sub groups of the main groups. As example : group of food, beverages, textiles, clothes and foot wear is divided into many groups such as: fish, fruits, vegetables and oil group, dairy products group, grain products group ...etc. and the same is for other main groups.

1-2-3 Third Level (Transactions)

Items of goods is the last level in the classification where each item is defined according to the data received from source such as size , unit of measure and other specifications to facilitate the researcher follow up of the item's price accurately .

Example :

- Mango Juice /Khaleej/ 1x24x250 ml (carton)
- Tomato Sauce/Jumbo/ 36x88 ml (carton)

1-3 Scope and Price Survey Sources

The current PPI in the Sultanate covers the following three main production sectors: Mining and quarrying (C), Manufacturing (D), Electricity and water (E) whereas all activities classified in these sectors were included. A sample of establishments was selected from each of the main activities, and these companies' main goods and items were selected to be followed quarterly.

The industrial establishments in the sample are classified according to the International Standard Industrial Classification (ISIC). About 157 sources cover all sectors which were chosen using data of 2007 industrial.

1-4 Price Survey

Collection of price data is considered one of the most and critical phases of an index compilation which requires the presence of a mechanism for organizing this important process to ensure data accuracy and confidentiality guaranteed by the Statistical Law No. 29/2001.

Currently, the prices are collected quarterly from all selected establishments where 564 items of 121 commodity entering local market, and 329 items of 102 export commodity.

1-4-1 Mechanism of Prices Survey and Auditing

The data are collected through an integrated automated program linked to the internet, and sending the survey form through the email to all sampled establishments which enable them to enter their prices and explaining the reasons for low or high price during that quarter. The sources are followed up by phone or through field visit till receiving their data.

The price collection is followed by the auditing process, where the current price is compared with the previous price and approving the correct price, and so on for all other sources.

1-5 Base Year

The price index depends on the referring the values of the current period to a base period for the same product or transaction. Therefore, a base year price will be established. These are average prices of items during the year specified as the base year. However, the selection of the base year requires that such year must be a normal one i.e. there is economic stability. The base year will be updated every five years. The year 2007 was chosen as the base year for PPI in the Sultanate.

2- Calculation of the Index

2-1 Calculation Formula

The price index in the Sultanate is calculated in two phases. First, a geometric average of price changes within the lowest level of the CPC classification (elementary aggregate) is used. After that standard Laspyres arithmetic aggregation formula at all subsequent phases is used. :

Elementary index K:
$$I_K = \prod \left(\frac{P_i^t}{P_i^0} \right)^{w_i}$$

Higher level PPI indices
$$\sum (I_k \times w_k^0)$$

Where :

P_i^t = commodity price at comparison year (current period price)

P_i^0 = base year price

W_i and W_k = item and product weights (relative shares)

2-2 Treatment of Missing Prices

The PPI relies on the prices of the same items of goods. It is necessary, of course, to determine the specification of these goods in order to ensure consistent specifications or quality when surveying prices. The problem that may be encountered sometimes is the lack of price for some goods, due to seasonality or other factors. This problem arises in the food processing where either the growing season or other seasonal patterns determine the time of processing.

Therefore, such cases need to be addressed through a scientific approach called (Group Relative Method). This method involves an estimation process for price on the basis of change in prices of the remaining items for the same source. Alternatively, prices may be estimated on the basis of change in item prices of the same product, in case that all items are not available in the source. In the event of total closure of the source, temporarily, all prices of such source will be estimated based on the change in prices of sources that share the same products collected from these sources.

2-3 Treatment of Disappearance of Items and Sources

When a brand disappears permanently due to that the company have seized producing it, this is addressed according to the methodology used by substituting a new brand from the same company and the same product or the higher level of the disappeared brand. The base year price for the new brand is estimated by using an international statistical method called overlap method.

The method - Link to Show No Change - is used in case a brand disappeared during a month and appearance of substitute brand in the same month, thus the old brand is substituted by the new one. The base price for the new brand is estimated as follows:

$$N_b = \frac{P_b \times P_c}{P_{0-1}}$$

Where :

N_b = Base price of the new good.

P_b = Base price of the old good.

P_c = Price of the new good in current month.

P_{0-1} = Price of the old good in previous month.

Section Three

The Output