PRODUCER PRICE INDEX (MINING AND UTILITIES) QUARTER 4, 2019

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STATISTICS BOTSWANA

PRODUCER PRICE INDEX (MINING AND UTILITIES) – QUARTER 4, 2019

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Table of Contents

1.0 COMMENTARY

1.1 Mining Producer Price Index

Statistics Botswana published the PPI Mining Quarter 2 up to Quarter 3 of 2019 in March 2020. However, dissemination of the Mining Producer Price Index (PPI) was suspended ahead of the Quarter 4, 2019 index due to concerns with the volatility of the diamond index.

Statistics Botswana is following price movement of two types of diamonds, namely the Serie goods and the Special stones. The Special stones have the most volatile prices since they come with different cuts and appearances. This makes comparison difficult because there is a need to compare the price movement of the same commodity with the same attributes. Following technical guidelines from the International Monetary Fund, Statistics Botswana decided to remove the Special Stone and add its weights to the Serie goods, hence backdated the indices to 2017 to cater for the removal . **See Appendix 1.**

The Mining Producer Price Index moved from the revised 84.8 in Quarter 3 of 2019, registering a decrease of 11.3 percent to 75.2, recorded in Quarter 4 of 2019. The decrease was mainly due to a fall in the section index of diamond by 12.0 percent, which accounted for 94.7 percent of the overall basket of mining. The Gold and Coal index also fell by 20.1 and 0.9 percent respectively.Other Minerals indices which include Soda Ash and Salt increased by 2.8 and 13.0 respectively. Only Quarry did not record any change. **Refer to Table 2.**

The Mining Producer Price Annual Inflation for the fourth quarter of 2019 declined to negative 17.7 percent as opposed to negative 4.5 percent recorded in the third quarter of 2019. The fall was mainly due to a drop in Gold, Diamond and Coal indices by 20.1,12.0 and 0.9 percent respectively. **Refer to Table 1.**

Chart 1: Quarter on Quarter Percentage Change for Mining Producer Price Index(PPI)

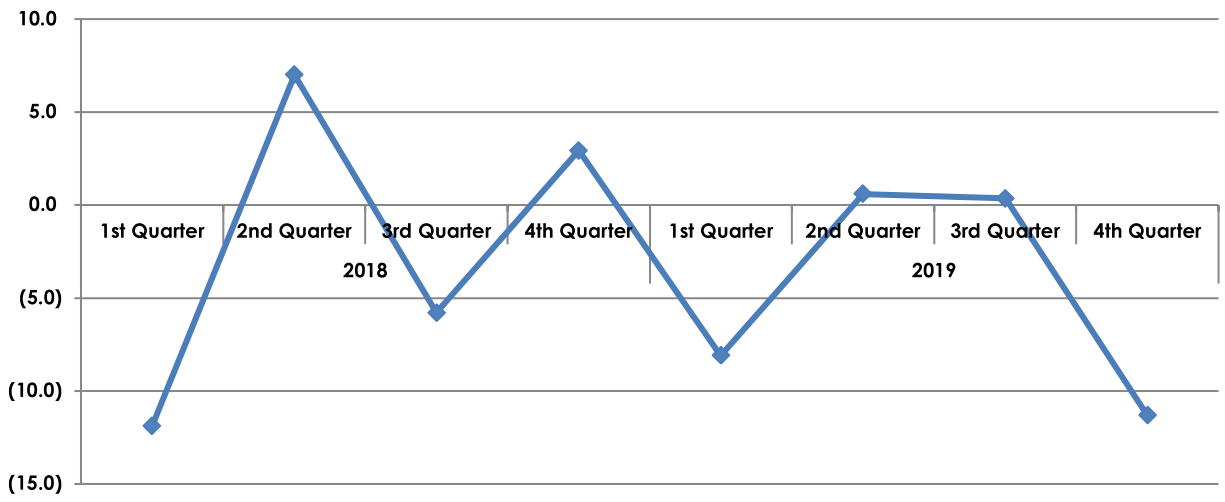

TABLE 1: Percentage change (Mining)

Year	Quarter	PPI Index	Quarter on Quarter change	Year on Year change
2017	Base Period	100.0	-	-
2018	Quarter 1	88.1	(11.9)	-
	Quarter 2	94.3	7.0	-
	Quarter 3	88.8	(5.8)	-
	Quarter 4	91.4	5.4	-
2019	Quarter 1	84.0	(8.1)	(4.7)
	Quarter 2	84.5	0.6	(10.4)
	Quarter 3	84.8	0.4	(4.5)
	Quarter 4	75.2	-11.3	-17.7

TABLE 2 : Mining Producer Price and Group Index (2017=100.0)

Group		Weights	3rd Quarter 2019	4th Quarter 2019	% Change on: Last Quarter
	Mining	100.00	84.8	75.2	-11.3
1.0	**Diamond**	94.67	83.0	73.0	-12.0
2.0	**Coal**	0.93	119.4	118.4	-0.9
3.0	**Gold**	1.05	125.0	99.9	-20.1
4.0	**Soda Ash**	1.94	116.2	119.4	2.8
5.0	**Salt**	0.74	107.0	120.9	13.0
6.0	**Quarry**	0.67	115.6	115.6	0.0

1.2 **Utilities (Water and Electricity) Producer Price Index**

The Utilities Producer Price Index in the fourth Quarter of 2019 remained constant at 111.2, the same index as in the third Quarter of 2019.

The year on year Utilities Producer Price inflation for the fourth quarter of 2019 recorded zero percent, the same rate as in the third quarter of 2019 **(Refer to table 3)**.

TABLE 3: Percentage change Utilities (Water and Electricity)

Year	Quarter	PPI Index	Quarter on Quarter change	Year on Year change
2017	**Base Period**	100.0	-	-
2018	**Quarter 1**	100.0	-	-
	Quarter 2	111.2	11.2	-
	Quarter 3	111.2	0.0	-
	Quarter 4	111.2	0.0	-
2019	**Quarter 1**	111.2	0.0	11.2
	Quarter 2	111.2	(0.0)	(0.0)
	Quarter 3	111.2	0.0	(0.0)
	Quarter 4	111.2	0.0	0.0

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Statistician General
April 2021

Appendix 1: **Technical notes**

1.1 **Determination of PPI- Basket**

A price index is calculated by measuring the change in the price of a 'fixed basket' of goods and services over time. The basket is selected based on the items (goods) which are relevant, reliable, representative of the industry, and comparable over a period of time. Data for weighting the items that form the PPI basket comes primarily from the sales/revenue of each mining company. The weights are key elements in the construction of PPIs in order to determine the impact that a particular price change will have on the overall index. Basing on the weights of products, diamond, coal, gold and salt are representative of the mining sector. Mining Producer Price Index is subject to revision pending further investigations about the data.

Water and Electricity weights were derived from total revenues of the Utilities companies. The weight reference period of the basket is 2017.

1.2 **Weighting**

Weights refer to the relative importance of the items in the basket in terms of their revenue values. Weights are usually expressed as a percentage relative to other items in the basket, with all weights summing to 100.

The weight of an item determines the impact that a particular price change will have on the overall Producer Price Index. An item that carries more weight has a greater impact on the overall producer price index than one with a lesser weight if both are subjected to the same price change. Weights will be reviewed every five years to ensure that they remain representative of the current economic condition.

TABLE 1.2: Mineral Products and their Weights

	Commodity Group	Weights (%)
1.0	Diamond	94.67
2.0	Gold	0.93
3.0	Soda Ash	1.05
4.0	Coal	1.94
5.0	Salt	0.74
6.0	Quarry	0.67

Table 1.2b: Utilities Weights

Commodity Group	Weights (%)
Electricity	67.97
Water	32.03

1.3 **Coverage**

The Producer Price Index is not calculated separately for the regions. Products having a certain share in production are covered without a regional or district separation. The geographical coverage is national.

1.4 **PPI –Products Classification**

The following classifications are used; the Central Product Classification (CPC) to classify products and International Standard Industrial Classification (ISIC) to classify industries.

1.5 Difference between Producer Price Index (PPI) and the Consumer Price Index (CPI)

The Producer Price Index (PPI) measures the change in prices received by businesses for the goods and services they produce, whereas the Consumer Price Index (CPI) measures the change in prices for the goods and services purchased by consumers.

The PPI and the CPI differ in their treatment of imports. The CPI includes within its scope, goods and services purchased by households within Botswana and therefore includes imports. In comparison, the PPI does not include imports, because imports are by definition not produced by domestic producers. For example, imports compose a significant portion of the CPI, especially new-cars, a substantial portion of clothing and food items.

It should also be noted that the PPI and the CPI differ in their categorisation and treatment of trade and transportation. For instance, the PPI normally separates the costs of transporting, retailing, and wholesaling from the cost of the good itself and classifies trade and transportation as services. In comparison the prices for goods as measured by the CPI usually include the value of the goods, the value of transporting the goods, and the trade margins associated with the sale of the goods.

Another distinction is that prices measured by the CPI include sales and excise taxes, while prices measured by the PPI exclude those taxes. All prices collected for goods covered in the PPI are the revenue received by the producers. Sales and excise taxes are excluded from the price because they do not represent the revenue of the producer. The prices collected for goods contained in the CPI are the out-of-pocket expenditure by consumers for those items. Again in the CPI, sales and excise taxes are included in the price because they are necessary expenditures by consumers for the items.

The main use of the PPI is to deflate revenue streams in order to measure real growth in output, while the primary use of the CPI is to adjust income and expenditure streams for changes in the cost of living.

1.6 Methodology

Botswana PPI is calculated using a modified Laspeyres index. The major advantage of using modified Laspeyres is that it allows for substitution in elementary indices. The Laspeyres index compares the base period revenue for a set of goods to the current period revenue for the same set of goods.

$$I_i = [(\Sigma Q_o P_o (P_i/P_o))/\Sigma Q_o P_o] \times 100$$

Where: $\mathbf{P_o}$ is the price of a commodity in the base period;
$\mathbf{P_i}$ is the price of a commodity in the current period; and
$\mathbf{Q_o}$ is the quantity of the commodity in the base period.

In this form, the index is the weighted average of price relatives (price ratios for each item . The $= \mathbf{P_i}/\mathbf{P_o}$ expression $\mathbf{Q_o P_o}$ represents the weights in value form.
The quantities (i.e. the weights) were aligned to the price reference period 2017.

1.7 Data collection

Monthly data on revenue/sales and volume is requested from mining companies and utilities authorities. This information is needed to calculate the price per unit for each item. However the unit prices for water and electricity are based on tariff pricing because the monthly revenue does not correlate with the consumption.

1.8 **Prices data used to construct Producer Price Index (Mining and Utilities)**

PPI measures the average change over time in the selling prices received by domestic producers. The prices included in PPI Mining and Utilities are from the transaction prices for mining products, water and electricity bills.

Monthly information on sales in pula and volume, is requested from mining companies. The price per unit is calculated from the information provided by companies. The pricing method used is the unit value where total revenue for each category is divided by the quantity, to give a price per unit (such as price per carat for the diamond, or price per tonne for other products). The use of unit value is only suitable where the products in the calculation are homogeneous. All mining and a sample of quarrying companies are included in the sample.

The tracking of price movements of a particular item (product)should be done in such a way that the item price tracked is consistent with its characteristics (size, model/shape and quality). In the case of mining it is difficult to classify minerals because they come up with different sizes, shapes and quality and hence the average price per unit is used instead of direct prices.

In order to calculate the Utilities Producer Price Index (PPI) the price tariff was used in the short term. This was due to inconsistency in monthly consumption values and sales data, hence the unit value calculated was unstable meaning, the monthly sales received by companies do not correlate with the utilities consumption for that particular month. Even though there is a challenge of the unavailability of the correlated monthly consumption data with the monthly sale, efforts are still being made for the utilities companies to ratify the situation.