Namibia Statistics Agency

NAMIBIA PRODUCER PRICE INDEX (NPPI) SOURCES AND METHODS

January 2023

Vision Statement

“Be a high-performance institution in quality statistics delivery”

Mission Statement

“Leveraging on partnerships and innovative technologies, to produce and disseminate relevant, quality, timely statistics and spatial data that are fit-for-purpose in accordance with international standards and best practice”

Core Values

Integrity
Excellent Performance
Accuracy
Teamwork
Accountability
Transparency

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International Monetary Fund	*(IMF)*
International Standard Industrial Classification	*(ISIC)*
Statistical Business Register	*(SBR)*
National Accountants	*(NA)*
Consumer Price Index	*(CPI)*

1. INTRODUCTION

The Producer Price Index (PPI) measures the average changes in the prices of goods and services received by domestic producers for their output, which is sold on both the domestic and export markets. The Namibia PPIs are output indices, and their concepts and definitions largely follow the guidelines provided in the International Monetary Fund Manual "IMF Producer Price Index Manual Theory and Practice" .

The primary purpose of the PPI is to measure output price inflation by industry to support the compilation of the National Accounts. In the compilation of the National Accounts industry PPIs are used as deflators to produce chain volume measures.

The PPIs are based on a sample of goods that domestic producers provide, so exclude products imported to Namibia. They are compiled by comparing prices in the month under review with the price of the goods in December 2015, which is the price reference period.

Prices are collected monthly, but the indicators are produced and published on a quarterly basis. NSA intends to publish the sector PPIs about 90 days after the end of the reference month to which they relate.

[1] https://www.imf.org/en/Publications/Manuals-Guides/Issues/2016/12/30/Producer-Price-Index-Manual-Theory-and-Practice-16966

2. DEFINITION

The Producer Price Index (PPI) measures the average changes in the prices of goods and services received by domestic producers for the output which is sold on the domestic market as well as on export market. The PPIs that are produced by the Namibia Statistics Agency (NSA) are based on output indices. The concepts and definitions of the PPI follow the guidelines provided in the "IMF Producer Price Index Manual Theory and Practice".

3. SCOPE OF THE NPPI

The NPPI covers establishments falling under the following of the International Standard Industrial Classification (ISIC) Rev.4.

a) **Mining and quarrying:** Cover class indices for Mining of uranium, Non-ferrous metals (copper, gold, lead and zinc), Extraction of salt as well as other mining and quarrying not elsewhere classified (diamonds).

b) **Manufacturing:** Encompasses class indices for processing and preserving of meat; Processing and preserving of fish, crustaceans and molluscs; Processing and preserving of fruit and vegetables; Manufacture of dairy products; Manufacture of grain mill products; Manufacture of bakery products; Manufacture of macaroni, noodles, couscous and similar farinaceous products; Manufacture of malt liquors and malt; Manufacture of soft drinks; production of mineral water and other bottled water; Processing of salt into food-grade salt, e.g. iodized salt; Manufacture of basic precious and other non-ferrous metals, Manufacture of jewelry and related articles (cutting & polishing of diamonds) and Manufacture of cement.

c) **Electricity, gas, steam and air conditioning supply:** Cover index for Electric power generation, transmission and distribution

d) **Water supply; sewerage, waste management and remediation activities:** Water collection, treatment and supply are covered under this category.

4. PPI DATA SOURCES AND WEIGHTS

The weights for PPI were derived from National Account estimates, whereas the turnovers, products and prices for compilation of PPI were sourced from a selection of establishments within the above-mentioned sections (refer to section 2).

5. SELECTION OF ESTABLISHMENTS (PRODUCERS)

In the absence of a complete Statistical Business Register (SBR) in Namibia, the selection of establishments was based on a judgmental sample from a list of known businesses maintained by NSA (National Accounts Sub-Division), expert opinion and practical knowledge of the market were also considered during establishments selection process.

6. SELECTION OF PRODUCTS TO BE PRICED

The selection of items was done using a cumulative cut -off of 80 percent, products have been ranked in ascending order of the value of sales per category and contribution to the gross output or turnover of the selected establishments. All the products that fall within 80 percent cut-off brackets are selected for pricing and in the cases of establishments producing ten products and below, all products have been selected for the index compilation.

7. PRICE COLLECTION

Prices collected for the compilation and production of the NPPI are the basic prices received by the producers for the sale of the products on the local market as well as at international markets (exports). These prices exclude all taxes on products such as excise duty, value added tax (VAT) and transport. Prices are requested from establishments monthly through a self-administered questionnaire which should be submitted to the NSA not later than 15th day after the reference period.

8. WEIGHTS AND A REFERENCE PERIODS

The weights are key elements in the construction of PPI to determine the impact that a particular price change will have on the overall index. 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. December of 2015 is used for price reference period, as well as weight reference period.

9. INDEX CALCULATION

The NPPI is calculated using a short term Laspeyres type formula. The Laspeyres index compares the base period revenue for a set of goods to the current period revenue for the same set of goods. The major advantage of using modified Laspeyres is that it allows for substitution in elementary indices. Prices of December 2015 serve as the basis for price comparisons.

The formula used is given below

$$I_c = \frac{\sum W_i * \left(\frac{P_{ci}}{P_{oi}}\right)}{\sum W_i} * 100$$

Where:
Ic = Index for current month
Wi = Weight associated with product i
Pci = Price of product i for the current month
Poi = Price for product i for the base period

At the item level indices are calculated as unweighted geometric averages of price relatives while the higher-level indices are calculated as weighted arithmetic averages of the item indices.

The indices are weighted separately and at this stage, in the absence of a business register and assured weights for all sectors, it is not possible to combine them to produce an aggregate PPI for all industries.

10. INDEX GENERATION

The NPPIs are compiled in MS Excel files. There are files for each respondent, where the information provided is validated and checked for errors, missing values, and extreme changes in prices. Missing values prompt the Agency to re-contact the respondent to attempt to obtain missing prices. If a price for an item is unavailable it will be imputed using the average movement in prices for other items within the same establishment, industry class or higher-level aggregate as necessary. Missing prices are allowed to be imputed for three periods only before a replacement item should be sought. Replacement items are introduced to the index after two consecutive price observations.

11. IMPUTATION OF MISSING PRICES

The method for imputing for missing prices is to use a class mean approach, which is a standard and recommended solution. All imputed prices are identified in the compilation systems so compilers can see if the prices contributing to the indices are returned or imputed; this again is good practice. The usual approach when compiling price indices is to use imputation only for a limited number of periods, usually for a maximum of three months in a monthly index, and then to replace the item or find a suitable substitute.

When an item is unavailable and a replacement is made, the replacement is selected and introduced into the sample with great care being taken to identify any differences in quality between the original and replacement product.

Imputed prices (overall, targeted or class mean imputation) are used when no replacement and no information is available to estimate the effect on prices of quality changes. The price change of similar products is assumed to be the same as that for the missing products.
If there is a tangible quality difference between the two products this is corrected for to ensure that the difference in quality does not enter as a price effect.

12. DATA ENTRY

Respondent data on prices are entered into the NPPI calculation system. Prices that are denominated in foreign currencies are converted into Namibia dollars using the relevant exchange rate obtained from Bank of Namibia.

13. REPLACEMENT OF ITEMS

When an item is no longer available for pricing by a respondent a replacement item is sought. The prices team selects a replacement either using judgmental sampling or random sampling. Once selected the new

item's weight is derived while keeping the base period weight unchanged (base period weights are held stable between re-basing).

14. REPLACEMENTS AND SUBSTITUTES

The introduction of a replacement item to the index results in the weights changing for the items but not for the enterprise. This should not be confused with substitution, which is where an item may no longer be produced, and a suitable substitute is available.

In doing so due consideration should be exercised in determining whether the substitute is directly comparable or whether there had been some quality change, as the case in the Consumer Price Index CPI. If there is no quality change, so the new item is directly comparable, and no need to make any further adjustments other than changing the name of the item and making a record of the change. If it was not directly comparable than there is a need to make a quality adjustment and introduce the new item with the price amended to reflect the quality adjustment. This is only done for the first period thereafter the interest will be in the month-on-month price relatives so the value of the quality difference is no longer relevant as there will be a comparison of like with like.

15. INTRODUCING A NEW ENTERPRISE TO THE SAMPLE

As the economy is dynamic it is sometimes necessary to introduce new establishments to an index between re-basing programs where new weights and samples of businesses and enterprises are developed. The introduction of a new business should not be done very often; a new enterprise tends not to take a significant amount of market share in a short period, except, perhaps, where it is introducing a novel item to a market sector. As the basic index is designed to compare a fixed basket of goods with a reference period/set one cannot adjust the base weights but can adjust establishment and item weights provided they continue to sum to the correct (class) totals.

It will be important to understand the impact any new establishment will have on the sector and other producers' sales. These issues may mean initiating the inclusion using some assumptions which are then reviewed, and the index revised, as the market develops. The review should consider whether the new entrant will impact on the whole sector it appears in or for specific products within the sector. These are judgments to be made at the time of implementing a change, but which need to be confirmed thereafter.

16. PRODUCT SPECIFICATIONS

The specification of a product selected for the index is important and should define both the item and the terms of its transaction. For example, the quantity purchased in the transaction should be defined and the same quantity should be priced each month. Any discount that applies to the product, for example for a bulk purchase, should also be identified. When collecting the price subsequently, the respondent should be asked to provide a price that includes the discount and confirm that the discount noted (25%, for example) is still valid. The payment terms should also be consistent. Ideally all payment terms should be payment made within 30 days. This avoids any interest charges. Interest charges are not price changes, and these should be avoided. The payment terms should be held constant from month to month.

Even if quantities and payment may differ for the customer from month to month in reality, the specification should be fixed, and the respondent asked to provide a price based on the specification. This allows statistical agencies to make meaningful comparisons of price change across time that are not affected by quality or other changes in specification. In this sense, the prices collected can still be considered as transaction prices even if the customer did not purchase according to the previous specification. It is a transaction price because it reflects the price that would be charged if the defined customer purchased on that basis.

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