



Demystifying Inflation Deceleration

1. Background

In recent months, the Zimbabwe National Statistics Agency (ZIMSTAT) published inflation statistics depicting a decline in both year on year (y-o-y) and month on month (m-o-m) rates of inflation. Whilst the rates of inflation were decreasing, prices of goods and services continued to increase. This development is termed inflation deceleration, a concept which some stakeholders have misinterpreted.

In simple terms, inflation is a sustained increase in the general price level of goods and services. It brings a decrease in purchasing power of a given currency over a specified period of time. The reduction is reflected by an increase in the average price level of a basket of selected goods and services in an economy. Inflation implies that a unit of currency is buying less in the current period than it did in previous periods.

2. Inflation Deceleration

In order to demystify the seemingly contradicting scenario of declining rates of inflation and increasing prices, as reflected in our published inflation statistics, I will use an example of another rate whose characteristics are more familiar to consumers. This rate is speed as measured in kilometers per hour. Speed takes stock of change in distance over time, likewise inflation rate takes stock of the pace at which the general price level of goods and services changes over time.

Thus, inflation could be taken as a moving object, that at one time was moving at 837.5km/hr (read 837.5% y-o-y inflation rate for July 2020). A braking system is then applied to this moving object (read monetary and fiscal policies that retard inflation), and the object decelerates from 837.5km/hr to 194.1km/hr (194.1% being y-o-y rate of inflation for April 2021).

Although the speed of 194.1km/hr shows deceleration from 837.5km/hr, the object is still in high speed and moving forward. The same goes for the y-o-y inflation rates which are decreasing while prices are increasing. This development is termed inflation deceleration, or is referred to as **inflation increasing at a decreasing rate**, which should not be mistaken with a decrease in the price of goods and services.

Internationally, the recommended y-o-y inflation rate that stabilizes an economy is single digit that is, between 0 and 10%. In our moving object example, the application of a braking system would need to continue until its speed is reduced to below 10km/hr. The less than 10km/hr speed would represent a y-o-y inflation rate of less than 10% which represents ideal levels of inflation associated with economic stability.

However, let us note that even when the object is travelling at less than 10km/hr, it will still be moving forward (read prices will still be rising), albeit slowly. A scenario where the general price level is constant would require our symbolic object to be stationary or at zero km/hr.

3. Deflation

For the general price level to fall, our object would need to engage in reverse gear and start moving backwards. This scenario of moving backwards would represent deflation. The speed at which our object moves in reverse gear depends on how much acceleration we apply. Likewise, the rate at which prices decrease depends on the magnitude and dynamics of deflation drivers.

As long as the object is moving forward, it should be taken as exemplifying an increase in the general price level at a pace depicted by the inflation rate. In any case, whenever inflation is greater than zero it should be taken that prices are still increasing. Prices are only expected to fall when we have a negative rate, which is deflation.

4. International Standards and Guidelines

In compiling the Consumer Price Index (CPI), ZIMSTAT, like all other National Statistical Offices, uses international guidelines and manuals which include:

- a) United Nations' Practical Guide to Producing Consumer Price Indices;
- b) United Nations' Consumer Price Index Manual, Theory and Practice; and
- c) Technical Guidance notes on CPI produced by Southern African Development Community (SADC) and Common Market for Eastern and Southern Africa (COMESA).

In addition, the methodology used by ZIMSTAT is periodically reviewed by the International Monetary Fund (IMF), COMESA and SADC.

5. Methodology

Allow me to outline the methodology employed by ZIMSTAT to come up with the Consumer Price Index that is used to calculate inflation rates. I will highlight on sampling, data collection, processing and computation methods. Further, I will discuss the various Consumer Price Indices published by other producers, with respect to their methodologies, baskets and data sources.

Sampling of Outlets

In undertaking the Consumer Price Survey (CPS), ZIMSTAT uses purposive or judgmental sampling of outlets in both urban and rural areas. The sampling approach is the most recommended for such surveys and has the advantage that closed outlets and outlets that change their line of business are easily replaced.

Data Collection

In compiling the Consumer Price Index, ZIMSTAT monitors price levels of 495 products categorized according to United Nations Statistics Division's Classification of Individual Consumption by Purpose (COICOP).

More than four thousand retail outlets in both rural and urban areas are surveyed throughout the country. Among them are supermarkets, general dealers, departmental stores, liquor stores, open markets like Mbare farmers market, fuel service stations and garages, hotels and restaurants, fast foods outlets, bus and taxi companies, hair salons, pharmacies, communication service providers, government and private hospitals as well as rural and urban district councils.

Data on prices is collected in the Consumer Price Survey around the 15th of every month. About thirty-five thousand price observations are collected throughout the country within a five-day data collection period. The data is collected by trained enumerators under the hierarchical supervision of District Team Leaders and Provincial Statisticians, for the entire data collection period.

Currently, data collection for the CPS has progressed from Paper Assisted Personal Interview (PAPI) to Computer Assisted Personal Interview (CAPI). This way, enumerators from all provinces are able to sync data to our servers on a daily basis. Use of CAPI enabled ZIMSTAT to publish inflation statistics 10 days after data collection beginning January 2021, for the first time since inception of the then Central Statistical Office. This makes Zimbabwe the first country in SADC and COMESA which is disseminating inflation statistics within 10 days after data collection.

6. Data Processing and Index Calculation

The processing of CPS data is divided into several stages as indicated below.

Data Consolidation

When data syncing process is completed, data consolidation takes place. Quality control continues by checking that all enumerators have submitted all data to the server and that data was collected within the stipulated period.

Checking of Errors and Inconsistences

After data consolidation, each collected price is checked against the previous price. This process is done for all the thirty-five thousand price observations. Data is checked for errors and inconsistencies, which are then corrected.

Matching of Price Codes

After correcting errors and inconsistencies, the next step is to verify price codes for the thirty-five thousand price observations. Each item for which prices are collected has a corresponding code. Missing items, special offer items and items with varieties that changed also have their respective codes. The idea of matching codes is to ensure that **like** is compared with **like**.

For example, a loaf of bread from company X in March 2021, cannot be compared with a loaf of bread from company Z in April 2021 within that same outlet, even if the quantity and price variations are the same. This is because they are two different brands and cannot be compared. Prices of items on special offer cannot be compared with prices of items which are not on special offer. Likewise, the price of a 10kg and 20kg roller meal packet cannot be compared.

Only the same item varieties are compared and used to calculate price relatives between the two months.

Calculation of Geometric Mean

After matching the codes, price relatives are then calculated. These are calculated using the internationally recommended geometric mean method, as arithmetic mean tends to be more influenced by extreme values.

Computation of the Index

After calculating price relatives by province for the 495 items in the basket, elementary unweighted price indices are then computed using the Jevons formula, as opposed to other methods like Carli or Dutot which make use of arithmetic mean in their computation.

The All Items Index is computed using the arithmetic aggregation of 12 COICOP divisional indices and their respective weights which are shown below:

	Division	Weight (%)
1	Food and non-alcoholic beverages	31.3
2	Alcoholic beverages and tobacco	4.9
3	Clothing and footwear	4.3
4	Housing water electricity gas and other fuels	27.6
5	Furniture, household equipment and maintenance	5.3
6	Health	1.4
7	Transport	8.4
8	Communication	2.7
9	Recreation and culture	2.3
10	Education	4.3
11	Restaurants and hotels	1.1
12	Miscellaneous goods and services	6.5

The above COICOP weights were derived from the last Household Budget Survey known as 2017 Poverty, Income, Consumption and Expenditure Survey (2017 PICES).

7. Computation of Inflation/Deflation Rates

Month-on-Month Inflation Rate

The month-on-month inflation rate is calculated as the percentage change between the current month CPI and the previous month CPI. If the resultant percentage change is positive, it means there is inflation and prices are increasing by certain percentage points from the previous month to the current.

If the resultant percentage change is negative, it means there is deflation and prices are decreasing by a certain percentage points from the previous month to the current.

Month-on-month inflation rate is an important variable in that it compares price change developments over two consecutive months, unlike the year-on-year rate which compares price developments over two points in time that are twelve months apart. The m-o-m rate is better placed in showing the impact of policy changes and a more responsive variable in measuring policy efficacy. Interestingly, the world over economists and consumers focus on the y-o-y rate of inflation.

Year-on-Year Inflation Rate

The year-on-year inflation rate is calculated as the percentage change between the index of the current month of the current year and the index of the same month of the previous year. If the resultant percentage change is positive, then that is inflation. This means that the prices are increasing by certain percentage points from month x of the previous year to a month x of the current year.

If the resultant percentage change is negative, then that is deflation. Deflation means prices are decreasing by certain percentage points from month x of the previous year to a month x of the current year.

Core and Headline Inflation

Justifiably, policy makers are interested more in core inflation than headline inflation which tends to get the attention of most stakeholders.

8. Publication of Inflation Numbers by Individuals and Other Organisations

Although various stakeholders are also producing inflation numbers, we need to be aware of the following:

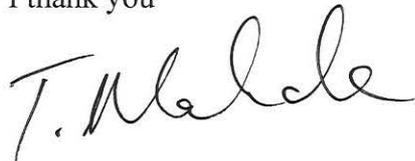
- a) In terms of the Census and Statistics Act, when other stakeholders carry out national surveys, the processes, procedures and methodologies should be reviewed and approved by ZIMSTAT. In most instances, the samples used by some compilers of indices are not exhaustive, which introduces a bias in the result.
- b) Some stakeholders use proxies and secondary data in calculating the index. These two sources of data have some inbuilt errors, which get magnified over time when calculating inflation numbers. ZIMSTAT uses primary data unlike other compilers who indicated that they use secondary data like stock exchange and Purchasing Power Parity (PPP) data among other variables.
 - i) The use of stock market data has limitations in that stock market prices do not reflect the general price level in the economy. This is because the price of a share is determined by profitability of the share's company, speculation and market volatility. This illustrates disadvantage of using stock market share prices to calculate inflation.
 - ii) The PPP is a measurement of prices in different countries that uses prices of specific goods to compare the buying power of countries' currencies. While the PPP theory may be a plausible approach, it has a number of shortcomings, including differences in product quality and existence of trade barriers across countries according to the Reserve Bank of Zimbabwe (2017).

In addition, the composition of the basket of goods used for calculating the consumer price indices differs across countries which makes the use of the PPP methodology to be fundamentally flawed. Further, the presence of non-tradable goods and services, which constitute part of the Consumer Price Survey basket, casts doubts about the plausibility of the PPP theory.

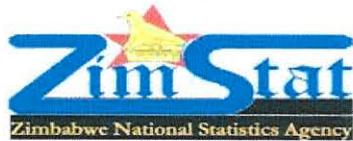
9. Conclusion

In view of the foregoing, ZIMSTAT remains committed to its modernization agenda, which is replacing paper based interviewing with computer assisted interviewing. This is envisaged to produce timely, reliable and accurate statistics in this era of increasing demand for high frequency data. Going forward, more emphasis will be on producing demand-driven statistics for informed policy formulation and decision-making processes.

I thank you



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11th May 2021