The impact of consumer prices on inflation performance in Zambia

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Abstract: Assessing the impact of changes in consumer prices on the performance of the overall inflation in Zambia highlights how diversely each main CPI basket/group affects the trend of the country's inflation. Further splitting of inflation for food and non-food inflation general baskets into the 12 main CPI groups when making the impact assessment to the overall inflation rate improves accuracy of the results/analysis. Economists and statisticians keenly monitor the changes in a country's inflation rate to understand what is going on to that country's economy. By this Zambian policy makers, businesses, financial institutions, markets and other players better position themselves to accurately plan and make decisions. Inelastic goods and services tend to constrain the consumers more as they are most often purchased without exclusion, even though their prices might have otherwise gone upwards. The objective of the paper is to highlight how the different consumer price baskets impact the overall rate of inflation in Zambia. Using quantitative methods, the analysis shows that upwards or downwards movements in rate of inflation for food and no-alcoholic beverages correlates the most with the performance of the overall inflation rate in Zambia while the transportation basket inflated the most in peak value during the period of study from 2007 to 2022. Education and communication CPI baskets show the least correlation and covariance with the overall inflation rate.

Keywords: Inflation, consumer prices, performance

1.0 Introduction

A strong demand and a scarce supply of key items drives those item's prices upwards. The international monetary fund (IMF, 2021) defines inflation as, "the measure of how much more expensive a set of goods and services have become over a certain period, usually a year". Monitoring and studying of the country's inflation gives a better understanding of the country's economic performance. Low inflation rates usually signify that the demand for goods and services is lower than it was before and this characterises slower economic growth

(James, 2021). When people's spending decreases, usually this discourages lenders because it tends to lower interest rates. Lenders typically tend to avoid lending money at rates that give them very small returns. Now, the opposite also happens when inflation rises. It tends to increase the cost of borrowing money, increasing prices for goods and services, and increasing production costs. For this reason, every government pays a keen eye on this key economic performance indicator. Lower and sustainable consumer prices are the central objectives.

Inflation forecasting and targeting, policy making, business planning etc. requires an intricate analysis of persisting factors that cause inflation to become stubborn. Consumer prices through consumer prices indices of major baskets (groups) affect the overall rate of inflation differently. Applying a single answer solution to the analysis of inflation in Zambia may not always yield the best of the required result. Properly analysing how diversely each main CPI group/item affects the trend of the country's inflation, may help to effectively control the rate of inflation. In this paper, an analysis will be done to help show how the different consumer price indices affect inflation trends in Zambia.

2.0 Review and related literature

Inflation is a key indicator in monitoring the macro and micro economics of a country. According to Laidler and Parkin (1977), "inflation is a process in which a country's value of money continuously falls while prices rise continuously". It is a fall in the purchasing power of a given currency over a period of time (Jason, 2021). Inflation seeks to show the overall impact of price changes for a diversified groups of products and services and allows for a quantitative representation of the rise in price levels of goods and services in a country's economy over a period of time.

Chibwe (2014) explored the nature of the relationship between inflation and economic growth in Zambia. He stated that there was no stable long run equilibrium relationship between inflation and the economic growth of a country. However, he stated that a negatively growing economy in the short run significantly affects the inflation rate. Chipili (2021) explains that inflation tends to track the food inflation and that excess supply of maize helps to reduce inflation. When there are instabilities and fluctuations in rainfall and the supply of farming inputs, cultivation of the crops gets impacted thereby affecting food prices.
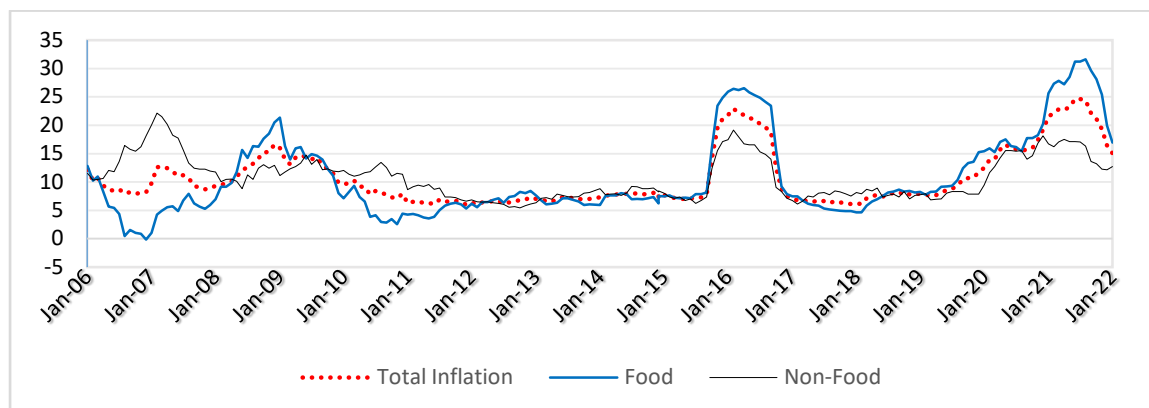
Figure 1.0 Showing food and non-food inflation with the overall inflation from 2006 to 2022 (CSO, 2006 to 2022).

The Mark-up model assumes that the equilibrium price level is set as a mark-up on some combination of input prices. Fluctuations in the inflation rate are then interpreted as marginal adjustments of the reference price level towards a target value (Bawdler and Jansen, 2004). Firms fix administrative prices for their goods by adding to their direct material and labour costs, and some standard mark-up which Covers profit. Labour also seeks wages on the basis of a fixed mark-up over its cost of living. In the long run, the domestic general price level is a mark-up over total unit costs, including unit labour costs, import prices, and energy prices (Gordon and Neil, 1995).

3.0 Data and methodology

The research was done using quantitative methods. Background research of secondary information was done and most of the information and statistics shared in this paper are background researched from published literature and documentation especially from the Central statistical office (CSO) and the Bank of Zambia (BOZ). The research focuses on the period from 2007 to 2022. Methods used in the analysis include graphical analysis and pattern matching, correlation, covariance and standard deviation.

4.0 Results and data analysis

JMP 16.2.0 statistical software was used to facilitate the correlation, relation establishment, comparison making and trend analysis of inflation and consumer price statistics. Graphical analysis and pattern matching, correlation, covariance, standard deviation methods were employed in the analysis as well.

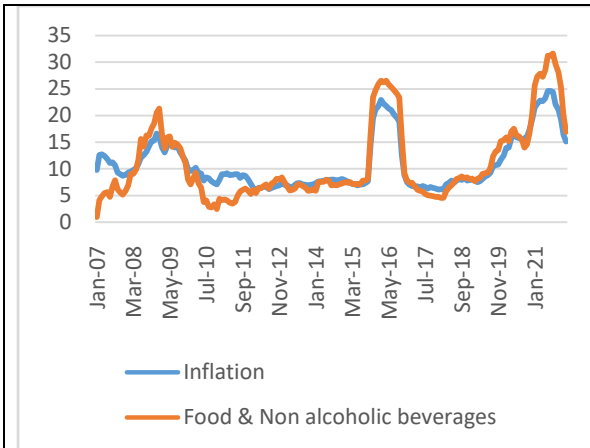## 4.1 Graphical analysis and pattern matching

Figure 2.0 showing the inflation trend of Food and non-alcoholic beverages with that of the overall inflation. Source: CSO (2007 - 2022)
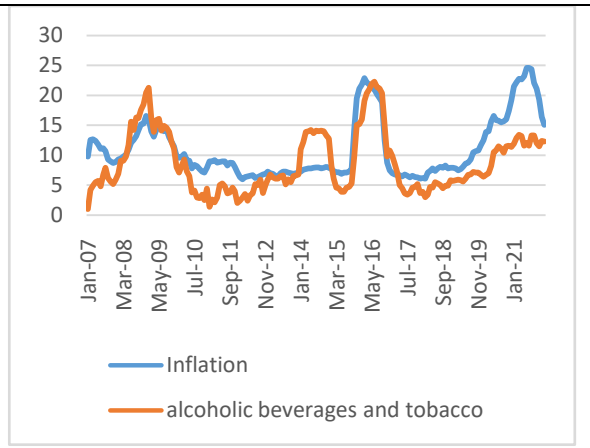

Figure 3.0 showing the inflation trend of alcoholic beverages and tobacco with that of the overall inflation. Source: CSO (2007 - 2022)
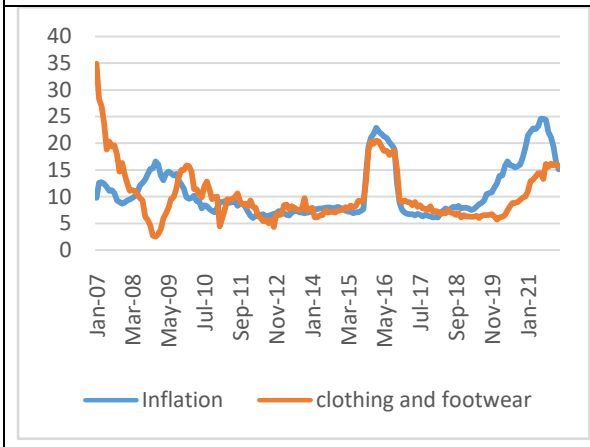

Figure 4.0 showing the inflation trend of clothing and footwear with that of the overall inflation. Source: CSO (2007 -2022)
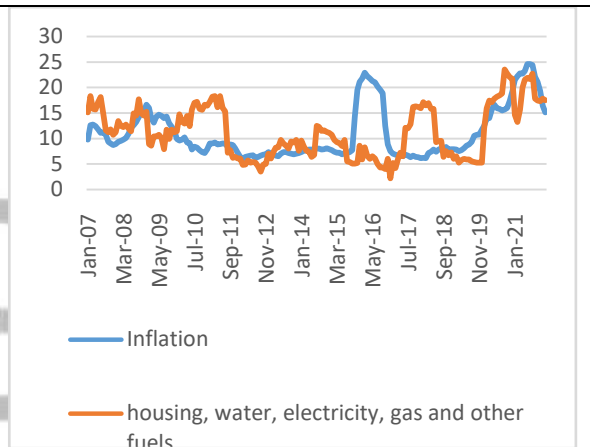

Figure 5.0 showing the inflation trend of housing, water, electricity, gas and other fuels with that of the overall inflation. Source: CSO (2007 -2022)
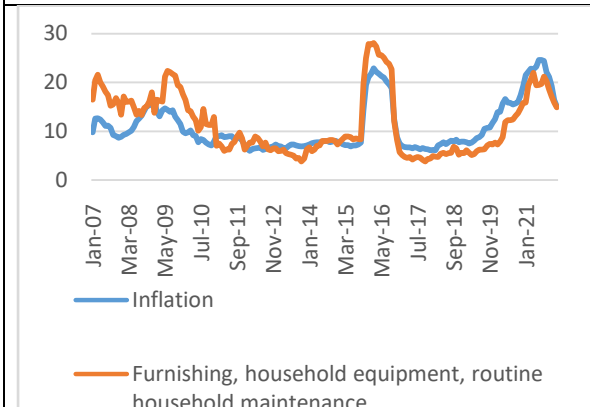

Figure 6.0 showing the inflation trend of furnishing, household equipment, and routine household maintenance with that of the overall inflation. Source: CSO (2007 -2022)
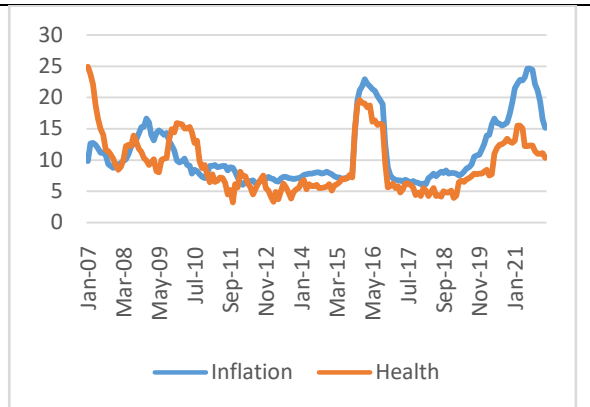

Figure 7.0 showing the inflation trend of health with that of the overall inflation. Source: CSO (2007 -2022)
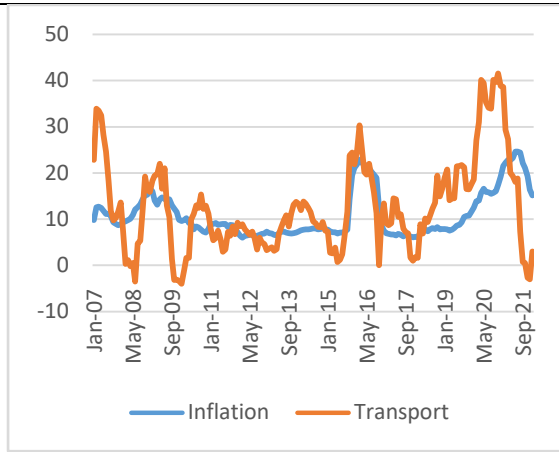
Figure 8.0 showing the inflation trend of transportation with that of the overall inflation. Source: CSO (2007 -2022)
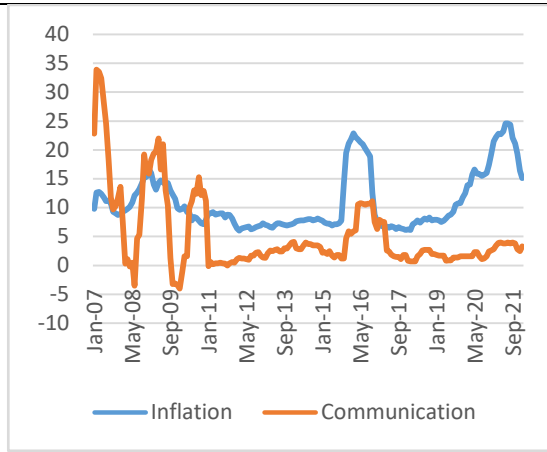

Figure 9.0 showing the inflation trend of communication with that of the overall inflation. Source: CSO (2007 -2022)
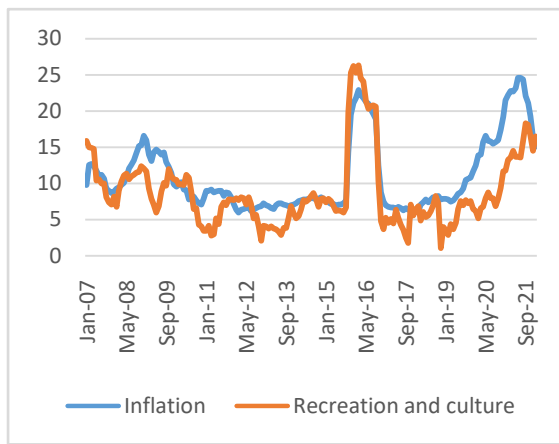

Figure 10.0 showing the inflation trend of recreation and culture with that of the overall inflation. Source: CSO (2007 -2022)
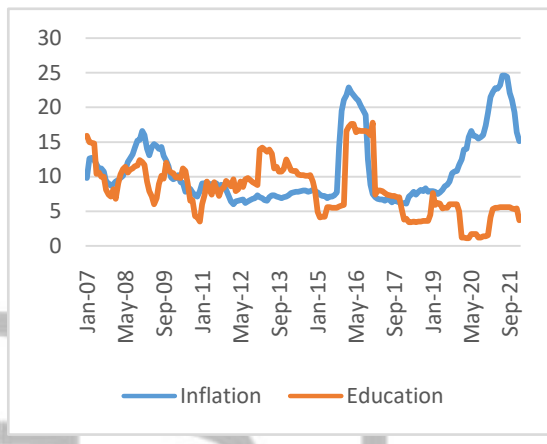

Figure 11.0 showing the inflation trend of education with that of the overall inflation. Source: CSO (2007 -2022)
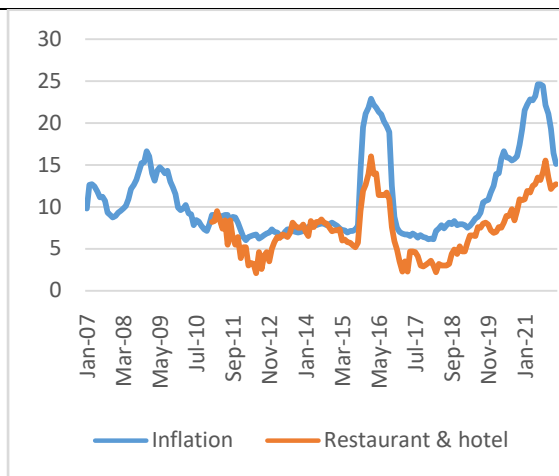

Figure 12.0 showing the inflation trend of restraint and hotel with that of the overall inflation. Source: CSO (2007 -2022)
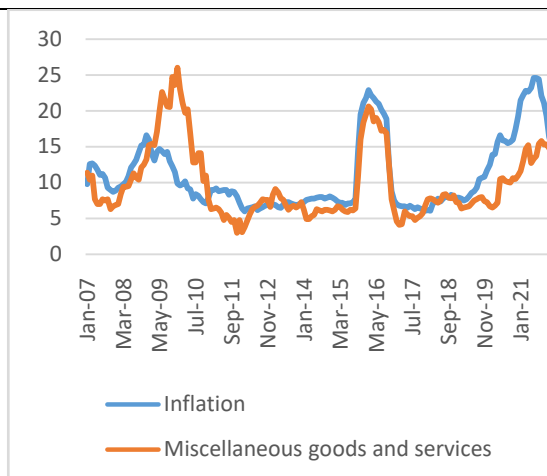

Figure 13.0 showing the inflation trend of miscellaneous goods and services with that of the overall inflation. Source: CSO (2007 -2022)

From the graphical analysis, food and non-alcoholic beverages inflation trends the most with that of the overall inflation. Transportation prices inflated the highest during the study scope with the peak at 41.5% in November of 2020. The period from 2015 to 2017 saw all group's inflations going upwards except for housing, water, electricity, gas and other fuels in figure 6.0. Inflation for housing, water, electricity, gas and other fuels lagged from trending upwards as the others did. It began to start the upward trend from May 2020 to June 2019. Education inflation in figure 13.0 has been trending downwards from November 2017 to January 2022. Peaks have been observed during this time. However, a general downwards trend in the opposite direction of the overall inflation is observed. This might be attributed to infrastructure developments that have seen more schools being built and commissioned. From March 2011, communication inflation in figure 10.0 has been observed to be stable except for the period from 2015 to 2017.

4.3 Mean and Standard deviation, covariance and correlation Analysis

CPI Group	Mean	Standard Deviation	Covariance	Correlation
Food & Non-alcoholic beverages	10.98619	7.231196	34.19903	0.947127
Restaurant & hotel	7.275188	3.256076	15.98247	0.8723433
Furnishing, household equipment, routine household maintenance	11.51326	6.384438	26.00962	0.815861
Recreation and culture	8.778453	5.069597	19.90026	0.786215
alcoholic beverages and tobacco	8.675691	5.055488	17.92837	0.710202
Health	9.225414	4.485088	15.15277	0.67659
Miscellaneous goods and services	9.812707	5.038331	16.11351	0.640485
Transport	12.68619	10.11369	24.59614	0.487037
clothing and footwear	10.17238	5.000312	11.83906	0.47416
housing, water, electricity, gas and other fuels	11.23757	5.055055	8.800759	0.348657
Communication	5.154144	6.776598	7.443247	0.219966
Education	8.281768	3.952804	0.786079	0.039826
Overall inflation	10.97406	4.993389		

Table 1.0 Statistical analysis results

The overall inflation has a mean of 10.97406 during the period of study. Transportation has the highest mean value followed by the furnishing, household equipment, and routine household maintenance CPI group.

4.4 Discussion of results

It can be seen that transportation data is more spread out and this shows the fluctuations in transportation prices mainly attributed to changes in the fuel prices. It's also observed that

food & non-alcoholic beverages CPI group followed by; Furnishing, household equipment, routine household maintenance; and Transport have the highest covariances with the overall inflation. Covariance refers to a systematic relationship between two random variables in which a change in the other reflects a change in one variable and the greater this number, the more reliant the relationship is (Nikita, 2022). Education shows the lowest covariance with the overall inflation. Education and communication CPI baskets show the least correlation with the overall inflation. Food & non-alcoholic beverages CPI group followed by; restaurant and hotel CPI baskets show more correlation to the overall inflation.

The food and non-alcoholic beverages basket items are influenced by several factors. The pass-through effect of the depreciation on the Zambian Kwacha influence prices of imported items in this basket, increased prices of farming inputs i.e., especially mineral and chemical fertilisers, increased fuel prices affecting transportation etc. Compound D fertiliser which is one of the most common fertilisers used in the Zambian agricultural sector saw its price increase from K268 per 50KG bag in 2017 (Nomsa, 2017) to around K985 in April, 2022 (eMsika, 2022). The price changes in the factors of production influence the end consumer price.

6.0 Conclusion and recommendations

From the analysis, it can be concluded that upward or downward movements in the inflation rate for food and no-alcoholic beverages correlate the most with the performance of the overall inflation rate in Zambia. Policy makers need to improve the factors of production for food and non-alcoholic beverages. This will highly improve the performance oof the rate of inflation in Zambia. Local manufacturing of fertilisers and other farming inputs needs to be fast tracked. Furthermore, fruit farming and robust mechanisms to produce local non-alcoholic beverages needs to be promoted. The furnishing, household equipment, routine household maintenance CPI basket is the second most covariant inflation rate to the overall inflation rate and it's the third most correlating CPI basket to the overall inflation according to table 1.0 above. It can be concluded that inflation changes in this basket contribute cohesively to the overall inflation rate. Education and communication CPI baskets show the least correlation and covariance with the overall inflation rate. Transportation prices inflated the highest during the study scope with the peak at 41.5% in November of 2020. The period from 2015 to 2017 saw all group's inflations go upwards except for housing, water, electricity, gas and other fuels in figure 6.0. Inflation for housing, water, electricity, gas and

other fuels lagged from trending upwards as the others did. It began to start the upward trend from May 2020 to June 2019.

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