Abstract

1. Introduction:

Inflation in India has always been at highlight owing to its changing pattern. In India, there is no single measure of inflation which reflects the economy-wide inflationary pressures. It is the Wholesale Price Index (WPI), which has been used as the primary indicator of headline inflation in India till 2014. Although there are four Consumer Price Indices (CPIs), they are targeted at different population groups and none of them actually captures the impact of price rise in the country properly. Therefore, very recently, the CPI (Rural), CPI (Urban) and CPI (Combined) have been launched, in order to capture the impact of price rise in the rural areas and urban areas separately. The CPI (Combined) provides an aggregate measure of the inflation rate by combining the CPI (Rural) and CPI (Urban), thereby reflecting the impact of price rise on both the rural and urban population.

2. Research Objectives of the Study:

1. To make an assessment of the most commonly used inflation indicator CPI of a few South Asian Nations along with special reference to the developed economies of China, U.K. & U.S.A. (By comparing the Base year, Weights, Commodity basket and Trends in inflation rates).
2. To understand India’s WPI and CPI in detail, as well as to identify the gap in the basket of all commodities between these two indices.

3. To investigate the causality and cointegrating relationship among inflation rates measured by CPI and WPI with ten macro-economic variables, namely Gross Domestic Product (GDP), Index of Industrial production (IIP), Broad Money (M3), Narrow Money (M1), Exports (EXP), Imports (IMP), Oil Exports (Oil EXP), Oil Imports (Oil IMP), Gross Fiscal Deficit (GFD), and Foreign Exchange Reserves (Forex).

4. To understand the dynamics of Core Inflation in India in terms of the following:
   i. To identify measures of core inflation that can help in predicting headline inflation CPI and WPI.
   ii. To examine the volatility of measures of core inflation with the headline inflation CPI and WPI.
   iii. To examine the direction of causality between core inflation measures and headline inflation CPI and WPI.

5. To find the extent to which the commodity basket of the New CPI/WPI reflects the consumption pattern of common masses, and comparing its efficiency with that of the existing WPI/CPI (Food component).
3. Research Methodology:
   
i. Research Design: The research design is purely exploratory in nature.

ii. Primary Data Sources: Close observation of buying behaviour of the consumers belonging to different income strata at the retail stores, wholesale outlets and weekly bazaars was undertaken.

iii. Secondary Data Sources: The secondary data has been mainly collected from the official websites, books and reports.

iv. Questionnaire Construction: The questionnaire based upon the fifth objective of the study consist of a hypothetical food component of the index, aiming at obtaining information regarding the monthly purchase behaviour of common masses.

v. Limitations: The major limitation of this study is that it is confined to the Guwahati city only. Besides, due to the reluctant nature, some respondents were not very forthcoming with the responses.

vi. Analysis Techniques Used: Unit Root test, Augmented Dickey Fuller test, Granger Causality test, Cointegration and Vector Error Correction Model, Regression, and GARCH model are the tools used for the study.

4. Major Findings and Conclusions:

i. The distinguishing characteristics of the different nations with respect to their CPI methodology are found to be the following:
• The base year used to compose the CPI of the different South Asian Countries are found to be different.

• The composition of the commodity basket is also found to be quite different.

• The South Asian Countries like India, Bangladesh, Pakistan, and Sri Lanka had assigned the highest weightage to the “Food” component, indicating more vulnerability to food-inflation, whereas the developed nations like U.K. and U.S.A. assigned very low weights to the CPI “food” component.

ii. The CPI (base year 2012) and WPI (base year 2004-05) differed conceptually from each other on the following grounds:

• The New CPI with base year 2012 comprises 299 commodities, whereas the revised WPI with base year 2004-05 incorporated a basket with 676 commodities.

• The New CPI basket has six sub-groups including food and beverages, fuel and light, housing and clothing, bedding and footwear, Miscellaneous and Pan, tobacco and intoxicants, while the WPI comprised of three broad divisions, namely, Primary Articles, Fuel & Power and Manufactured Products.

• The highest weightage in CPI (C) has been assigned to the Food and Beverages group (45.86%), but in WPI, the highest weightage has been given to the Manufacturing Products (64.97%).
• The composition of the New CPI and WPI is such that the weight of Food Products is much higher in CPI (45.86%) as compared to WPI around (25% approx.). As a result, the CPI is more susceptible to changes in food prices than the WPI. Again, in case of Fuel and Power the weight is 6.84 in New CPI, whereas it is 14.91 in WPI. Thus, WPI is more sensitive to changes in fuel prices.

• Another important difference arises from the fact that while WPI does not cover services, the commodity basket of New CPI includes certain personal services.

iii. The causal and cointegrating relationship between WPI/CPI and different macroeconomic variables suggested the following:

• All the ten macro variables and the WPI, CPI(R), CPI(U) and CPI(C) are found to be non-stationary at levels and stationary at first difference, indicating same order of integration at I (1) for all the variables.

• Bidirectional Granger causality has been found between WPI and the five macro variables GDP, M1, Export, Oil Exports and Oil Imports.

• CPI (R) is found to have bidirectional granger causality with the three macro variables i.e. IIP, Export and Import.

• India’s present main inflation indicator CPI (C) is found to make short-run adjustment with changes in GDP, IIP, and Oil Export products.

• GDP is found to have positive significant relationship with CPI (C).
• IIP is also found to have a significant relationship with CPI (C); however the negative coefficient indicates that CPI (C) would fall 1.678 percent with 1 percent rise in IIP.

• Both M3 and M1 have significant positive relationship with CPI (C).

• Exports (EXP) is also found to have significant positive relationship with CPI (C).

• Imports (IMP) too, is found to have significant relationship with CPI (C) and indicates that 1 percent increase in import would lead to rise in 2 percent in price level on the average in the long run.

iv. While analyzing the importance of the concept of core inflation as a reflector of long-term trend in price level, the following conclusions could be derived:

a. Predictability

• In this study, in case of headline inflation CPI (R), it has been found that it fully reverts to the core inflation measure CPI (R) Excluding Food for a time-period of 1 month. Whereas, the headline inflation CPI (U) and CPI (C) do not revert back to the core measure i.e. CPI(U) Excluding Food and CPI(C) Excluding Food, for time-period of 1 month. The food volatility is expected to be of transient nature for 1 month period.

• The Headline CPI (U) is the only measure that reverts back to the core CPI (U) Excluding Food and Fuel for the three time-periods. Thereby CPI (U) Excluding Food and Fuel is found to a stable measure.
• Similarly, it could be found that, for a time-period of 1, 2 and 3 months, the headline inflation WPI is found to revert back to the core measure WPI Excluding Fuel. It may be due to the volatility component of fuel prices in the 1, 2 and 3 months period.

• Headline inflation WPI is found to revert back to the core measure WPI Excluding Food for period of 2 months and 3 months respectively. Wholesale food prices are found to be volatile in period of 2 to 3 months rather than 1 month period as in the case of retail prices of CPI.

b. Volatility

• For the core measures of CPI (R), i.e. CPI (R) Excluding Food and CPI (R) Excluding Food & Fuel, both the terms ARCH(1) and GARCH (1) are found to be significant at 5% level of significance with $p< 0.000$. However the sum of the ARCH and GARCH coefficients are 0.88 and 0.89 for CPI (R) Excluding Food and CPI (R) Excluding Food & Fuel, indicating that volatility shocks are quite persistent.

• CPI (U) Excluding Food indicated medium persistency in volatility shocks.

• However, for CPI (U) Excluding Food & Fuel, both ARCH (1) and GARCH (1) terms are found to be insignificant at 5% level of significance.

• For CPI (C) Excluding Food and CPI (C) Excluding Food & Fuel, the volatility shocks are quite persistent. Especially for CPI (C) Excluding Food & Fuel, the sum of ARCH and GARCH coefficients being almost 1 implies that the
movements of the conditional variance away from its long-run mean last for a long time.

c. Causality

- The direction of causality indicated that, CPI (U) and CPI (U) Excluding Food and Fuel has one-way causality for both lags. Similarly, it is found that there is one-way causality between the CPI(C) and CPI(C) Excluding Food as well as CPI (C) and CPI(C) Excluding Food & Fuel, for both the lags 1 and 2.
- WPI and WPI excluding Food exhibits two way causality at lag 1.
- At lag 2, Headline WPI is found to Granger cause WPI excluding Fuel at 5\% level of significance as p< 0.036.
- Similarly WPI and WPI excluding Food and Fuel exhibits two way causality at lag 1.

Thus, “CPI (U) Excluding Food and Fuel” can be considered as a suitable measure for core inflation in India in terms of predictability, volatility and causality.

v. The questionnaire survey revealed that for the different food segments, the affordable capacity of the high income group (as evident) is more than the other groups. The survey also revealed certain food items which were initially not covered by the WPI commodity basket. But, later in 2014, when the government of India decided to consider the CPI as the major indicator of inflation in India, it was
found that the New CPI basket had included most of the items that were not included in the WPI basket.

However, in a very recent WPI Revision, that is in May 2017, of WPI base year from (2004-05) to (2011-12), it could be found that the food items which had been found missing in the WPI series 2004-05 (though these items were of high importance to consumers) had been introduced in the New Revised WPI series with base year 2011-2012. Thus, it could be mentioned that this research work had been quite productive because the findings of this survey had been already implemented by the government of India in the form of recent revision of the WPI base year.

Finally, from the analysis of objective 5, it can be concluded that the study finds differences in the purchase behaviour of all the different income groups for the different food items. In calculating the CPI (Refer section 5.2.7) according to the Laspeyre’s formula, quantity purchased influences the index value. As can be seen from the study, that the mean consumption values of different food items vary greatly from low-income to high-income group, as such the CPI value would also vary according to the time and place from where the quantity consumption data has been collected.