

## Impact of commodities with high inflationary potential

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India's inflation has witnessed considerable volatility in the last few years. From episodes of low inflation, it overshoot RBI's 4+/-2% bandwidth. However, a statistical evaluation of the entire disaggregated series of CPI shows that volatility is concentrated in few food items. At times, fuel products have also exhibited high annualized average monthly volatility which was mainly due to changes in retail prices at certain points of time. The distribution of inflation also witnessed positive skewness in the past two years and higher kurtosis (>3), which indicates that due to certain specific items, inflation is ruling higher.

The analysis here looks at commodities in the CPI basket which have witnessed high inflation and volatility in the last few years relative to the headline numbers and examines their price movements as represented by a combined index called 'CPI-volatile Index'. The CPI-volatile series indicates that most of the overshooting of CPI beyond its 6% level is attributable to higher inflation in these few items. In May'24, these volatile items pushed up CPI by 1.5%. Historically as well, in most of the periods, these volatile items have been responsible for higher inflation.

### Background:

Inflation trajectory has evolved interestingly since FY19. We witnessed episodes of low inflation just prior to the pandemic period (FY18 and FY19), supported by benign food inflation. The pandemic witnessed a slack in demand conditions and core inflation softened. However, with resumption of economic activity, inflation numbers witnessed an upturn with normalization in core inflation and food prices spiraling on account of a variety of factors. This can be attributed to both domestic factors (crop failures) as well as global factors (disruptions due to wars).

**Table 1: Trend of inflation and its components**

Inflation (% YoY)	Headline CPI	Food inflation	Core (excl. food and fuel)
FY19	3.4	0.2	5.8
FY20	4.8	6.7	4.0
FY21	6.2	7.8	5.7
FY22	5.5	3.8	6.1
FY23	6.7	6.6	6.1
FY24	5.4	7.5	4.3

Source: CMIE, Bank of Baroda Research

High headline inflation has tended to be associated with higher food inflation in most of the years. Food inflation was lowest in FY19 when headline inflation was low at 3.4%.

### Distribution is skewed and leptokurtic

From the shape of the distribution, a lot can be inferred about how the inflation trajectory has panned out since pandemic. Here specific episodes have been used for a clear understanding or nature of inflation. The recent data shows a positively skewed distribution with higher kurtosis. For food, inflation, the peak as measured by Kurtosis is even pronounced, thus showing most of the outlier observations which have increased in recent years emanate from food items which is pushing headline CPI number higher.

**Table 2: Results**

Headline CPI	Kurtosis	Skewness
FY18-19	0.68	0.76
FY23-24 & 2 months of FY25	5.29	1.30

Source: Bank of Baroda Research

**Table 3: Results**

CPI-Food	Kurtosis	Skewness
FY18-19	0.23	0.61
FY23-24 & 2 months of FY25	7.14	2.01

Source: Bank of Baroda Research

### Inflation for past 5 years

The average inflation rate since FY19 was 5.3%. A closer evaluation of 299 disaggregated items of CPI shows that items with 20% weightage in the overall CPI basket have reported average inflation more than the headline CPI during this period. Among these items, food products have a major share of 45%. Within food, 38% of items are vegetables. 11 of the 26 items of vegetables fall in this category with steep increases witnessed and include garlic, ginger, potato, onion and tomato whose average inflation exceeded headline average in the range of 6-15%.

Among other items are spices, where the average inflation of jeera, dry chilies are very high. Meat and fish components also exhibited high inflation which is also indirectly linked to food and oil prices because of oil cake consumption as fodder for poultry. Within pulses, moong and arhar, which have higher weight in overall pulses, have exhibited significant divergence from average inflation.

**Table 4: Component wise picture of average inflation**

Food	Number of items higher than average headline	Number of items in the CPI basket	Share in respective baskets
Vegetables	11	26	42.3
Spices	4	9	44.4
Meat & fish	4	6	66.7
Pulses	3	12	25.0

Source: Bank of Baroda Research

## Volatility

Headline CPI has exhibited annualized average monthly volatility of 3.3%. Within the disaggregated items some components of food showed maximum volatility. What comes as a comfort is that the number of these items is limited and most of the increases are also not a persistent phenomenon. 56.5% of the items in the CPI with weight of 64% had volatility of less than 10. Only 12 items had volatility of over 100 while 21 had in the range of 50-100%.

**Table 5: Volatility**

Annualised average monthly volatility	Wt in CPI	Number of items	Number of F&B items	Share of F&B in total items
0-10	63.99	169	45	26.6
10-50	22.53	88	53	60.2
50-100	9.77	21	11	52.4
>100	3.36	12	11	91.7

Source: Bank of Baroda Research Note: weights not adding up to 100 as series of some items are missing

Next, we chart out how different items fall in different inflation bands. **Table 6** points out two different things. 1) Most of the food products have an inflation range within MPC's bandwidth. 2) However, the tail becomes heavier towards higher end of inflation spectrum due to concentration of few food products. These items are causing CPI to diverge its projected path. In the 6-8% average inflation band as well, food has more than 40% share and majority of the rest are miscellaneous items (components of core inflation).

**Table 6: Grouping with respect to Average inflation**

Average inflation since FY19 (% YoY)	Number of items	Wts	Number of F&B items	Share of F&B in total items
0-2	22	7.17	10	45.5
2-4	108	36.33	40	37.0
4-6	108	42.96	45	41.7
6-8	24	6.04	10	41.7
8-10	8	1.29	4	50.0
>10	11	5.24	8	72.7

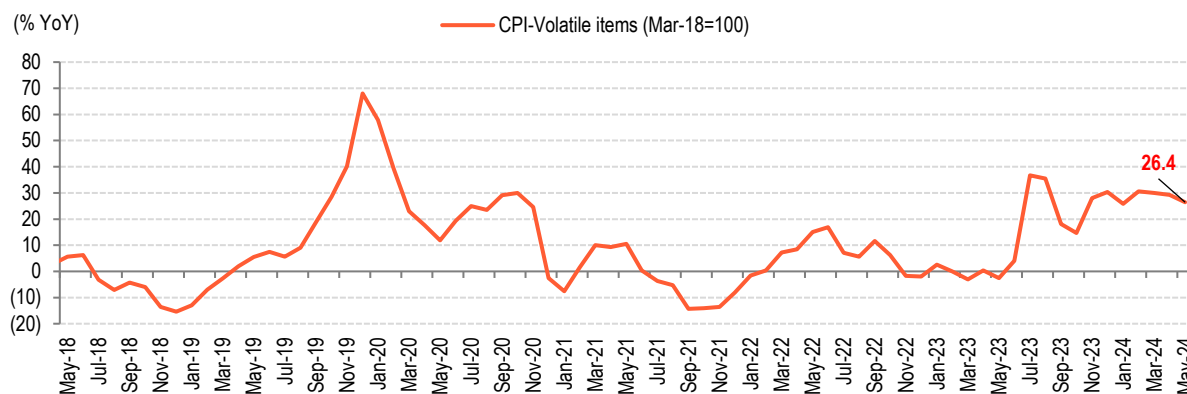
Source: Bank of Baroda Research, Note: weights not adding up to 100 as series of some items are missing

## CPI volatile items and BOB ECI:

In the next exercise, we chart out the volatile items of CPI based on certain criteria such as items having higher annualized average monthly volatility and items whose average inflation far outweighed headline CPI consistently since pre pandemic (FY19). Certain items which bear the impact of Russia Ukraine war especially fuel and transport and communication components have been kept out as these are transient phenomenon. However, the number and share of those items in the overall CPI basket is limited. The CPI volatile items have an overall weight of 5.48% and include potato, tomato, onion, tur, garlic, jeera, chicken and dry chilies. Notably, the CPI volatile items have been rebased to Mar-17, for the purpose of parity in our analysis, as this study mostly focuses on pre- pandemic (since

FY19). The CPI-volatile series has an annualized average monthly volatility of 45.9%, which is far higher than headline equivalent number of 3.3%. However, with small weight, the quantum of their increase has been higher and current run rate is above 20%. Thus, we believe because of this volatility index, CPI was 1.5% higher in May'24. Notably, in previous episodes, it was seen that whenever CPI-volatile index has posted a higher inflation rate of above 20%, CPI had the tendency of posting an above 6.5% number (Jul-Nov'20).

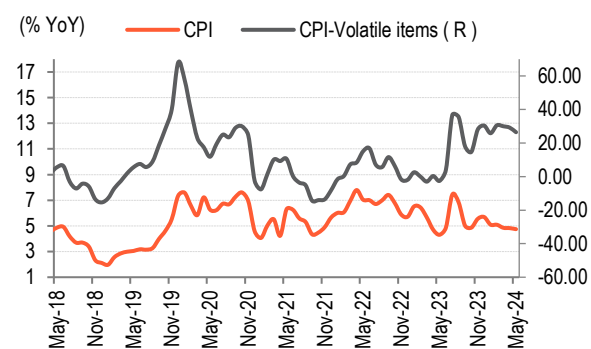
**Figure 1: Trajectory of CPI-volatile index**



Source: CEIC, Bank of Baroda Research

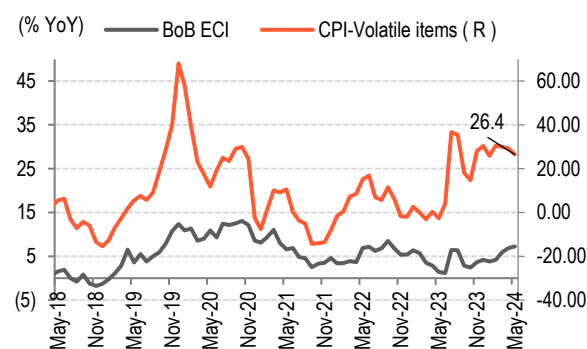
In 27 of 62 episodes monitored by us, the overshooting of CPI above 6% upper bandwidth has happened due to the CPI volatile items. Notably, the CPI-volatile series has a fair degree of positive correlation with BoB ECI at 0.54. Our BoB ECI, on YoY basis for Jun'24 and Jul'24 is at 7.8% and 3.3% respectively.

**Figure 2: Much of the volatility in CPI is reflected**



Source: CMIE, Bank of Baroda Research

**Figure 3: BOB ECI and CPI volatile items**



Source: CMIE, Bank of Baroda Research

**Conclusion**

Repeated worrisome prints of CPI are posted due to significantly higher inflation skewed in certain commodities. Thus, inflation is not broad based. Even discounting seasonal variation only 8 commodities out of the 299 disaggregated list have been charted out as per higher deviation from average inflation and having significant annualized average monthly volatility. The correction of their trajectory is contingent on concrete supply management policies of the government which has been seen in the past as well.

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