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Understanding goods and services inflation in India

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Background

In recent months, there has been a growing concern around elevated services inflation. In the US, while the falling goods inflation has helped pull down the overall inflation, the pace of price increases among services has remained high. These patterns have led Federal Reserve Chair Jerome Powell and fellow officials to closely monitor services inflation in their decision to tighten interest rates further. In India too, there are concerns around rising costs of services such as healthcare, education and housing.

In this backdrop, this note presents a discussion on recent trends in goods and services inflation in India. The note also talks about the key drivers of goods and services inflation in the recent months. This requires disaggregating the overall Consumer Price Index (CPI) into goods and services consumer price index. The key finding emerging from the analysis is that unlike in the U.S, inflation dynamics in India are primarily influenced by goods. Infact, services inflation has seen a moderation in the recent months

Methodology to construct Goods and services CPI Index and an assessment of contribution

The official estimates of CPI inflation do not release estimates of Goods and Services inflation separately. For the purpose, we use the information that Ministry of Statistics and Programme Implementation (MOSPI) provides while classifying the 299 items in the CPI basket. Each of the 299 items used in construction of CPI, is assigned a unique 9-digit coding structure (A.B.CD.E.F.G.H.I). The table below summaries and explains the hierarchical coding structure of each item:

In the unique code, the 6th digit identifies items under the categories 'Goods' and 'Services'. Digit “1” represents goods while the digit “2” represents services.

Table 1: Illustration for identifying items as Goods or Services

Group Code Digit	Items	Goods / Services
6	Miscellaneous	
6.1.01	Household goods and services	
6.1.01.6	Household goods	
6.1.01.6.1.01.X	Bucket, water bottle/ feeding bottle & other plastic goods	Goods
6.1.01.6.1.02.0	Coir, rope, etc.	Goods
6.1.01.6.1.03.0	Washing soap/soda/powder	Goods
6.1.01.6.1.04.0	Other washing requisites	Goods
6.1.01.6.1.05.X	Incense (agarbatti), room freshener	Goods
6.1.01.7	Household services	
6.1.01.7.2.01.X	Domestic servant/cook	Services
6.1.01.7.2.03.0	Sweeper	Services
6.1.01.7.2.05.0	Monthly Maintainance charges	Services
6.1.01.7.2.07.X	Other consumer services excluding conveyance	Services

Out of the 299 items in the CPI basket, 40 items represent services, while the remaining 259 items represent goods. Together, the 40 items representing 'Services' account for 23.36 percent of the total weight, while the 259 items representing 'Goods' account for 76.6 percent of the overall CPI basket.

Table 2 shows the distribution of goods and services in the broad categories of the CPI. Table shows that most of the services (33 out of 40) are categorised in the “Miscellaneous” category of the CPI. These account for roughly half of the overall weightage of services in the CPI.

Table 2: CPI: Goods and Services by weight and item count

Group Name	Goods		Services		Total	
	Weight	Count	Weight	Count	Weight	Count
CPI Cereals and Products	9.349	19	0.324	1	9.674	20
CPI Pulses and Products	2.384	12			2.384	12
CPI Sugar & Confectionery and Spices	3.859	16			3.859	16
CPI Vegetables	6.039	21			6.039	21
CPI Egg, Meat, Fish, Milk & Milk Products and Oils & Fats	14.208	19			14.208	19
CPI Fruits	2.891	26			2.891	26
CPI Non-alcoholic Beverages and Prepared Meals, Snacks, Sweets etc	6.807	13			6.807	13
CPI Pan, Tobacco and Intoxicants	2.38	16			2.380	16
CPI Clothing and Footwear	6.014	25	0.514	2	6.527	27
CPI Housing and Fuel & Light	6.843	11	10.070	4	16.913	15
CPI Miscellaneous	15.858	81	12.459	33	28.317	114
Total	**76.633**	**259**	**23.367**	**40**	**100.000**	**299**

After identifying the goods and services components

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within the CPI basket, the next step is the construction of the goods and services price index. The item-wise price index published by MOSPI is used to construct the CPI-Services and CPI-Goods series. Even though the CPI data for the current base year dates back to 2012, item-by-item information is available only since January 2014. In view of this, the exercise for construction of CPI-Goods and CPI-Services begins from January 2014.

$$\text{CPI Index} = \sum_{i=1}^{259} (WG_i/76.6) \times PG_i + \sum_{i=1}^{40} (WS_i/23.4) \times PS_i$$

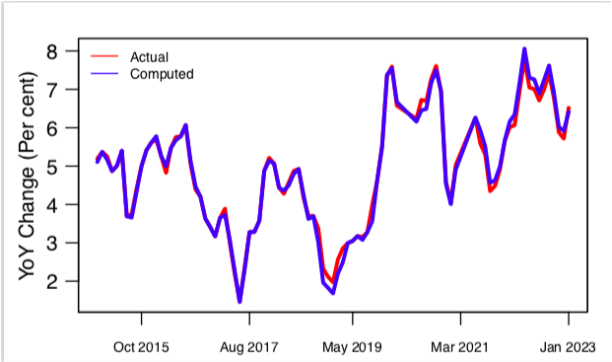
To arrive at the overall CPI index, the sum total of weighted average of goods and services indices is used.

Here, WG is the weight of indi0vidual goods items, WS is the weight of individual services items, PG is the price index for individual goods items and PS refers to the price for individual service items.

Validation of the CPI constructed and the actual series

To validate our approach of construction of goods and services CPI, the year-on-year change (Y-o-Y) in the actual CPI is superposed against the Y-o-Y change in the computed CPI, which is the weighted average of the CPI-Services and CPI-Goods (See Figure 1). The computed CPI Y-o-Y change is seen to mirror the trajectory of the actual CPI, barring some minor deviations[1].

Figure 1: CPI: Actual and Computed (Y-o-Y change)



Trends in CPI Goods inflation

The direction and the trend of the overall inflation is seen to be influenced by the direction and trend of the CPI Goods Inflation. Although the Monetary Policy Committee (MPC) targets headline inflation, it is worthwhile to look at the trajectories of CPI Goods and Services inflation separately to better understand the drivers of high inflation (See, Figure 2). Since 2015, broadly, there are four episodes where CPI Goods inflation breached the higher and lower threshold of 2 and 6 percent respectively. Inflation based on CPI Services is seen to have breached the 4+/-2 percent threshold only once.

- The first episode of breach (of lower threshold) happened in May-July 2017. CPI Goods recorded its lowest inflation of 0.7 percent in June 2017. The second episode of breaching the lower threshold happened during the second-half of FY 2018-19 during October 2018 – March 2019.
- The above episodes of CPI Goods breaching the lower threshold of 2 percent were mainly driven by a drop in inflation in all sub-groups of Consumer Food Price Index (CFPI) except 'meat & fish'. Amongst the items which saw major decline in prices were Vegetables,

[1] The deviation is on account of two reasons:

- The rounding off of weights and calculations done by the authors
- The authors have not taken into consideration the exercise of adjusting the weight of few seasonal items among the remaining items of the Section/sub-group, while computing the CPI. Example of adjustment of weights-When the prices of fresh fruits and vegetables, excluding pickles, chips, potato and onion, are not reported in a particular month, the weight of such items are distributed on pro-rata basis to other items of the respective Section/Sub-group, as the case may be.

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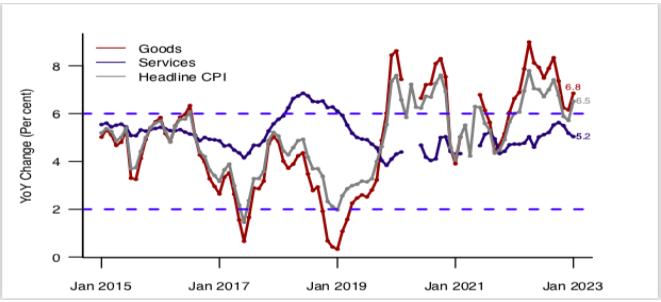
Mustard oil, Pulses etc.

- The third episode of breach happened during Dec 2019-Nov 2020. During this period, the CPI goods inflation surpassed the upper threshold of 6 percent. Within various groups of CPI Goods, the increase in inflation was mainly driven by a rise in food inflation, during Dec 2019-Nov 2020 owing to build up in Vegetable (21.9)[2], Pulses (17.3), Spices (10.9), Oil & fats (10.9) and Egg, fish and meat inflation (14). The high vegetable prices was mainly on account of lower output for onion and potato due to crop damage by excessive rains. However, the swift steps taken by the Government helped to ease CPI Food inflation in the subsequent months.
- The fourth episode of breach of inflation target commenced in January 2022 and continues even now. The higher CPI goods inflation was observed following the supply-chain disruptions owing to the Russia-Ukraine war. This was further fuelled by the shortfall in the production of crops on account of heat waves. During the calendar year 2022 – CPI Goods inflation recorded an average of 7.5 percent. This high inflation phase of CPI Goods was reflected in the elevated inflation also, which averaged at 6.7 percent during the calendar year 2022.
- The rise in goods inflation during this episode was broad-based. Higher prices were recorded across categories like Food & beverages, Clothing & Footwear, and Fuel & Light during the Jan-Dec 2022 period.

Figure 2: CPI: Goods, Services and Headline CPI (Y-o-Y change)



Trends in CPI Services inflation

- Inflation in CPI-Services has generally remained range-bound between 4-6 percent except during March 2018 to January 2019 when it breached the upper threshold of 6 percent. This was on account of the revised HRA structure under the 7th Central Pay Commission (CPC). As per the recommendation of the 7th CPC, the basic pay of government employees rose by a factor of 2.57, accordingly, HRA stood revised by 105.6 per cent, i.e., by more than double the pre-CPC level[3].
- The impact of the revision can be understood from the survey undertaken to construct the CPI-Housing index. Of the total sample of households that are surveyed for the purpose, 14 percent are government accommodations. The sustained (as opposed to a one off) increase in the CPI-Housing during this period could be on account of the chain-base surveying where every month a fixed sample of nearly 2200 such government household accommodations are surveyed. The increase in the HRA also influences the rental of private accommodations.
- This was further sustained on account of State governments such as Maharashtra and Madhya Pradesh implementing the recommendations of the 7th Pay Commission.
- In contrast to the inflation in goods, inflation in services moderated to 5.2 per cent in January 2023 from a high of 5.6 percent recorded in September 2022.

Contribution of goods and services inflation to the overall inflation

Large swings in inflation may not have a significant impact on the headline inflation if the weights of commodities experiencing high inflation in the overall basket is small. Here the assessment of *contribution,* which takes into account both price rise and weights becomes useful. For this, we look at the contribution of the individual goods and services items using the given formula:

[2] Figure in parenthesis is YoY Change for Dec 2019-Nov 2020 as compared to Dec 2018-Nov 2019

[3] https://rbidocs.rbi.org.in/rdocs/MintStreetMemos/CPCHRA230418.pdf

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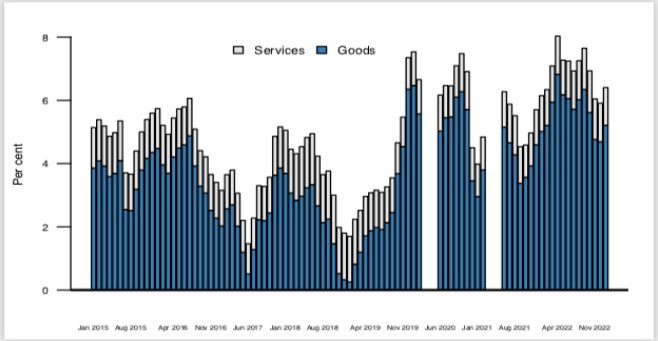
$$\text{CPI (YoY Change)} = \sum_{i=1}^{299} w_i /100 \times ((P_t - P_{t-12})/CPI_{t-12}))*100$$

Where Wi represents weight of the individual commodity item, Pt represents price index of the ith on time t, Pt-12 is price index of the ith item 12 months ago and CPIt-12 represents headline CPI price index 12 months ago.

The contribution of CPI-services to the headline inflation has remained sticky around 1-1.5 percent while CPI-goods contribution has always been more than that of services except for some specific instances observed in 2017 and some months in 2019 (See Figure 3). Nearly 3/4th of the contribution to the overall CPI comes from CPI Goods reflecting its weight in the overall CPI. As an example, in January 2023, the contribution of CPI-Services and CPI-Goods stood at 1.2 and 5.2 respectively in the overall headline inflation of 6.4 percent (1.2 + 5.2).

Figure 3: Contribution: CPI-Services and CPI-Goods



What drove goods and services inflation during the financial year 2022-23?

Table 3 shows the top contributors to goods and services inflation during the period April-January, 2022-2023. The table also shows the items that contributed negatively to the goods and services inflation respectively during this period (due to decline in prices or deflation). The key findings are outlined below:

- CPI Services recorded 5.2 percent Y-o-Y change during April-January 2023 as compared to the corresponding period of the previous year. During this period, the top contributors have been Rent (House / Garage), Tuition and other fees, Telephone charges, Bus/tram fare and Consultation fee for the doctor.
- Goods items contributed 5.7 percent to the headline inflation rate of 6.8 percent during Apr-Jan 2022-23 - implying a contribution of nearly 84%. Amongst the major contributors to the goods items are Milk, Wheat, Rice, Kerosene and Medicine, while the items which contributed negatively were mostly fruits and vegetables like Onion, Garlic, Apple etc. While milk prices rose by Rs. 8 in 2022 owing to higher feed cost, wheat prices saw a spike on account of shortfall in the production of crops on account of heat wave.

Table 3: Contribution by Items: Top and Bottom contributor by Goods and Services

Services					
Items	Weights	2021-22 (Apr-Jan)	2022-23 (Apr-Jan)	YoY Change	Contribution to headline CPI (Apr-Jan 2022-23)
Top Contributor					
House rent, garage rent (actual)	9.510	162.2	168.9	4.1	0.393
Tuition and other fees (school, college, etc.)	2.900	165.8	176.0	6.2	0.179
Telephone charges: mobile	1.840	146.7	156.8	6.8	0.126
Bus/tram fare	1.370	177.9	190.2	6.9	0.095
Doctor's/ surgeon's fee-first consultation (non-institutional)	0.790	187.9	198.4	5.6	0.044
Bottom Contributor					
Other conveyance expenses	0.010	172.0	189.2	10.0	0.001
Telephone charges: landline	0.170	116.4	117.2	0.7	0.001
Sweeper	0.040	178.7	184.3	3.1	0.001
Rickshaw (hand drawn & cycle) fare	0.050	176.4	181.6	2.9	0.001
Watch man charges (other cons taxes)	0.110	158.9	161.2	1.5	0.002

Goods					
Items	Weights	2021-22 (Apr-Jan)	2022-23 (Apr-Jan)	YoY Change	Contribution to headline CPI (Apr-Jan 2022-23)
Top Contributor					
Milk: liquid (litre)	6.420	158.0	169.1	7.0	0.451
Wheat/ atta - other sources	2.560	150.3	174.2	15.9	0.408
Rice - other sources	4.380	148.8	159.5	7.2	0.316
Kerosene - PDS (litre)	0.340	264.8	470.6	77.7	0.264
Medicine (non-institutional)	4.010	164.0	174.2	6.2	0.249
Bottom Contributor					
Onion	0.640	230.0	186.9	-18.7	-0.120
Garlic (gm)	0.310	179.3	129.0	-28.1	-0.087
Apple	0.470	136.9	126.3	-7.7	-0.036
Coconut oil	0.080	262.9	218.9	-16.7	-0.013
Coconut (no.)	0.260	227.3	217.6	-4.3	-0.011

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