India's recent inflation experience: drivers and policy responses

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1. Introduction

With 55 per cent of its consumer price index (CPI) comprising food and energy and being a net commodity importer, India was engulfed in the global upsurge in inflation that took hold during the pandemic and was exacerbated by the war in Ukraine. This turned out to be a regime shift in India's recent inflation history. In the four years prior to the onset of the pandemic, ie from 2016, India had adopted a flexible inflation targeting framework after putting in place the necessary pre-conditions. During October 2016 to March 2020, CPI headline inflation had averaged 3.9% and was closely aligned with the target of 4 +/- 2%.

2. Drivers of the inflation surge

With a strict lockdown in response to the first wave of the pandemic in March 2020, coupled with a massive urban to rural migration fleeing from the virus, overlapping supply shocks in the form of goods and labour shortages, supply chain and logistics bottlenecks, and spillovers from spikes in international food prices (especially edible oils) pushed inflation above the upper tolerance band of 6% right up to November 2020.

Monetary and fiscal stimuli, the ensuing easing of financial conditions and the usual seasonal softening of food prices in the winter did combine to bring down inflation to 4.8% during December 2020-March 2021. This turned out to be short-lived, however, as a devastating second wave of infections aggravated domestic supply chain and logistics disruptions once again even as retail margins were raised by local suppliers in a bid to recoup lost incomes. Inflationary pressures flared up in May-June 2021 and were intensified by spillovers from hardening international commodity prices, especially of crude petroleum and edible oil. At this time, the release of pent-up demand and its rotation away from contact-intensive services to goods collided with severe supply chain pressures, container shortages and surges in shipping costs across the world. Accordingly, as imported inflation became elevated and tenacious, core inflation pressures broadened in India and became persistent.

In early 2022, signs of moderation in inflation pressures were becoming evident as supply chains normalised gradually, contact-intensive services regained traction and infections ebbed as a massive national vaccination drive was undertaken. These

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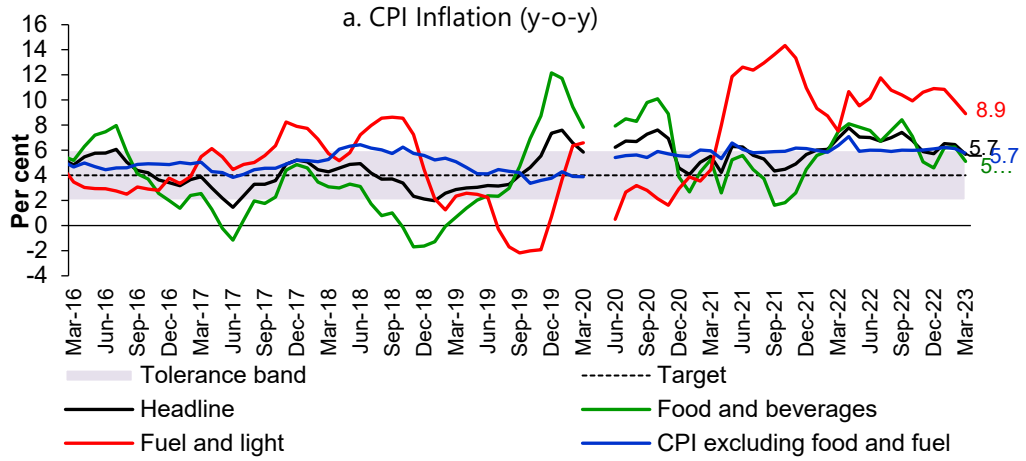
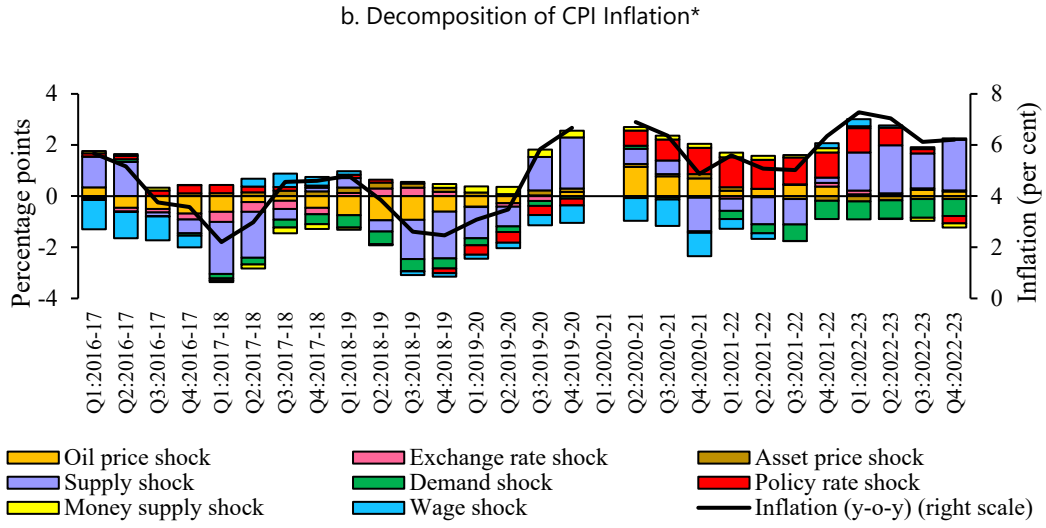
developments were, however, overwhelmed by the war in Ukraine in February 2022. The initial shocks took the form of global food and fuel prices – international food prices scaled a historic high in March, and Brent crossed US$ 100 per barrel in the same month. Sporadic domestic weather events such as heat waves and unseasonal rains also worsened inflation conditions (Graph 1 a and b).

CPI inflation drivers — Graph 1



Note:The imputed CPI prints for April and May 2020 are regarded as a break in the CPI series.



* Deviation from deterministic trend.

Note: Estimated using a vector autoregression over the sample period (Q4:2010-11 to Q4:2022-23). The VAR can be written in reduced form as: $Y_t = c + A\ Y_{t-1} + e_t$; where e_t represents a vector of shocks. Using Wold decomposition, Y_t can be represented as a function of its deterministic trend and sum of all the shocks e_t.

What started as multiple food and energy price shocks started getting generalised in the ensuing months as aggregate demand recovered and spending on services – especially recreation, hospitality and travel – resumed. Firms regained pricing power and input costs got increasingly passed on to retail prices. With

headline inflation remaining above the upper tolerance band for three consecutive quarters (Q1, Q2 and Q3 of 2021) accountability procedures mandated in legislation were triggered. The Reserve Bank of India submitted a report to the Government of India in November 2022 explaining the reasons for the persistent deviation of inflation from the target, the actions contemplated to return it to target and the time frame over which this was expected to happen.

Based on the influential work on a two-regime view of inflation with focus on transitions (Borio et al (2023)), an analysis of the properties of inflation regimes in India using a Markov switching model, suggest that since the fourth quarter of 2022, there is a rising probability of the Indian economy transiting away from the high inflation regime. Absent unfavourable idiosyncratic shocks, conditions are right for the early signs of grudging disinflation to firm up into a central tendency. Inflation persistence and trend are on the decline, indicating that inflation expectations are slowly getting re-anchored as monetary policy actions – an effective increase of 290 basis points in the policy rate, supported by the withdrawal of liquidity – and stance gain traction and aggregate demand is getting restrained. Individual sub-groups in the CPI are exhibiting higher volatility – sporadic supply shocks are still at work – but, importantly, covariance is declining. This suggests that generalisation of inflationary pressures is on the ebb. Increasingly localised price movements are influencing headline inflation. This calls for fine-tuning measures to align demand and supply of specific goods and services, which lies outside the realm of monetary policy but are being undertaken on an ongoing basis to head off potential price pressures from spreading. Additional evidence is found in the decline in the month-on-month momentum of core inflation, reinforcing empirical support that a low inflation regime may be setting in and that headline inflation will converge to its core. As demand pull is increasingly gaining traction, however, monetary policy has to remain in readiness to act pre-emptively to ensure that the disinflation that is underway is not interrupted till inflation aligns with the target of 4% (Patra et al (2023)).

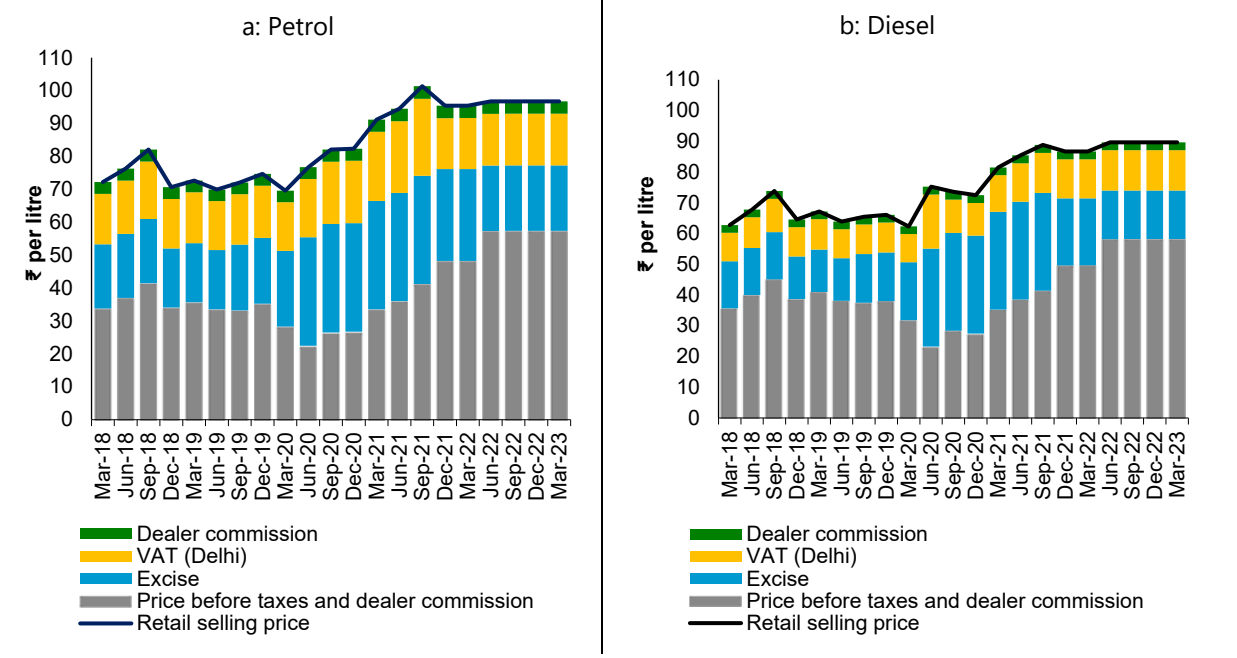
3. Supply side measures

India imports around 85% of its crude oil requirements and domestic pump prices are benchmarked to international prices. Fuel (including petrol and diesel) constitutes around 9% of the CPI and, in addition to direct effects on headline inflation, indirect effects are transmitted through transportation costs to product prices. At the start of the pandemic in 2020, fiscal measures in the form of higher taxes on domestic pump prices were announced to fund pandemic related expenditures. In 2021, however, as international commodity prices rose sharply, excise duties on petrol and diesel were reduced by 15% and 32%, respectively, in November. The spike in energy prices since the start of the conflict in Europe in February 2022 brought in its train a direct impact on domestic headline inflation as well as second-round pressures. In order to shield the economy from this geopolitically induced shock, excise duties on petroleum products were further reduced by 28% in May 2022 (leading to a cumulative excise duty reduction of 40% and 50% for petrol and diesel, respectively, since November

2021)[2] along with a freeze on domestic energy prices and a one-time grant to oil marketing companies to compensate for their losses (Graph 2).

Price build-up of petroleum products

Graph 2



Note: Price build-up based on Indian Oil Corporation Limited pump prices for Delhi.

Sources: IOCL; and PPAC.

Import taxes on pulses, edible oils, vegetables, plastic products, steel, cotton, rough diamonds, gemstones, chemical products and key industrial inputs were reduced to mitigate cost-push pressures. Fiscal outlays on spending on food and fertiliser subsidies were increased to keep input costs for farm production under check. Assured access to essential food items at subsidised prices to all poor, needy and vulnerable households covering around two-thirds of India's population was provided. Cereal and sugar exports were temporarily suspended in order to augment domestic supply. Stocking limits on edible oils and oilseeds were extended.

On the whole, analysis based on historical pass-through estimates indicates that between 2021 and Q2 2022 (when international energy prices peaked), the cumulative excise duty reductions and price freeze on domestic petrol and diesel translated to lowering headline CPI inflation by around 50 basis points. In addition, the lower pass-through of international LPG prices resulted in a reduction in CPI inflation by around 20 basis points.

[2] Excise duty on petrol was reduced by INR5 per litre and on diesel by INR10 per litre on November 4, 2021. It was further reduced by INR8 per litre for petrol and INR6 per litre for diesel on May 22, 2022, leading to a cumulative reduction in excise duty on petrol and diesel by INR13 per litre and INR16 per litre, respectively. With these two rounds of reductions, the excise duties of petrol and diesel were reversed to pre-pandemic levels.

4. Labour markets and inflation dynamics

In India, the large size of the informal sector in employment and the existence of disguised employment in agriculture makes the assessment of structural characteristics of the labour market challenging.[3] Cyclical features of labour market dynamics are gauged on the basis of official and private surveys covering rural and urban areas.[4] In addition, job flows in the organised sector are assessed on the basis of social security contributions.[5] Information on wages is gleaned from official surveys of rural wages,[6] while for the organised sector, it is extracted from staff costs in financial results of listed companies. Information on vacancies/hiring is obtained from open online sources. Sentiments on labour market conditions and outlook are collected from surveys of consumer confidence and enterprise perceptions.

These indicators suggest that the unemployment rate has eased below its pre-pandemic level, while the labour force participation rate is still lagging. New hiring in the organised sector has crossed pre-pandemic levels. The demand for employment at the government guaranteed minimum wage had risen strongly during the pandemic; since July 2022, however, it has fallen but remains above pre-pandemic levels, indicating that employment opportunities are being gradually restored on farms as well as allied activities. Vacancies in the organised sector, especially in real estate, hospitality, chemicals, pharmaceuticals, biotech and gems and jewellery are above pre-pandemic levels. Forward-looking surveys suggest that consumers' perceptions about the employment situation have improved but they are still in the pessimistic zone. One year ahead expectations are optimistic but lower than the pre-war period. Enterprises in manufacturing, services and infrastructure sectors are optimistic about future employment prospects.

Both nominal and real rural wages declined sharply during the first wave of the pandemic. Real wages have remained flat since then, posing a downside to private consumption demand (Graph 3).

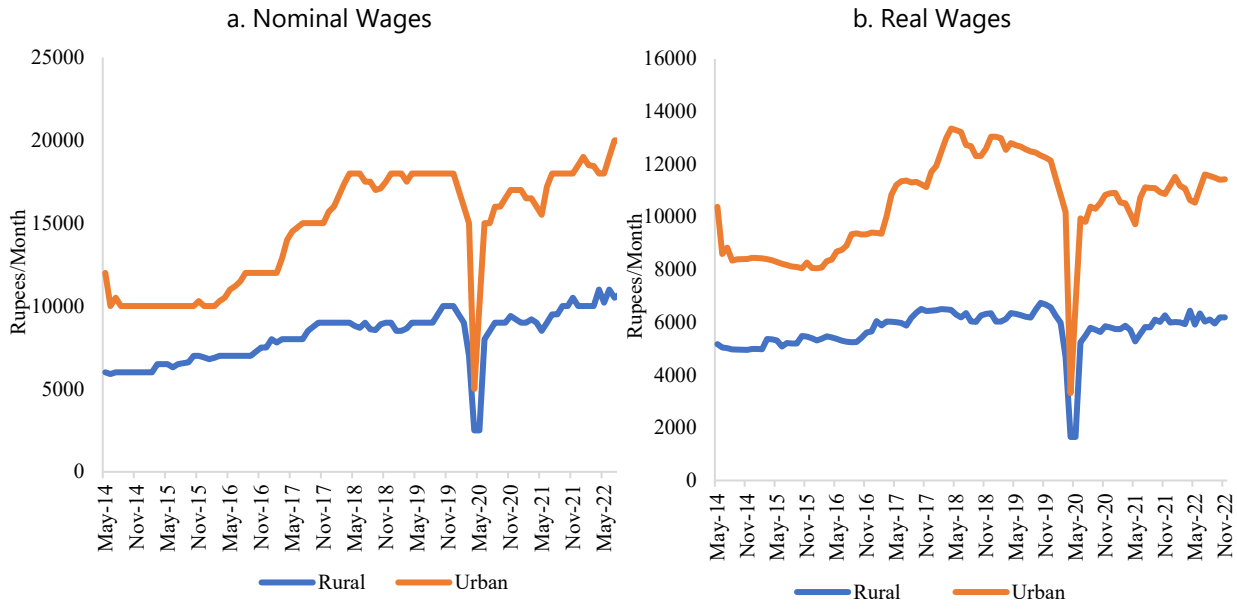
[3] An Annual Survey of Industries (ASI) provides estimates of employment, man-days employed and emoluments paid in the factory sector for each 2-digit/3-digit industry group (NIC-2008) for each State/UT and for each 4-digit industry group at the all-India level. While these data can be used for understanding the structural characteristics of the labour market, the lag in their availability of up to 2 years makes them less relevant for monetary policy formulation.

[4] The Periodic Labour Force Survey (PLFS), published by National Sample Survey Office (NSSO) since April 2017, consists of two components: (i) employment and unemployment indicators for both rural and urban areas annually (July-June period) and (ii) quarterly employment and unemployment indicators for the urban areas. The Centre for Monitoring Indian Economy's (CMIE) survey-based data for employment situation for both rural and urban areas on a weekly basis are analysed.

[5] In the organised sector, data from Employees' Provident Fund Organisation (EPFO), Employees' State Insurance Corporation (ESIC) and National Pension System (NPS) scheme are analysed to track the change in net subscribers over a given period.

[6] The Labour Bureau, Government of India provides information on daily wage rates in agricultural and non-agricultural occupations.

Nominal and real wages Graph 3



Source: CMIE.

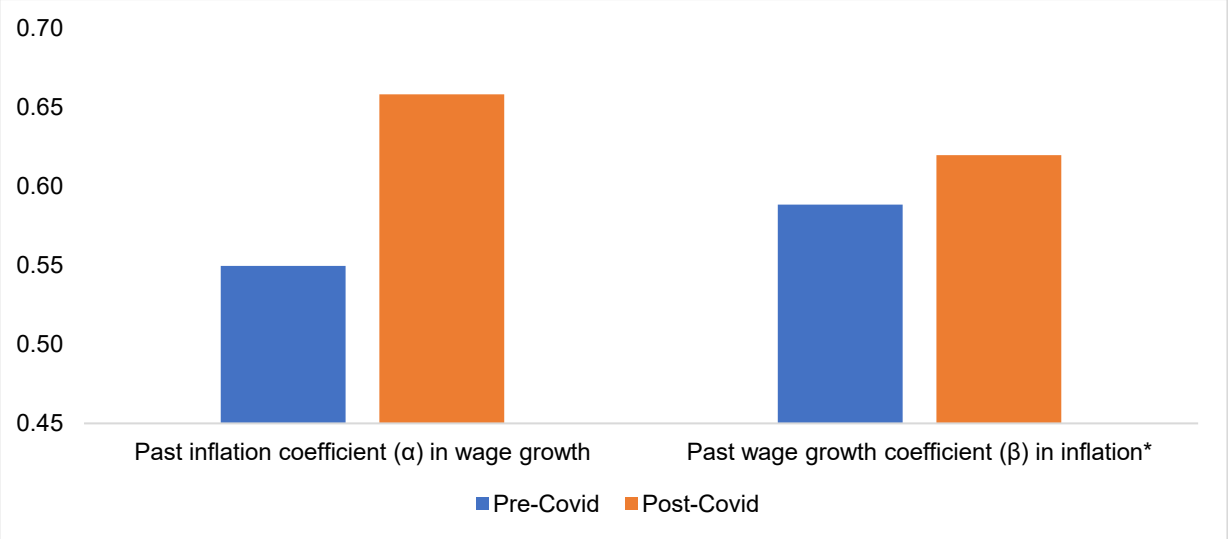
For the organised corporate sector, the results of a vector error correction model suggest that there is one-way long-run causality from the per employee staff costs to urban consumer prices, with long-run coefficient below unity indicating no wage-price spiral (Graph 4).[7] On the other hand, there is a bi-directional convergence between rural wage growth rate and rural consumer price inflation, with a stronger impact from inflation to wages than from wages to inflation, suggesting that a rural wage-price spiral may develop if high inflation persists.[8] This is backed by empirical estimates which suggest that changes in rural prices have a positive and significant impact on changes in nominal agricultural wages, but the latter do not adjust completely to changes in prices (Kundu (2019); RBI (2022)). The impact of growth in wage income of households on inflation has marginally increased in the post-COVID period, though it remains less than one for one to cause any wage-price spiral.

[7] Manufacturing:
$\Delta cpi_t = -0.05^{**}(cpi_t - 0.75^{***}wage_t - 2.03) + 0.28^{*}\,\Delta cpi_{t-1} - 0.07^{***}\,\Delta wage_{t-1} + 0.01$
$\Delta wage_t = 0.17(cpi_t - 0.75^{***}wage_t - 2.03) + 0.52\Delta cpi_{t-1} - 0.22\Delta wage_{t-1} + 0.01$
Services:
$\Delta cpi_t = -0.08^{***}(cpi_t - 0.49^{***}cpi_t - 3.06) + 0.08\Delta cpi_{t-1} - 0.14\Delta cpi_{t-2} - 0.06^{**}\Delta wage_{t-1} + 0.02\Delta wage_{t-2} + 0.02$
$\Delta wage_t = 0.02(cpi_t - 0.49^{***}wage_t - 3.06) + 0.30\Delta cpi_{t-1} - 1.62^{*}\Delta cpi_{t-2} + 0.04\Delta wage_{t-1} + 0.38^{***}\Delta wage_{t-2} + 0.03]$

[8] $\Delta w = -0.1^{***}(w_t - 0.97^{***}p_t - 0.44) + 0.21^{*}\,\Delta w_{t-1} - 1.00$
$\Delta p_t = -0.06^{**}(w_t - 0.97^{***}p_t - 0.44) + 2.23$
*, **, ***, refers to significance at 10 per cent, 5 per cent, 1 per cent levels, respectively.

Wage-price relationship

Graph 4



Note: Estimations are based on following two equations:

〖inflation〗_(t+6)=μ+α〖wage growth〗_t+ γ 〖unemployment gap〗_

〖wage growth〗_(t+6)=ω+β〖inflation〗_t+ φ 〖unemployment gap〗_t

*: Statistically not significant at 10 per cent level.

Source: RBI Staff estimates based CMIE Consumer Pyramid Data.t

In the organised manufacturing sector, there is little evidence of household inflation expectations leading to higher wages, which may be reflecting weakening bargaining power of labour because of factors such as globalisation and cheaper imports, automation, monopsony power of employers due to concentration of production in large firms and weakening unionisation. In the services sector, however, there is some evidence of inflation expectations exerting pressure on wages (Pattanaik et al (2020)).

Cyclical influences in the labour market such as slack or tightness are measured by the unemployment gap (actual unemployment rate minus its trend). When the unemployment gap is used as a proxy for marginal cost in a new Keynesian hybrid Phillips curve framework to analyse the trade-off between inflation and unemployment and to forecast inflation, the Phillips curve is steeper (coefficient is 0.2) relative to when the output gap is used (coefficient is 0.07),[9] validating the empirical regularity enshrined in Okun's Law[10] (Graph 5). A unit increase in the unemployment gap (ie unemployment rate relative to trend) lowers inflation by around 20 basis points. The unemployment gap had increased to 3% during the pandemic in the third quarter of 2020 from almost zero in the fourth quarter of 2019,

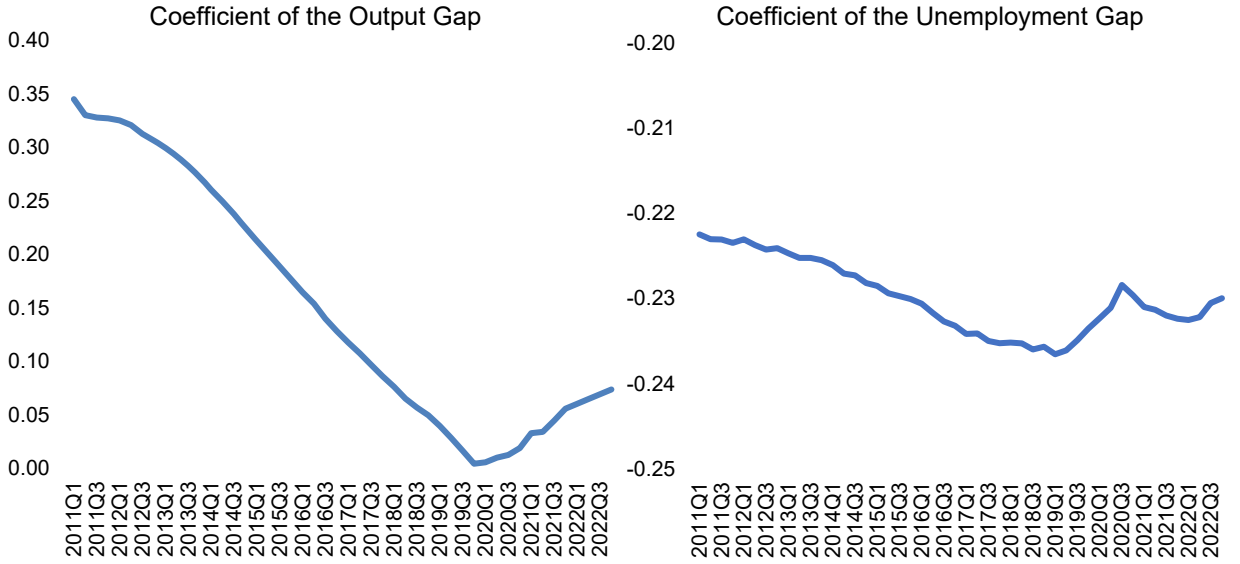
[9] Patra et al (2021) found that the slope of the Phillips curve in India flattened from 2011 to the first half of 2020. From the second half of 2020, it has started steepening. The responsiveness of inflation to the output gap rises when the gap is positive.

[10] The relationship between unemployment and output – a 1% increase in unemployment will usually be associated with a 2% drop in GDP in India.

reflecting extreme slack in the labour market as people dropped out of employment to escape infection/lockdown. The unemployment gap has turned negative since the second quarter of 2021 as migrant labourers returned to workplaces and a rebound in contact-intensive services took hold.

Time-varying slope of the Phillips curve

Graph 5



Source: RBI Staff estimates.

5. Conclusion

The experience with the recent elevation in inflation in India and across the world has been a defining one. The question confronting policy makers is: is it behind us and will inflation make its tryst with its target over the next two years? Or, have the structural characteristics of inflation information changed? The dynamics observed since the pandemic and the war have formed under high uncertainty and are, therefore, potentially vulnerable to shifts. Hence, they need to be regularly updated with new information and better-quality surveys. Both are work in progress.

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