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Inflation Persistence and Expectations: Pakistan's Post-COVID-19 Inflationary Episode

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Abstract

We posit that post-COVID-19 inflation persistence was at an elevated level due to high inflation expectations having morphed into a self-fulfilling prophecy amid cost shocks and policy uncertainty despite the slack in economic activity. We estimate a hybrid New Keynesian Phillips Curve for Pakistan and find a significant and positive pass-through of near-term inflation expectations on actual inflation. Specifying a threshold, the inflation expectations' explanatory power is further established as it is found to be three times greater in high-inflation periods than in low-inflation ones. Another unique result for a developing country like Pakistan is that both forward- and backward-looking expectations carry nearly equal impact in baseline estimates. Thus, our findings underscore the need for an effective anchoring of inflation expectations in Pakistan.

Introduction

The post-COVID-19 inflationary surge in Pakistan climbed to a multi-decade high level in FY 2023 and FY 2024 (Figures 1 and 2).[4] Initially, pent-up demand in a favorable monetary and fiscal policy environment, along with a global commodity price super cycle, pulled national consumer price index (NCPI) inflation into double digits. The fallout of the Russia-Ukraine war and supply-side disruptions from the 2022 monsoon floods in Pakistan further intensified

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[4] FY or the 'financial year' begins on 1 July and ends on 30 June the following year, e.g., FY 2023 = financial year 2022–2023.

inflationary pressures. The second-round effects of higher food and energy prices and sizeable exchange rate depreciation also spilled into general prices.

The response to this inflationary surge began with the State Bank of Pakistan (SBP)'s contractionary monetary policy and macro-prudential measures in autumn 2022; fiscal policy was complemented with a wide range of tightening measures. These demand management policies arrested the pace of economic activity. The real gross domestic product (GDP) contracted by 0.21 percent in FY 2023 and grew only modestly (2.4 percent) in FY 2024, mainly due to agricultural output expansion. High-frequency domestic demand indicators remained largely compressed in both years.

However, despite this slack in overall economic activity, inflation did not plateau; instead, it remained at elevated levels in FY 2023 and FY 2024. We argue that this rigidity in inflation was due to inflation expectations, which, amid cost shocks in an environment of policy uncertainty, morphed into a self-fulfilling prophecy.

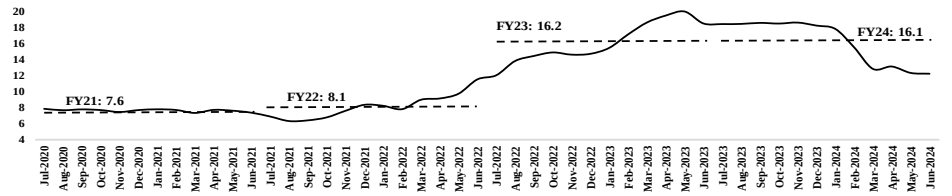
We formalize our hypothesis using a hybrid New Keynesian Phillips Curve (NKPC) in which near-term inflation expectations are established as a determinant of actual inflation in Pakistan. Estimates of the hybrid NKPC confirm that near-term inflation expectations (referred to as 'inflation expectations' going forward) have a positive and statistically significant impact on actual inflation.[5] Backward-looking expectations are also important in determining actual inflation in the estimates as they are also statistically significant.

Figure 1: NCPI inflation percentage (year-on-year), July 2020–June 2024

Source: Pakistan Bureau of Statistics (PBS).

[5] Near-term inflation expectations here are six-month-ahead inflation expectations. Refer to the Consumer Confidence Survey conducted by the Institute of Business Administration and the SBP.

Figure 2: Non-food, non-energy (core) inflation: Urban percentage (year-on-year), July 2020–June 2024



Source: PBS.

Our findings are further strengthened by analyzing the explanatory power of inflation expectations in a threshold regression with high- and low-inflation regimes. The pass-through estimates demonstrate that inflation expectations amplify current inflation three times as much in high-inflation regimes as in low-inflation regimes. This implies that prevailing conditions (e.g., high inflation, a matter for economic agents' expectations formation) are important drivers of inflation dynamics in Pakistan.

Another highlight of the estimation results is that both backward- and forward-looking expectations carry nearly equal impact in determining actual inflation in baseline estimates. This is a relatively unique result for a developing country like Pakistan since the share of backward-looking expectations tends to be larger than that of forward-looking ones in most developing countries.[6] Overall, our findings underscore the need for an effective anchoring of inflation expectations in Pakistan.

The study proceeds as follows. The next section is an empirical investigation that presents chronological facts about the demand- and supply-side sources of Pakistan's post-COVID-19 inflationary surge. Importantly, it establishes the theoretical link between inflation and inflation expectations, describing and justifying the conventional and subtle determinants of the formation of inflation expectations. We go on to present empirical evidence of the relationship between inflation and inflation expectations (using Pakistani data) through the estimates of a hybrid NKPC model. In doing so, we justify the adoption of a formal monetary policy regime to better anchor inflation expectations in Pakistan.

[6] Albrizio et al. (2023, p. 49). This also implies weak monetary policy.

The Chronology of the Post-COVID-19 Inflationary Surge and the Link between Inflation and Inflation Expectations

The inflationary surge is mapped through the following shocks: pent-up demand, the Russia-Ukraine war, and the 2022 monsoon floods.

Pent-up Demand

The lag effect of domestic monetary and fiscal policies to counter the adverse impact of the pandemic's multiple waves was instrumental in facilitating pent-up demand after the lifting of lockdowns in late 2020. The SBP provided generous policy support, and the government rolled out sizable stimulus packages.[7] A strong inflow of worker remittances further pushed household incomes.[8] Hence, the combined effect of policy support and pent-up demand accelerated the country's GDP growth to around six percent during FY 2021 and FY 2022, driving inflationary pressures in the economy. At the same time, a rebound in global economic growth, also due to pent-up demand, widened global supply-demand imbalances, leading to a global commodity price super cycle. Concurrently, rising global trade volumes, alongside new COVID variants (Delta and Omicron) obstructed distribution networks and increased freight costs.

The Russia-Ukraine War

The commodity price super cycle was already a global challenge. The Russia-Ukraine war further aggravated price pressures from February 2022 onward, prompting advanced and emerging economies to tighten their monetary policies. The resultant stringency in financial conditions impeded global foreign exchange flows. At the same time, the rising US dollar and Pakistan's worsening current account deficit weakened the rupee considerably in FY 2022, especially in its fourth quarter.[9] Rupee depreciation also translated into higher domestic food and energy prices. In addition, the uptrend in inflation was further augmented by perishable

[7] In addition to a 625-basis points reduction in the policy rate, the SBP provided a temporary economic refinance facility to aid new investments, refinance healthcare schemes, support the Rozgar scheme to prevent layoffs, finance a loan extension and restructuring package to ease borrowers' cash constraints. In the same vein, the government rolled out Ehsaas emergency cash transfers, offered a comprehensive agricultural sector package, accelerated tax refunds for export-oriented sectors, eliminated import duties on healthcare equipment, and provided utility bill relief; its stimulus amounted to PKR 1.2 trillion. The government also announced a construction package, while the SBP implemented mandatory construction financing targets for banks. Importantly, Pakistan's emergency cash intervention was ranked fourth in terms of the number of people covered, and third in terms of the share of population (source: Poverty Alleviation and Social Safety Division).

[8] Workers' remittances averaged around USD 2 billion per month during FY 2020–FY 2022.

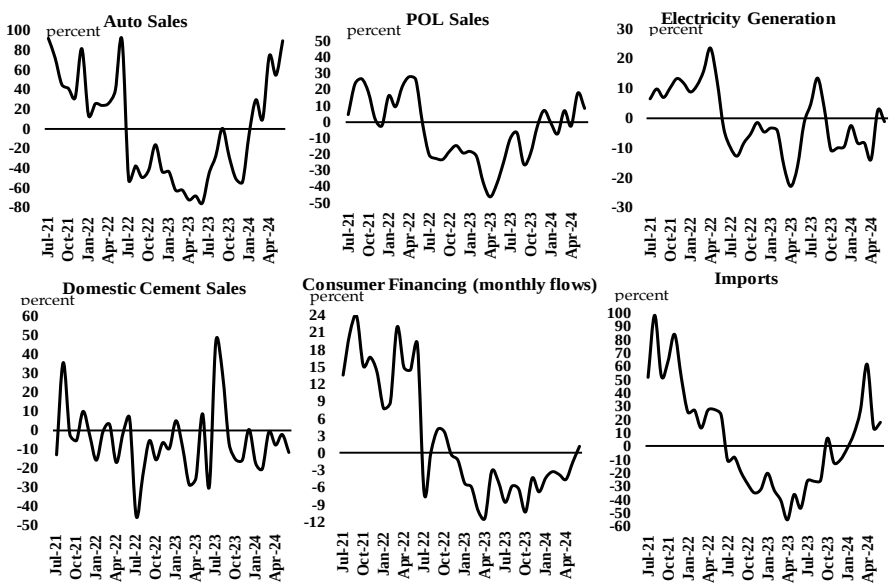
[9] The rupee depreciated by 13.2 percent during February–June FY 2022, compared to 11.2 percent during July–February FY 2022.

commodity shortages, an increase in tax rates under the Supplementary Finance Act, and an upsurge in power tariffs under the circular debt management plan.

2022 Monsoon Floods

Heavy rainfall and associated floods gave rise to supply shortages as food inflation rose by 37.6 percent in FY 2023 in urban areas, compared to 13.4 percent in FY 2022. Inflation in fresh milk more than doubled in both urban and rural areas and had the largest contribution to overall inflation in FY 2023.[10] The flash floods also caused significant damage to the livestock population,[11] causing upward pressure on the prices of milk, chicken, and meat. Delays in the drainage of standing water in agricultural fields cast doubts about the prospects of the timely plantation of the FY 2023 wheat crop, adding further impetus to the price uptrend. Amid flood-induced damage, perishable food items witnessed a sharp increase in inflation as well.

Figure 3: High-frequency demand indicators: Year-on-year growth (July 2021–April 2024)



Sources: Oil Companies Advisory Council, Pakistan Automotive Manufacturers Association, All Pakistan Cement Manufacturers Association, National Electric Power Regulatory Authority, SBP, and PBS.

[10] The contribution of milk and wheat stood at 2.1 and 2.2 percentage points, respectively, during FY 2023 in urban CPI inflation. In rural areas, wheat and milk contributed 3 and 4.4 percentage points to inflation, respectively, in FY 2023 (source: PBS).

[11] Around one million heads of livestock perished (source: Government of Pakistan, 2022, p. 17).

The Link Between Inflation and Inflation Expectations

The chronology above shows that both aggregate demand and cost shocks created inflationary momentum in Pakistan's economy. To counter this, the SBP and government implemented a host of demand-compression measures starting from the autumn of 2022.[12] As a result, all major high-frequency domestic demand indicators, including the sales of automobiles, cement, and petroleum products, showed a considerable decline; imports plummeted, consumer financing shrank, and growth in electricity generation remained negative (Figure 2). Compared to nearly 6 percent growth in both FY 2021 and FY 2022, real GDP growth declined by 0.21 percent in FY 2023 and grew only moderately by 2.4 percent in FY 2024.[13] However, despite this slack in economic activity, inflation rose and persisted in both FY 2023 and FY 2024 (Figure 1); rigidity in the core component was especially noteworthy (Figure 2).

We attribute this intractable behavior of inflation to elevated, and somewhat entrenched, inflationary expectations. As the theory posits, in cases of higher future inflation expectations, both producers and consumers try to stay ahead of rising costs by setting higher prices and demanding higher wages, respectively.[14] Such behavior transforms into a self-fulfilling prophecy: expectations of higher inflation cause higher inflation. The commonly cited factor forming these expectations is economic shocks stemming from aggregate demand, commodity markets, or the foreign exchange rate, which then affect trend inflation.[15]

While the earlier rise in pent-up demand in Pakistan was a driver of inflation expectations, the role of the aforementioned supply-side developments should also be noted.

[12] Specifically, the SBP undertook the following measures: (i) raising the policy rate by a cumulative 1,500 basis points during FY 2022 and FY 2023, (ii) tightening macro-prudential measures for auto and consumer financing in September 2021 and May 2022, (iii) increasing the cash reserve requirement for commercial banks in November 2021, (iv) imposing a 100 percent cash margin requirement on a number of import items in April 2022, and (v) issuing a prior approval list for a number of import items in December 2022. The government complemented these measures by: (i) increasing the federal excise duty on locally assembled cars, (ii) eliminating various tax exemptions under the Supplementary Finance Act in FY 2022 and FY 2023, (iii) imposing a ban on the import of non-essential items, (iv) temporarily halting fresh disbursements under the Mera Pakistan Mera Ghar and Kamyab Jawan Youth Entrepreneurship loan schemes, and (v) gradually rolling back its fiscal package.

[13] GDP growth in 2024 was mainly due to better crop production as the impact of contractionary policies continued, with large-scale manufacturing growing only marginally and overall industrial activity contracting.

[14] For inflation expectations as a central driver of inflation dynamics, see D'Acunto et al. (2023), Werning (2022), Clark and Davig (2009), Mishkin (2007), and Bernanke et al. (2001).

[15] Mishkin (2007). Some studies also account for similar determinants of inflation expectations, e.g., Moessner (2022) for the Euro area, Patra and Ray (2010) for India, Mehra and Reilly (2008) for the US, and Cerisola and Gelos (2005) for Brazil.

First, the 2022 monsoon floods dented expectations of a better wheat crop in FY 2023, apart from causing supply shortages in the food market. In addition, there was a lingering adverse impact of the Russia-Ukraine war on global commodity prices and the rupee exchange rate.

Second, the rupee continued to depreciate substantially since the second half of FY 2022 despite a sharp contraction in the current account deficit. This occurred against the backdrop of uncertainty surrounding the resumption of International Monetary Fund (IMF) program reviews and ensuing constrained foreign exchange inflows.[16] Overall, the rupee depreciated by 28.2 percent in FY 2023, compared to 9.9 percent in FY 2022.

Third, temporary import restrictions in FY 2022, including bans on certain items, raised concerns about the continued domestic supply of various commodities, which further stoked inflationary expectations.

Another subtle contributor to the formation of higher inflation expectations in FY 2022 and FY 2023 was the general uncertainty stemming from adverse political developments. In effect, political noise created policy uncertainty for the markets as it signaled the government's diminished ability to manage unfavorable shocks and its implementation of consistent or coherent policies, such as the much-delayed IMF stabilization program.[17]

Inflation Expectations and Actual Inflation: The Evidence

We apply a hybrid NKPC model to assess whether the relationship between inflation expectations and actual inflation in Pakistan holds in the causality sense. The widely used NKPC model describes past inflation, inflation expectations, and a measure of aggregate demand as the main drivers of current inflation. Thus, in determining inflation in Pakistan, we follow Gali and Gertler (1999) and consider a hybrid NKPC model to quantify the role of inflation expectations in influencing actual inflation:

$$\pi_t = \alpha + \beta^{\mathrm{f}} * \mathrm{E_t}(\pi^e_{t+1}) + \beta^{\mathrm{b}} * \pi_{t-1} + \Theta * Gap_t + \epsilon_t \quad (1)$$

π_t, π_{t-1}, and $\mathrm{E_t}(\pi^e_{t+1})$ are current inflation, lagged inflation, and inflation expectations, respectively. Inflation data (NCPI) is taken from the PBS. Inflation expectations here are six-month-ahead inflation expectations taken from the

[16] Pakistan entered a three-year extended fund facility program with the IMF in 2019.

[17] Empirically, the nexus between political instability and inflation is well established, e.g., Aisen and Veiga (2006) and Khan and Saqib (2011).

Consumer Confidence Survey conducted by the Institute of Business Administration and the SBP. Gap_t is the output gap, which is a cyclical series of the Hodrick-Prescott filter applied to the industrial production index of the large-scale manufacturing sector (from the PBS).[18] The estimation sample is two-monthly data from January 2012 to September 2023.

Using the same set-up, we further check if the pass-through of inflation expectations to actual inflation is high during high-inflation periods and low in low-inflation ones. Investigating this facilitates an understanding of the explanatory power of inflation expectations.

Therefore, with the objective of assessing the explanatory power of inflation expectations in a high-versus-low inflation environment, we specify a threshold regression as follows:

$$\pi_t = \alpha + \beta^{f^H} \times \mathrm{E_t}(\pi^e_{t+1}) \times \mathrm{D^h} + \beta^{f^L} \times \mathrm{E_t}(\pi^e_{t+1}) \times (1 - \mathrm{D^h}) + \beta^{b} \times \pi_{t-1} + \Theta \times Gap_t + \epsilon_t \quad (2)$$

where,

$\mathrm{D^h} = \begin{Bmatrix} = 1 \; if \; \pi_t > \overline{\pi_t} \\ = 0 \; if \; \pi_t \leq \overline{\pi_t} \end{Bmatrix}$; where $\overline{\pi_t}$ is sample average inflation.

The estimates for Equations 1 and 2 are presented in Table 1. The coefficients have priori signs, are statistically significant, and pass all the diagnostics. The diagnostics indicate that there is no endogeneity-induced inconsistency or missing variable bias in the estimates.

The estimates in Equation 1 represent the impact of inflation expectations, our variable of prime concern, on current inflation. The results are in line with our theoretical predictions and empirical literature on NKPC. A one-percentage-point increase in inflation expectations raises current inflation by 0.14 percentage points. Thus, this establishes that inflation expectations are a determinant of actual inflation in Pakistan.

Furthermore, the significance of the coefficient of past inflation outturns (lagged NCPI) indicates that firms, when setting prices, and consumers, when

[18] Gali and Gertler (1999) emphasize the importance of using direct measures of real marginal cost, such as labor income share. However, we use the output gap (which has been widely used in NKPC literature) because of a lack of availability of such firms' marginal cost data. In another estimation of NKPC for Pakistan, Hyder and Hall (2020) use other approximations of sector-wise marginal costs. However, their approach is beyond the scope of this study.

demanding wages, take past realizations of inflation into account. In particular, a one-percentage-point increase in inflation expectations raises current inflation by 0.13 percentage points. This result adds to the findings on inflation expectations above, accentuating the persistence aspect of actual inflation.

Table 1: Estimates of Equations 1 and 2 (January 2012–September 2023)

Dependent variable	**NCPI Equation 1**	**NCPI Equation 2**
Constant	0.09	0.11
	(0.54)	(0.62)
Inflation expectations	0.14[a]	-
	(0.001)*	
Inflation expectations (high-inflation regime)[b]	-	0.27[a]
		(0.00)*
Inflation expectations (low-inflation regime)[b]	-	0.01[a]
		(0.001)*
Output gap	0.02[c]	0.02[c]
	(0.10)***	(0.13)
Lagged NCPI	0.13	0.12
	(0.10)***	(0.10)***
Trend	0.01	0.01
	(0.002)*	(0.002)*
R^2	0.26	0.28
F-stat	11.86	10.60
Durbin-Watson	2.01	2.06
Q_1	0.023	0.19
	[0.88]	[0.66]
Q_1^2	4.80	3.22
	[0.11]	[0.20]
Lagrange multiplier test (serial correlation)	0.010	0.83
	[0.90]	[0.44]
Durbin-Wu-Hausman test		
Difference in J-stats (inflation expectations)	0.03	0.53
	[0.86]	[0.46]
Difference in J-stats (output gap)	0.58	0.40
	[0.44]	[0.52]

Standard errors of coefficients are given in parentheses, and probabilities are given in square brackets.

[a] Short-run estimate. Long-run estimate = short-run estimate divided by one minus the lagged NCPI estimate.

[b] If $\pi_t > \overline{\pi_t}$, high-inflation regime. If $\pi_t \leq \overline{\pi_t}$, low-inflation regime. $\overline{\pi_t}$ = 10.1 percent in the January 2012–September 2023 sample.

[c] Estimated coefficients were divided by 100.

*, **, and *** indicate significance at one percent, five percent, and ten percent, respectively.

The coefficient for the measure of aggregate demand activity (output gap) is relatively smaller than the other determinants, implying its somewhat limited role in determining inflation in Pakistan. A relatively small coefficient of the output gap could also be due to the specification of the hybrid NKPC, since it is criticized for not incorporating the supply side (e.g., Batinia et al., 2005). In the same vein, Ho and McCauley (2003) suggest the significance of the exchange rate in the evolution of domestic inflation, which tends to be greater for emerging market economies than for developed economies. In addition, Sahu (2013) uses an open-economy model for India and finds that fuel inflation, the exchange rate, and foreign inflation are significant determinants of India's inflation (Hayashi et al., 2015, p. 5). Nonetheless, the lack of supply-side determinants does not undermine our estimated equations, as they pass all diagnostics.

Further analysis of the findings in Table 1 is captured in the estimates of Equation 2. In particular, we analyze whether the effect of inflation expectations on actual inflation changes with the prevailing level of inflation. The results for the interactive high- and low-inflation regimes reveal that inflation expectations have a higher and significant impact on current inflation in a high-inflation regime, while the impact is moderate in a low-inflation regime. In a high-inflation regime, if inflation expectations increase by one percentage point, inflation increases by 0.27 percentage points. In the case of a low-inflation regime, a one-percentage-point increase in inflation expectations increases inflation by 0.10 percentage points.

The results from Equation 2 underline the relevance of inflation expectations for economic agents. For example, as observed by Coibion et al. (2020), economic agents may reduce the information content of expectations when inflation is low and stable, but may become more attentive when inflation is high and volatile, thereby making expectations a major driver of actual inflation.[19] In our period of analysis, headline NCPI inflation averaged 17.4 percent during January 2020–December 2023, coinciding with the post-COVID-19 inflationary surge, as compared to only 6.3 percent during January 2012–December 2019.

These results also highlight the possibility of inflation expectations morphing into a self-fulfilling prophecy during high-inflation periods, which, in our sample, coincides with the post-COVID-19 inflationary surge. Therefore, despite a contractionary policy stance and ensuing drag in domestic demand and overall slack in economic activity, inflation's rigidity at a higher level has been due to

[19] This observation is reproduced from Albrizio et al. (2023, p. 50).

elevated and entrenched inflationary expectations, especially in the second half of FY 2023 and during the first quarter of FY 2024.

Another important interpretation of the results relates to the estimates of inflation expectations and lagged NCPI in Equation 1. We observe that the size of its estimated coefficient (0.13) is only marginally less than the estimate of inflation expectations (0.14). This implies that both forward- and backward-looking inflation expectations impact current inflation nearly equally. This finding is relatively unique because the weight of backward-looking agents is usually greater than that of forward-looking ones in a typical developing economy like Pakistan. As already noted, Albrizio et al. (2023, p. 49) observe that in most developing countries, the share of backward-looking expectations tends to be larger than that of forward-looking ones, which implies weak monetary policy since backward-looking agents tend to focus more on past outturns of inflation and less on forward-looking monetary policy actions. This is also corroborated by Dizioli and Wang (2023), who note that the inflation expectations of economic agents are based on the adaptive learning of available information, which produces inflation inertia.

Hence, this adaptive nature prolongs the time required for disinflation and increases its cost by weakening the effectiveness of monetary policy. Nonetheless, the significance of both forward-looking (especially in high-inflation periods) and backward-looking expectations highlights the need for improved and effective management of inflation expectations in Pakistan.

Concluding Remarks

Tracking the multi-decade high post-COVID-19 inflationary surge in Pakistan, we mapped its sources to demand- and supply-side factors, namely pent-up demand, the Russia-Ukraine war, and the 2022 monsoon floods. The demand management policy response to counter the inflationary surge induced a decline in several high-frequency domestic demand indicators and a visible slack in overall economic activity in FY 2023 and FY 2024. Despite this, inflation continued to climb higher and remained at an elevated level. In other words, even invoking a recession did not help induce disinflation. We attribute inflation's relatively rigid behavior to inflation expectations. In particular, amidst several cost shocks in an environment of uncertainty, inflation expectations morphed into a self-fulfilling prophecy, due to which inflation did not plateau.

As evidence, we applied a hybrid NKPC model and formalized inflation expectations as a determinant of actual inflation in Pakistan. Inflation expectations, as gauged by the Consumer Confidence Survey, have a positive and significant pass-through on actual inflation. Furthermore, the explanatory power of inflation expectations in a threshold-augmented estimate demonstrates that the pass-through of inflation expectations on actual inflation is three times as high in high-inflation periods as in low-inflation ones. This signifies the importance of prevailing circumstances in driving inflation dynamics in Pakistan.

What policy lessons can we draw from this post-COVID-19 inflationary surge in Pakistan? Indeed, we should introduce ways and means for an improved mechanism for the management of inflation expectations. In this regard, making monetary policy more effective in anchoring inflation expectations by adopting a formal framework, such as an inflation-targeting monetary policy regime, would be optimal. Several emerging economies have successfully anchored inflation expectations by adopting such a framework. Even in the post-COVID-19 inflationary surge, some inflation-targeting economies, such as India, have fared well in anchoring inflation expectations.[20]

[20] See, for example, Kose et al. (2019) for a review of the successful implementation of inflation-targeting monetary policy regimes in Brazil, Chile, and Poland. For India, see Eichengreen and Gupta (2024).

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