

Inflation Volatility and Economic Expansion in Emerging Economies: Evidence from the Global Recovery Phase**Dr. X. Naveenraj¹, Dr. Suresh Palarimath², Neha Rajput³, Bhgah Ibrahim Yusuf Adam⁴, Dr Saravanan V⁵**¹Assistant Professor, Business Administration, SRM Institute of Science and Technology, Chennai, Tamil Nadu, naveenraj.x@gmail.com²Lecturer, College of Computing and Information Sciences, University of Technology and Applied Sciences, Salalah, Dhofar
Salalah, Sultanate of Oman, suresh.palarimath@utas.edu.om³Assistant Professor, School of Management Studies, CGC University, Mohali, neha10rajput11@gmail.com⁴Assistant Professor, Jazan University, Public Health, College of Nursing and Health Sciences, Jazan, byusuf@jazanu.edu.sa⁵Professor & Head, Department of Aeronautical Engineering, Nehru Institute of Technology, Coimbatore, Tamil Nadu, saravana1712@gmail.com**Abstract**

Inflation volatility represents one of the most consequential macroeconomic challenges confronting emerging market economies during periods of external shock recovery, influencing investment decisions, monetary policy credibility, and long-run economic growth through complex, nonlinear transmission mechanisms that standard linear models inadequately capture. This paper investigates the dynamic relationship between inflation volatility and economic expansion across a panel of 42 emerging market economies during the global recovery phase spanning 2020–2024, a period characterized by unprecedented monetary stimulus, supply chain disruptions, commodity price shocks, and divergent monetary policy normalization trajectories that generated exceptional variation in inflation-growth dynamics across the emerging market universe. Employing a panel vector autoregression framework augmented with regime-switching specifications and threshold cointegration analysis, we document that inflation volatility exerts a statistically significant and economically meaningful negative effect on economic growth, but that this relationship is heterogeneous across income levels, monetary policy frameworks, financial development stages, and commodity export dependence. The evidence reveals a threshold inflation volatility level above which growth penalties are sharply amplified, consistent with theoretical models of irreversible investment under uncertainty. Inflation targeting frameworks are found to significantly attenuate the growth costs of inflation volatility, providing empirical support for the institutional view of monetary policy framework adoption. These findings carry important implications for macroeconomic policy design in the post-recovery period, particularly regarding the sequencing of monetary policy normalization and the prioritization of inflation volatility reduction relative to output stabilization in emerging market central bank mandates.

Keywords: *Inflation Volatility, Emerging Markets, Economic Growth, Panel VAR, Monetary Policy, Inflation Targeting, Regime Switching, Global Recovery, Threshold Effects, Macroeconomic Stability*

I. INTRODUCTION

The relationship between price instability and economic growth has occupied a central position in macroeconomic theory and policy debate since the foundational contributions of Friedman [1] and subsequent analytical developments that identified the channels through which both the level and volatility of inflation affect capital accumulation, productivity growth, and welfare. While extensive empirical literature has investigated the inflation-growth nexus at the level of inflation rates, the specific role of inflation volatility distinguished from average inflation levels by its capacity to generate uncertainty, distort price signals, and undermine the informational efficiency of market mechanisms received comparatively less systematic attention until the global financial crisis of 2008–2009 and the subsequent decade of historically low and stable inflation in advanced economies temporarily rendered the question less empirically pressing [2].

The COVID-19 pandemic and its macroeconomic aftermath have dramatically renewed the relevance of inflation volatility analysis, particularly for emerging market economies that faced the intersection of pandemic-related demand collapses, unprecedented fiscal and monetary stimulus, supply chain disruptions of historical magnitude, commodity price surges, and aggressive monetary policy normalization in advanced economies that generated capital flow reversals and exchange rate depreciation pressures [3]. The resulting inflation dynamics across the emerging market universe displayed extraordinary heterogeneity in both level and volatility dimensions, creating a natural quasi-experimental context for identifying the macroeconomic consequences of differential inflation volatility experiences during a recovery phase of globally systemic importance [4]. The theoretical mechanisms through which inflation volatility impairs economic growth are well-established in the literature but empirically difficult to isolate given the endogeneity of inflation volatility to macroeconomic conditions and the confounding effects of the same structural factors that generate both high inflation volatility and weak growth performance [5]. Investment irreversibility under uncertainty, analyzed through the real options framework of Dixit and Pindyck [6], provides a theoretically grounded mechanism whereby inflation volatility raises the option value of waiting before committing to irreversible capital expenditures, depressing investment and hence growth. Financial intermediation efficiency deteriorates under high inflation volatility as lenders demand inflation risk premia, raising the cost of capital for productive investment [7]. Long-term contracting becomes more costly as inflation volatility generates indexation demands and contract renegotiation expenses that consume resources and introduce rigidities into labour and product markets [8]. Empirical investigation of the inflation volatility-growth relationship in emerging market contexts faces methodological challenges including measurement of inflation volatility in environments with structural breaks, endogeneity between volatility and growth, heterogeneity across countries with diverse structural characteristics, and the identification of exogenous variation in inflation volatility necessary for causal inference [9]. The global recovery phase of 2020–2024 provides an unusual opportunity to address some of these challenges through the exploitation of cross-country variation generated by the interaction of global shocks with country-level structural and institutional characteristics that are plausibly exogenous to idiosyncratic country growth outcomes [10]. This paper contributes to the empirical literature on inflation volatility and economic growth through several methodological and empirical advances. First, we employ a panel vector autoregression framework that allows for rich endogenous dynamics between inflation volatility and growth while imposing common slope restrictions testable through appropriate specification tests. Second, we introduce a regime-switching component that permits the inflation volatility-growth relationship to differ across high and low inflation volatility regimes, consistent with the theoretical prediction that the growth costs of volatility are nonlinear. Third, we investigate the moderating role of monetary policy framework quality as measured by inflation targeting adoption, central bank independence, and monetary policy credibility indicators, allowing assessment of whether institutional factors that have been found to reduce inflation volatility also alter the growth consequences of remaining volatility. Fourth, we examine the transmission channels through which inflation volatility affects growth, including investment rates, financial intermediation efficiency, and total factor productivity growth, providing evidence on the theoretical mechanism predictions [11], [12].

II. OBJECTIVES

1. Analyze inflation volatility and growth link in emerging markets (2020–2024).
2. Identify thresholds where inflation volatility affects growth differently.
3. Study how monetary policy quality influences volatility-growth relationship.
4. Examine channels like investment and productivity affecting growth.
5. Suggest policy strategies for managing inflation and supporting growth.

III. RELATED WORKS

The theoretical foundations of the inflation-growth relationship were established by Tobin [13], who argued that inflation could stimulate growth by shifting portfolios toward capital, and Mundell [14], who developed the portfolio balance channel. These early theoretical contributions were superseded empirically by evidence that high inflation is consistently associated with poor growth performance, a finding documented robustly across diverse country samples and time periods by Fischer [15], who identified significant negative effects of inflation on both capital accumulation and productivity growth. The distinction between inflation levels and inflation volatility as separate growth determinants was emphasized by Judson and Orphanides [16], who demonstrated that volatility effects are empirically distinct from level effects even after controlling for mean inflation, a finding consistent with the uncertainty-investment channel operating independently of the resource allocation costs of high inflation levels. The real options approach to investment under uncertainty, developed comprehensively by Dixit and Pindyck [6], provides the most rigorous theoretical foundation for the investment channel of inflation volatility effects on growth. When capital expenditures are irreversible and cash flows are uncertain, the option to delay investment has positive value that increases with uncertainty, including inflation uncertainty. Empirical investigations of this channel by Guiso and Parigi [17] using Italian firm-level data and by Bloom [18] using aggregate data for the United States have documented economically significant negative effects of uncertainty on investment that are consistent with the real options mechanism. The extension of these frameworks to emerging market contexts where financial markets are less developed and hedging options more limited suggests that inflation uncertainty effects on investment should be more severe in the emerging market universe than in advanced economies. Panel data investigations of the inflation volatility-growth relationship specific to emerging market economies have produced findings that are broadly consistent with the prediction of negative effects but have documented substantial heterogeneity in the magnitude of these effects across country groups. Ramey and Ramey [19] documented a strong negative relationship between macroeconomic volatility, including inflation volatility, and growth in a large cross-country sample, with the relationship appearing stronger for developing economies. Easterly, Islam, and Stiglitz [20] examined the financial volatility-growth relationship and found evidence that financial sector development mediates the transmission of macroeconomic volatility to growth outcomes. Fatas and Mihov [21] investigated the role of fiscal policy volatility in growth and found evidence that policy volatility, which is correlated with inflation volatility in developing economies with limited monetary-fiscal policy coordination, exerts significant growth costs. The specific context of the COVID-19 pandemic and global recovery has been

examined in a growing literature that has highlighted the exceptional nature of inflation dynamics during this period. Ha, Kose, and Ohnsorge [22] documented that the inflation surge of 2021–2022 was global in scope but highly heterogeneous in magnitude across emerging market and developing economies, reflecting differential exposure to supply chain disruptions, commodity price shocks, and fiscal stimulus magnitudes. Alvarez and Ruane [23] examined the transmission of global supply chain disruptions to domestic inflation in emerging markets and found evidence of significant exchange rate pass-through amplification in economies with weaker monetary policy credibility. The post-pandemic monetary policy normalization process has been analyzed by Brandao-Marques et al. [24], who documented that inflation targeting frameworks provided significant benefits in terms of faster and less costly inflation reduction while maintaining more stable output growth. Inflation targeting as a monetary policy framework has been extensively evaluated for its effects on inflation outcomes, and there is substantial evidence that adoption of explicit inflation targets with operational central bank independence reduces both average inflation and inflation volatility in emerging market economies [25]. Ball and Sheridan [26] provided influential evidence that inflation targeting reduces inflation variability, and subsequent studies by Lin and Ye [27] using propensity score matching to address selection bias confirmed that targeting reduces inflation substantially. The evidence on whether inflation targeting translates improved inflation stability into better growth outcomes is more contested, with some studies finding significant growth benefits and others failing to detect robust positive effects after controlling for selection into targeting adoption [28], [29].

IV. METHODOLOGY

4.1 Data and Sample. The analysis employs annual panel data for 42 emerging market economies classified according to the IMF World Economic Outlook designation, covering the period 2017–2024 to provide pre-pandemic baseline observations alongside the recovery phase of primary analytical interest. Inflation data are sourced from IMF International Financial Statistics, with inflation volatility measured as the 12-month rolling standard deviation of monthly headline CPI inflation rates, following the approach of Judson and Orphanides [16]. Real GDP growth is sourced from the World Bank World Development Indicators. Monetary policy framework indicators are drawn from the IMF Annual Report on Exchange Arrangements and Exchange Restrictions and central bank independence indices from Dincer and Eichengreen [30]. Financial development measures follow the IMF Financial Development Index methodology.

TABLE I: Sample Emerging Market Economies by Region and Income Group

Region	No. of Countries	Avg. Inflation Volatility 2020–22 (%)	Avg. GDP Growth 2021–24 (%)	IT Adopters (%)
Sub-Saharan Africa	12	4.82	3.41	33%
Emerging Asia	10	2.14	5.87	70%
Latin America	9	5.67	2.93	78%
Eastern Europe	7	3.29	3.81	86%
Middle East & N. Africa	4	6.43	2.24	25%
Overall Sample	42	4.01	3.82	57%

4.2 Panel VAR Specification. The empirical core of the analysis is a panel vector autoregression model specified as $Y_{it} = \alpha_i + \alpha_{i1} Y_{i,t-1} + \dots + \alpha_{ip} Y_{i,t-p} + u_{it}$, where $Y_{it} = (\text{growth}_{i,t}, \text{volat}_{i,t}, \text{investment}_{i,t}, \text{TFPI}_{i,t}, \text{credit}_{i,t})'$ is the vector of endogenous variables for country i at time t , α_{ij} are matrices of autoregressive coefficients, and u_{it} is a vector of structural disturbances [31]. The lag length p is selected by Akaike Information Criterion, yielding $p=2$ for the baseline specification. Cross-sectional dependence is addressed through common correlated effects estimation following Pesaran [32], which includes cross-section averages of all variables as additional regressors to absorb common factors. Country fixed effects absorb time-invariant heterogeneity, and year fixed effects control for common global shocks. The identification of structural shocks employs a Cholesky decomposition of the residual variance-covariance matrix with ordering based on the assumption that inflation volatility innovations affect growth contemporaneously but that growth innovations affect inflation volatility only with a lag an assumption motivated by the slow adjustment of inflation expectations and price setting mechanisms relative to output dynamics. Impulse response functions are estimated with bootstrapped confidence intervals from 1,000 replications.

4.3 Threshold Regression. To identify potential threshold effects in the inflation volatility-growth relationship, we employ the panel threshold regression methodology of Hansen [33], which permits estimation of threshold parameters and coefficient vectors in the two regimes defined by whether inflation volatility falls above or below the estimated threshold. The threshold model is specified as $\text{growth}_{it} = \alpha_i + \beta_1 \text{volat}_{it} I(\text{volat}_{it} \leq \gamma) + \beta_2 \text{volat}_{it} I(\text{volat}_{it} > \gamma) + \gamma' X_{it} + u_{it}$, where γ denotes the threshold parameter estimated by concentrated least squares, and X_{it} is a vector of control variables including initial income, trade openness, financial development, and fiscal balance. The null hypothesis of no threshold effect is tested using the bootstrap procedure described by Hansen [33].

TABLE II: Panel VAR Baseline Estimation Results — Inflation Volatility Effects on Growth

Variable	Coefficient (Full Sample)	Std. Error	t-stat	Coefficient (IT Countries)	Coefficient (Non-IT Countries)
Inflation Volatility (t-1)	-0.342***	0.087	-3.93	-0.189**	-0.521***
Inflation Volatility (t-2)	-0.156**	0.064	-2.44	-0.073	-0.298***
GDP Growth (t-1)	0.312***	0.054	5.78	0.341***	0.278***
Investment Rate (t-1)	0.187***	0.041	4.56	0.201***	0.168***
Financial Development (t-1)	0.094**	0.038	2.47	0.132***	0.058
Trade Openness (t-1)	0.043*	0.024	1.79	0.051**	0.029
Inflation Level (t-1)	-0.078**	0.032	-2.44	-0.041	-0.119***

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at country level. Country and year fixed effects included. IT = Inflation Targeting.

V. RESULTS AND ANALYSIS

5.1 Baseline Inflation Volatility-Growth Relationship. The panel VAR estimation results confirm a statistically significant and economically meaningful negative relationship between inflation volatility and economic growth across the full sample of 42 emerging market economies during the global recovery phase. A one percentage point increase in the twelve-month rolling standard deviation of monthly inflation is associated with a reduction in annual GDP growth of 0.342 percentage points in the contemporaneous period and an additional 0.156 percentage points in the subsequent year, implying a cumulative two-period growth impact of approximately 0.50 percentage points [2], [4]. This effect is substantially larger than estimates from pre-pandemic panel studies, consistent with the hypothesis that the uncertainty amplification channels through which inflation volatility affects investment and financial intermediation are more potent during recovery phases characterized by heightened macro-financial vulnerabilities [15]. The heterogeneity between inflation targeting and non-inflation targeting economies is both statistically significant and economically substantial. Among inflation targeting economies, the contemporaneous effect of inflation volatility on growth is -0.189, while among non-inflation targeting economies the corresponding coefficient is -0.521, representing a differential of approximately 0.33 percentage points per unit of volatility. This result is consistent with the hypothesis that inflation targeting frameworks reduce the growth costs of given levels of inflation volatility by anchoring inflation expectations, reducing the uncertainty premium embedded in long-term interest rates, and improving the signal extraction capacity of price signals in investment decisions [27], [28].

5.2 Threshold Effects. The Hansen threshold regression analysis identifies a statistically significant threshold in the inflation volatility-growth relationship at a volatility level of 3.2 percentage points, with the null hypothesis of no threshold effect rejected at the one percent significance level. Below this threshold, the growth impact of inflation volatility is moderate at -0.187 per percentage point of volatility, while above the threshold the impact increases sharply to -0.618 per percentage point, representing a more than threefold amplification of the growth penalty in the high-volatility regime [33].

TABLE III: Threshold Regression Results Regime-Dependent Volatility Effects

Parameter	Estimate	95% Confidence Interval	Bootstrap p-value
Threshold (γ)	3.21%	[2.87%, 3.64%]	< 0.01
Beta1 (below threshold)	-0.187***	[-0.264, -0.110]	< 0.001
Beta2 (above threshold)	-0.618***	[-0.782, -0.454]	< 0.001
Threshold Effect (Beta2-Beta1)	-0.431***	[-0.621, -0.241]	< 0.001
Countries in High Regime (2022)	18 of 42	—	—
Wald Test (no threshold)	F = 14.73	—	< 0.01

5.3 Channel Decomposition: Decomposition of the inflation volatility-growth relationship into investment, financial intermediation, and total factor productivity channels reveals that investment rate suppression accounts for approximately 47 percent of the total growth effect, financial intermediation deterioration accounts for 31 percent, and TFP growth reduction accounts for the remaining 22 percent. These proportions are broadly consistent with the theoretical predictions of the uncertainty-irreversibility mechanism for the investment channel and the information cost channel for the financial intermediation component [6], [7]. The TFP channel likely reflects the resource misallocation consequences of distorted relative prices under high inflation volatility, consistent with the theoretical framework of Brunnermeier and Sannikov [34].

TABLE IV: Channel Decomposition of Inflation Volatility Growth Effects

Transmission Channel	Partial Effect on Growth	Share of Total Effect (%)	Statistical Significance
Investment Rate Channel	-0.161	47%	***
Financial Intermediation Channel	-0.106	31%	***
TFP Growth Channel	-0.075	22%	**
Total Effect	-0.342	100%	***
Indirect Effects (Cross-channel)	-0.000	< 1%	n.s.

5.4 Robustness Checks. The baseline results are robust across a comprehensive battery of specification tests including: alternative measures of inflation volatility (conditional variance from GARCH models, interquartile range of monthly inflation, variance of inflation expectations from surveys); alternative growth measures (per capita GDP growth, non-agricultural sector growth); alternative panel estimators (system GMM, bias-corrected fixed effects); exclusion of outlier countries; alternative lag structures; and alternative sample periods excluding the most acute pandemic years [35]. The threshold estimate is stable across alternative volatility measurement approaches within a range of 2.8 to 3.6 percentage points, confirming the robustness of the nonlinearity finding to measurement choices.

VI. CONCLUSION

This paper provides comprehensive empirical evidence that inflation volatility exerts a statistically significant and economically substantial negative effect on economic growth in emerging market economies during the global recovery phase of 2020–2024, with effects that are nonlinear across volatility regimes and significantly moderated by the quality of monetary policy frameworks. The identification of a threshold volatility level above which growth penalties are sharply amplified has important implications for monetary policy design, suggesting that policies aimed at preventing volatility from crossing this threshold may generate disproportionately large growth dividends. The finding that inflation targeting frameworks reduce both the level of inflation volatility and the growth cost per unit of volatility provides strong empirical support for continued investment in monetary policy institutional development in emerging market economies. The channel decomposition results, which identify investment suppression as the dominant mechanism through which inflation volatility affects growth, highlight the importance of policies that support private investment confidence during periods of macroeconomic uncertainty, including credible fiscal frameworks, exchange rate management strategies that limit currency risk amplification, and financial sector development measures that expand firms' access to long-term financing. The policy implications for the post-recovery normalization period are that emerging market central banks should prioritize inflation volatility reduction alongside inflation level stabilization, should sequence monetary policy normalization in ways that minimize volatility spikes during the transition, and should invest in communication strategies that anchor inflation expectations and reduce the uncertainty premium in long-term financial prices. Countries without inflation targeting frameworks that are considering adoption should weight the growth co-benefits of reduced inflation volatility alongside the direct inflation stabilization benefits in their framework choice calculus.

VII. FUTURE WORK

Future research should address several dimensions not fully explored in the current analysis. The dynamics of inflation volatility-growth relationships at subnational levels within emerging market economies, where regional economic structures, financial access, and institutional quality vary substantially, represent an important extension that could identify distributional dimensions of aggregate volatility effects. The role of digital financial inclusion, which has expanded significantly across emerging markets in the recovery period, in mediating the financial intermediation channel of inflation volatility deserves specific investigation. The interaction between exchange rate volatility and inflation volatility in open emerging market economies merits more systematic analysis given the importance of exchange rate pass-through in determining domestic inflation dynamics. Finally, the macroeconomic consequences of inflation volatility asymmetries whether upside inflation surges and downside deflation risk carry symmetric or asymmetric growth consequences represents an important theoretical and empirical question with significant monetary policy implications.

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