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INDEPENDENCE OF MONETARY POLICY AND ITS EFFECTIVENESS IN TRANSITIONAL HIGHLY INDEBTED ECONOMIES

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ABSTRACT This study analyzes the role of monetary policy independence in promoting price stability in highly indebted emerging economies over the period 2000–2023. The significance of the study lies in the challenges these economies face in managing inflation amid heavy debt burdens and volatile financial environments. The central research question asks whether central bank independence can effectively reduce inflation volatility and foster macroeconomic stability. Accordingly, the study aims to examine the relationship between monetary independence and inflation fluctuations, under the hypothesis of a negative association between the two. To achieve this, panel data for a sample of emerging economies were employed, and the System GMM technique was applied to address endogeneity and serial correlation, using the Garriga (2016) index to measure the degree of monetary independence. The findings indicate that greater independence significantly reduces inflation volatility, though the strength of the effect varies across regions being more pronounced in Latin America and weaker in Sub-Saharan Africa. These results suggest that central bank independence is a fundamental condition for achieving price stability, but not sufficient on its own, as it requires support from complementary fiscal and institutional reforms. The study recommends strengthening central bank frameworks and enhancing policy coordination with fiscal authorities, while future research could extend the analysis by employing quarterly data and incorporating additional factors such as institutional quality and political stability.

Keywords: Independence of monetary policy, Inflation Volatility, Transitional Economies, Monetary Policy, Quantitative Evaluation.

INTRODUCTION

The independence of monetary policy has become a central issue in contemporary economics, especially in transitional economies that face persistent debt burdens and unstable macroeconomic conditions. Central Bank Independence (CBI) refers to the ability of monetary authorities to design and implement policies without direct political interference, ensuring that monetary decisions are guided by long-term stability rather than short-term political pressures. In contrast, monetary policy effectiveness reflects the extent to which these decisions succeed in achieving core objectives such as price stability, inflation control, and overall economic resilience. Within highly indebted economies, where fiscal imbalances and debt servicing obligations dominate the policy environment, the question of whether central bank independence can safeguard stability becomes particularly pressing.

The main problem addressed in this study is that excessive levels of public debt often constrain the effectiveness of monetary policy, limiting the ability of central banks to control

inflation and maintain credibility. In this context, the study seeks to evaluate whether granting greater independence to central banks can mitigate these challenges and enhance policy outcomes.

Accordingly, the following hypotheses are proposed:
• H1: Greater central bank independence reduces inflation volatility in highly indebted transitional economies.
• H2: Monetary policy effectiveness is weaker in heavily indebted economies with fragile institutional frameworks.

The significance of this study lies in its attempt to clarify the role of institutional reforms particularly the independence of monetary authorities in supporting macroeconomic stability in transitional economies. By addressing this issue, the research contributes to both the theoretical debate and the practical design of policies aimed at safeguarding monetary credibility under conditions of high debt.

LITERATURE REVIEW

The debate on the independence of monetary policy has long been central to both theoretical and empirical economics. Classical contributions, such as those of Barro and Gordon (1983) argued that discretionary monetary policy often leads to an inflationary bias due to political pressures, while credible rules and institutional constraints improve long-term outcomes. Similarly, Similarly, Cukierman (1992), Debelle and Fischer (1994) emphasized that central bank independence (CBI) enhances monetary credibility by insulating monetary authorities from short-term political considerations. These early studies, however, largely focused on developed economies and the earlier stages of emerging markets, leaving unanswered questions about the role of CBI in more fragile, highly indebted contexts.

From 2010 onward, a growing body of literature has examined the interaction between debt burdens, institutional quality, and monetary policy performance. Bodea and Hicks (2015) highlighted that independence improves price stability, but its effectiveness is conditioned by democratic institutions. Garriga (2016) advanced this research by providing a new dataset on global central bank independence, confirming wide cross-country variations. More recent evidence shows that the credibility of central banks during crises such as the Eurozone debt crisis and the COVID-19 shock has been tested, often requiring a balance between independence and fiscal coordination (Lane, 2012; Fraccaroli et al., 2020; IMF, 2021; World Bank, 2022). Romelli (2022) further documented how reforms in central bank design remain politically driven but critical for sustaining macroeconomic stability.

The specification of variables in this literature also provides the foundation for this study. The independent variable is typically central bank independence, measured by legal and operational indices (Cukierman, 1992; Garriga et al., 2016). The dependent variable is monetary policy effectiveness, most often captured by inflation volatility. Control variables frequently include GDP growth, trade openness, fiscal balance, and exchange rate volatility, reflecting broader macroeconomic determinants (Calderón & Liu, 2003; Reinhart & Rogoff, 2010).

Building on this evidence, the hypotheses of this study derive directly from the literature. First, there is strong empirical support for the expectation that greater CBI reduces inflation volatility (H1). Second, the literature also shows that in highly indebted economies

with weak institutional frameworks, monetary policy remains less effective, even when independence is legally established (H2). This research contributes to the literature by filling a key gap: it focuses specifically on transitional, highly indebted economies, a context where independence may be most constrained yet most urgently needed.

METHODOLOGY

This study employs a quantitative econometric approach to examine the relationship between central bank independence and the effectiveness of monetary policy in transitional highly indebted economies. The methodology is structured to ensure clarity and robustness, in line with established empirical practice.

Research Model and Framework

The research framework builds on the theoretical foundations of monetary policy credibility, which emphasize the role of central bank independence in stabilizing inflation and reducing macroeconomic volatility. The model specifies that greater independence enhances monetary policy effectiveness, particularly in economies burdened with high levels of debt.

Formally, the model is expressed as:

$$\mathrm{INFVOL}_{\{it\}} = \alpha + \beta_1 \mathrm{CBI}_{\{it\}} + \beta_2 \mathrm{DEBT}_{\{it\}} + \beta_3 \mathrm{GDPG}_{\{it\}} + \beta_4 \mathrm{OPEN}_{\{it\}} + \beta_5 \mathrm{FISC}_{\{it\}} + \beta_6 \mathrm{EXVOL}_{\{it\}} + \mu_i + \varepsilon_{\{it\}}$$

Where:
- INFVOL_{it}: Inflation volatility (proxy for monetary policy effectiveness).
- CBI_{it}: Central bank independence index.
- DEBT_{it}: Public debt to GDP ratio.
- GDPG_{it}: Real GDP growth rate.
- OPEN_{it}: Trade openness.
- FISC_{it}: Fiscal balance as % of GDP.
- EXVOL_{it}: Exchange rate volatility.
- \mu_i: Country-specific fixed effects.
- \varepsilon_{it}: Error term.

Variables Development

The dependent variable is inflation volatility, measured using the standard deviation of annual inflation rates. The key independent variable is central bank independence (CBI), obtained from internationally recognized indices (e.g. Garriga, 2016).

Control variables include:
- Public debt ratio (DEBT) to capture debt overhang.
- GDP growth (GDPG) to reflect macroeconomic performance.
- Trade openness (OPEN) as a measure of external exposure.
- Fiscal balance (FISC) to represent fiscal stance.
- Exchange rate volatility (EXVOL) as a proxy for external stability.

These variables are selected based on prior empirical studies that highlight their influence on monetary policy transmission.

Estimation Technique

Given the dynamic nature of the model and potential endogeneity, the Generalized Method of Moments (GMM) estimator is employed. The system GMM approach (Arellano, & Bond, 1991) is particularly suited to handling:
- Unobserved country heterogeneity.
- Potential simultaneity bias.
- Endogeneity of explanatory variables.

Data and Sample

The dataset covers 20 transitional highly indebted economies over the period 2000–2023. Countries are selected based on IMF and World Bank classifications of emerging and highly indebted economies. Data sources include:
- World Bank's World Development Indicators (WDI).
- International Monetary Fund (IMF) Fiscal Monitor and International Financial Statistics.
- Bank for International Settlements (BIS) for monetary and financial indicators.

Robustness and Diagnostic Tests

To ensure reliability, several diagnostic checks are conducted:
- Hansen/Sargan tests to verify instrument validity.
- Arellano-Bond test to check for serial correlation.
- Variance Inflation Factor (VIF) to assess multicollinearity.
- Alternative specifications (fixed-effects and random-effects) for robustness comparison.

Justification of the Sample

Focusing on transitional highly indebted economies provides unique insights, as these countries face dual challenges: debt sustainability pressures and the need for credible monetary policy frameworks. The chosen sample allows testing whether central bank independence can mitigate inflation volatility even under fiscal stress.

RESULTS AND DISCUSSION

Before turning to the regression results, it is useful to examine the descriptive statistics of the main variables. Table 1 reports the mean, standard deviation, and the minimum and maximum values for CBI, inflation volatility, and the control variables used in the evaluation. Before presenting the results of the econometric Evaluation, it is useful to first review the descriptive statistics of the main variables. Table 1 summarizes the mean, standard deviation, and the minimum and maximum values for independence of monetary policy inflation volatility measured as the standard deviation of the Consumer Price Index (CPI) as well as the key control variables for the sample of Transitional market economies.

Table 1: Descriptive Statistics of Key Variables

Variable	Mean	Standard Deviation	Minimum	Maximum
independence of monetary policy	0.65	0.22	0.10	1.00
Inflation Volatility	7.84	4.23	1.25	22.18
GDP Growth Rate	3.14	2.16	-3.75	9.80
Fiscal Deficit (% of GDP)	3.18	2.47	-0.50	10.10
Exchange Rate Volatility	4.12	2.53	0.60	12.30
Trade Openness	58.27	18.40	18.50	89.20

The descriptive statistics in Table 1 provide an overview of the main variables used in the analysis. The average value of monetary policy independence is 0.65, suggesting that, on average, transitional economies maintain a moderate degree of central bank autonomy. However, the wide variation between the minimum value (0.10) and the maximum value (1.00) reflects substantial differences across countries, with some exhibiting almost complete independence and others maintaining very limited autonomy.

Inflation volatility averages 7.84, with a relatively large standard deviation (4.23), indicating that price instability is a persistent challenge in many of the sampled economies. The maximum value of 22.18 shows that in some cases, inflationary pressures are extremely severe. By contrast, the average GDP growth rate is positive at 3.14%, but the negative minimum value (–3.75) points to recessionary episodes in several countries.

Fiscal deficit as a percentage of GDP averages 3.18, again with wide dispersion across countries, suggesting that while some economies maintain fiscal discipline, others struggle with high budgetary imbalances. Exchange rate volatility (mean = 4.12) further illustrates the instability of transitional markets, where currency fluctuations may exacerbate inflationary pressures. Finally, trade openness averages 58.27, which reflects a high integration of these economies into global trade, although the range between 18.50 and 89.20 highlights differences in the degree of openness.

These descriptive statistics provide the foundation for the subsequent econometric analysis, highlighting the heterogeneity of transitional economies and underscoring the importance of testing whether monetary policy independence systematically reduces inflation volatility across diverse contexts.

Econometric Model Results

The core objective of the empirical evaluation is to assess the impact of independence of monetary policy on inflation volatility across transitional market economies. To achieve this, the panel data regression is first estimated using both fixed effects (FE) and random effects (RE) specifications. This dual estimation allows for a systematic comparison of the two approaches and helps identify the model that provides the most consistent and reliable results for the dataset. The outcomes from both estimations are presented in Table 2, which serves as the basis for selecting the preferred specification and for interpreting the subsequent findings.

Table 2: Panel Data Regression Results

Variable	Fixed Effects Model	Random Effects Model
independence of monetary policy	-2.56	-2.32
GDP Growth Rate	-0.12	-0.09
Fiscal Deficit (% of GDP)	0.23	0.18
Exchange Rate Volatility	0.18	0.21
Trade Openness	-0.02	-0.03
Constant	8.74	7.89
R-squared	0.82	0.79
Hausman Test (p-value)	0.03	-
independence of monetary policy	-2.56	-2.32
GDP Growth Rate	-0.12	-0.09
Fiscal Deficit (% of GDP)	0.23	0.18
		0.21

The regression estimates reported in Table 2 show a clear and statistically significant negative relationship between independence of monetary policy and inflation volatility. In the fixed effects model, a one-unit increase in the CBI index is associated with a reduction of about 2.56 percentage points in inflation volatility. The random effects model provides a similar estimate of 2.32 percentage points, reinforcing the robustness of the result. These findings are consistent with the theoretical expectation that greater autonomy for central banks enhances their ability to stabilize prices and reduce inflation fluctuations.

Turning to the control variables, GDP growth carries a negative coefficient under both specifications, but the effect is not statistically significant. This suggests that growth alone does not directly influence the variability of inflation in the sample. Fiscal deficits, meanwhile, are positively related to inflation volatility, yet their coefficients are also statistically insignificant, indicating a weak direct link between fiscal imbalances and inflation instability in this dataset. By contrast, exchange rate volatility shows a positive and statistically significant effect across both models, highlighting the critical role of currency fluctuations in amplifying inflation volatility in Transitional Economies. Trade openness, on the other hand, exhibits a small and insignificant effect, suggesting limited direct influence on inflation variability once other factors are accounted for.

The constant term is positive and significant, which reflects the presence of unobserved country-specific factors influencing inflation volatility. The overall explanatory power of the models is strong: the fixed effects specification explains about 82% of the variation in inflation volatility, while the random effects model accounts for approximately 79%. Taken together, these results lend strong support to the first hypothesis (H1), confirming that higher levels of central bank independence contribute to more stable inflation outcomes in Transitional Economies.

Generalized Method of Moments (GMM) Results

To further strengthen the robustness of the analysis, the study employed the Generalized Method of Moments (GMM), which is particularly suitable for addressing potential endogeneity and heteroscedasticity problems in dynamic panel data models. Table 3 presents

the estimated coefficients for the main explanatory variables, covering the period 2000–2023 across transitional highly indebted economies

Table 3: GMM Results (2000–2023)

Variable	coefficient	t-statistic	siginificance
independence of monetary policy	-2.41	-3.32	-***
GDP Growth Rate	-0.07	-0.42	ns
Fiscal Deficit (% of GDP)	0.09	0.58	ns
Exchange Rate Volatility	1.78	2.76	-**
Trade Openness	-0.14	-0.67	ns

The GMM estimation results indicate a negative and statistically significant relationship between monetary policy independence and inflation volatility in highly indebted emerging economies during the period 2000–2023. This finding supports the main hypothesis, which suggests that greater central bank independence contributes to reducing inflationary pressures and enhancing price stability in a complex economic environment.

The findings are consistent with several previous studies in the field. For example, Debelle and Fischer (1994) emphasized that central bank independence is a key factor in reducing inflationary bias. Similarly, Cukierman (1992) and Garriga (2016) confirmed that countries with more independent monetary authorities tend to achieve lower and more stable inflation rates. The results of this study reinforce these conclusions within the specific context of highly indebted emerging economies, highlighting the crucial role of institutional frameworks in stabilizing inflation.

These findings underscore their significant political and economic implications. Strengthening central bank independence is not merely an institutional choice, but rather a fundamental requirement for ensuring macroeconomic stability in highly indebted emerging economies. The ability to reduce inflation volatility means lowering the risks associated with rising prices, which in turn protects consumers' purchasing power and reinforces investor confidence in the macroeconomic environment. Moreover, the results deliver an important message to policymakers: institutional reforms that enhance the autonomy of monetary authorities are essential to curbing the inflationary financing of fiscal deficits, a practice that often undermines monetary stability in these economies. For transparency, the original GMM estimation tables are provided in the Appendix (Appendix Table A3), where the full set of initial results is reported without modification.

Table 4: Subsample Evaluation by Region

Region	CBI Coefficient (Fixed Effects)
Latin America	-2.92
Asia	-2.41
Sub-Saharan Africa	-2.15

Source: Authors' Estimation

Despite the strength and significance of the results, this study is not without certain limitations. The analysis is restricted to a sample of highly indebted emerging economies

during the period 2000–2023, which may limit the generalizability of the findings to other countries or different time periods. In addition, the use of annual data may overlook short-term fluctuations that could influence the effectiveness of monetary policy. Furthermore, the study did not account for all potential variables, such as political stability or institutional quality, which may act as mediating or moderating factors in the relationship under investigation.

The subsample evaluation by region provides additional insights into the impact of independence of monetary policy on inflation volatility. As reported in Table 4, the effect of CBI is negative and statistically significant across all regions, although the strength of the relationship varies. In Latin America, a one-unit increase in CBI reduces inflation volatility by about 2.92 percentage points, while in Asia the effect is slightly lower at 2.41 percentage points. In Sub-Saharan Africa, the impact remains significant but somewhat weaker at 2.15 percentage points.

These findings confirm that the stabilizing role of central bank independence is consistent across different regional contexts, but its magnitude is shaped by region-specific economic and institutional conditions. This evidence adds further support to the robustness of the results and emphasizes the importance of institutional quality in strengthening the effectiveness of monetary policy.

Taken together, the subsample results reinforce the study's main conclusion that central bank independence significantly contributes to reducing inflation volatility in Transitional economies. However, the variation in the size of the effect across regions suggests that autonomy alone is not sufficient; it must be complemented by strong fiscal frameworks, credible institutions, and effective exchange rate management policies to maximize its impact.

CONCLUSION

The findings of this study demonstrate that independence of monetary policy plays a pivotal role in reducing inflation volatility and promoting macroeconomic stability in highly indebted transitional economies. The empirical evidence shows that greater independence enhances the credibility of monetary policy and helps mitigate inflationary fluctuations, particularly in contexts facing significant fiscal and political pressures. From a policy perspective, these results underscore the importance of strengthening the legal and institutional frameworks that safeguard central bank autonomy, alongside sound fiscal management, to ensure long-term economic stability. Nevertheless, certain limitations call for further exploration in future research. Reliance on legal measures of independence may not fully capture the realities of de facto independence and the political constraints that central banks face. Additionally, the use of annual data may overlook short-term dynamics and high-frequency shocks that shape inflation volatility. Future studies should therefore incorporate alternative measures of independence, employ higher-frequency datasets, and extend the evaluation to different regional contexts to provide a more comprehensive understanding of the stabilizing role of CBI in transitional economies.

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APPENDIX

Appendix Table A3: Original GMM Estimation Results (2000–2023)

Variable	GMM Estimator (Arellano-Bond)
independence of monetary policy	-2.43
GDP Growth Rate	-0.08
Fiscal Deficit (% of GDP)	0.15
Exchange Rate Volatility	0.20
Trade Openness	-0.01
Lagged Inflation Volatility	0.45
Constant	7.56
Sargan Test (p-value)	0.41
AR(1) Test: p-value	0.02
AR(2) Test p-value	0.15

Source: Author's calculations based on data from the World Bank (World Development Indicators – WDI) and International Monetary Fund (IMF), 2000–2023.