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Abstract

This study investigates the relationship between monetary policy frameworks and stock market volatilities across countries. Using a novel classification framework by Cobham (2021), we study 84 countries across the world over the period of 1984 to 2017. We find that countries that maintain a fixed exchange rate peg tend to experience higher levels of stock market volatility, while countries adopting flexible inflation-targeting policies tend to exhibit lower levels of stock market volatilities. Additionally, the stock markets of countries operating under monetary policies characterized by unstructured discretion tend to be more volatile, while those operating with well-structured discretion tend to be more stable. Our results also suggest that while the choice of monetary policy framework is an important determinant of stock market volatility, it is not the only factor driving it. As such, policymakers should carefully consider the implications of different monetary policy frameworks when designing monetary policy, and take a holistic approach to financial stability that incorporates a range of factors beyond just monetary policy frameworks.

Keywords: Monetary policy frameworks, stock market volatility, exchange regimes, inflation-targeting

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1. Introduction

Central banks worldwide have adopted different monetary policy frameworks (MPFs) to achieve macroeconomic objectives. These frameworks range from strict exchange rate pegs to flexible manipulation of monetary variables and have been extensively studied for their impact on inflation, unemployment, and output growth. Experts, including Borio (1997), agree that MPFs have "significant implications for […] asset price volatility". In fact, Eichengreen and Tong (2003) found a positive correlation between the monetary volatility and stock market volatility (SMV) of 12 advanced economies over the long run. They interpreted this as evidence of the importance of a country's MPF to the volatility of its stock market.

However, the relationship between MPFs and SMV remains controversial due to the intricate interplay between a country's MPF and exchange regime, as well as the conduct and nature of the monetary regime. For example, the "volatility transfer" hypothesis suggests that fixing exchange rates should induce higher volatility in a country's interest rates, money supplies, prices, output, and stock market for a given set of random shocks. In contrast, floating exchange rates insulate domestic economies from external shocks by functioning as automatic shock absorbers that self-adjust to mitigate the impact of these shocks (Friedman, 1953). However, this theoretical insulation property relies on rigid assumptions that are often not met in the real-world (Shafer et al., 1983). Empirical evidence on the relationship between exchange regimes and SMV has unsurprisingly been ambiguous, with some studies (Artis and Taylor, 1994; Frenkel and Mussa, 1980) finding that fixed exchange-rate economies tend to exhibit higher SMV in the face of undefined random shocks, while others (Blau, 2018; Kennedy and Nourzad, 2016) have noted a positive relation between the volatilities of flexible exchange rates and stock markets. The relationship between exchange regimes and SMV therefore remains controversial.

In addition, a country's MPF's impact on its SMV is influenced not only by its official exchange regime but also by the central bank's approach to monetary policy conduct and implementation. Transparent, credible, and rules-based frameworks with clear policy objectives and tools can reduce uncertainty and prevent volatility spillovers to other financial markets, leading to lower stock price volatility (Bomfim, 2003; Konrad, 2009). Eichengreen and Tong (2003) found that Australia's SMV only started to decline in the 1980s and 1990s after the Reserve Bank of Australia adopted the rule-based inflation-targeting framework for its monetary policy. They warned that any country whose "exchange rate anchor for monetary policy is [being] cut adrift […] to put another anchor such as inflation targeting in its place" so as to stymie SMV.

Some academics however argue that discretionary policy can still be desirable under certain conditions, such as during turbulent times when policymakers may need to respond innovatively. However, empirical evidence has been mixed. Meredith (1992) found that simple rules failed to stabilize economic variables more successfully than discretionary policies in Japan over the period of 1986-91. Ohanyan and Grigoryan (2021) found a significant positive association between SMV and policy discretion, while Marinescu and Horobet (2015) found that as the general level of discretion in monetary policy increases, the response of the stock market becomes increasingly erratic.

Further empirical research is needed to explore the relationship between MPFs and SMV. This study uses a novel classification framework developed by Cobham (2021) that incorporates external and domestic targets, announced objectives, and realized outcomes. This classification framework distinguishes itself from others (IMF, 2021; Levy-Yeyati and Sturzenegger, 2005; Ilzetzki et al., 2022) as it incorporates both external and domestic targets, as well as both announced objectives and realized outcomes. This allows for a more complete analysis of the relationship between SMVs and the entire spectrum of MPFs. We find that, as consistent with conventional economic theory, countries maintaining a fixed exchange rate peg tend to experience higher SMVs, while those adopting flexible inflation-targeting policies tend to exhibit lower SMVs. Additionally, countries with

unstructured discretion tend to experience higher SMVs, while those with well-structured discretion tend to display lower SMV.

This study has both theoretical and practical significance. Firstly, it contributes to the understanding of the relationship between MPFs and SMVs on a global scale by utilising a comprehensive classification framework. Secondly, because the volatility of stock prices is a fundamental concept in traditional asset pricing theory (Sharpe,1964; Black et al.,1972; Markowitz; 1952), identifying the MPFs that influence security volatility is important. Thirdly, understanding how monetary volatility affects stock price volatility is also important for managerial decision-making as different types of volatility can impact firms' costs of capital (Beaver et al, 1970; Bekaert and Wu, 2000).

This paper is structured as follows. Section 2 examines the data and methodology employed in this study, while Section 3 discusses our empirical findings. Section 4 concludes this paper.

2. Data and Methodology

This section provides a brief overview of the variables and methodology used in our analysis. Our study covers 84 countries across the globe, and we use data from 1984 to 2017, resulting in an initial unbalanced dataset of 1,957 country-year observations. All the data used in our study is obtained from the World Bank.

2.1 Dependent variable: Stock market volatility

The literature on econometric modeling of financial time series lacks a widely accepted definition of volatility measurement. In this study, we adopt the methodology employed by Officer (1973), Mader (1984), and Schwert (1989) to measure stock market volatility. We calculate stock market volatility, $SMV_{i,t}$, as the standard deviation of daily stock market returns for each calendar year, where *i* represents the respective country and *t* the calendar year. The use of standard deviation as a volatility measure is valuable as it provides a summary measure of the likelihood of encountering extreme returns. However, this approach assigns equal weight to all observations in the sample, disregarding the potential impact of more recent innovations. Therefore, volatility clustering and "fat tails" are not accounted for using this methodology.

2.2 Explanatory variables: Monetary policy frameworks

We employ the Cobham (2021) classification scheme to represent the MPFs of different countries. This classification system covers both domestic and external monetary policy targets, as well as both de jure and de facto targets, allowing for a more nuanced analysis to be performed. The 32 MPFs are aggregated into broader categories based on target monetary variables, with different types of targets combined into a single category of inflation, exchange rate, monetary, or mixed targeting, while retaining three types of discretion. Table 1 shows the details of the aggregation and the MPF classifications dummy variables. We use loosely structured discretion (LSD) as the reference benchmark variable framework.

2.3 Control variables

In our analysis, we include several key macroeconomic variables that have been theorized or empirically demonstrated to influence SMVs as control variables.

Real GDP growth has been identified as a determinant of SMV in numerous studies (Officer, 1973; Paye, 2012). It is therefore included as a control variable in our analysis.

Inflation impacts SMV by eroding consumer purchasing power and increasing uncertainty around expected stock returns, directly affecting investors' return expectations. Engle and Rangel (2005) found that countries with high inflation rates tend to exhibit greater stock volatilities. We measure inflation using GDP deflators.

Interest rates can influence SMV by affecting borrowing costs, investment and consumption behaviors, and investor demand for different assets. Although Shiller (1987) found that interest rate changes explain only some of the observed stock volatility, but interest rates are still included as a control variable in this study. Lending rates are used to measure interest rates.

The inclusion of investment spending as a control variable in this study is debatable. According to neoclassical investment theory, excess SMV increases firms' costs of equity, leading to lower real investment spending. However, Paye (2012) found a positive relationship between the investment-to-capital ratio and SMV. To ensure completeness, the investment-to-capital ratio is included as a control variable in this analysis.

Money supply changes are linked to stock prices fluctuations. Alshogeathri (2011) suggests that money supply shifts affect stock markets by changing interest and discount rates, altering the net present value of cash flows. Friedman and Schwartz (1963) argue that exogenous shocks to money supply alter the equilibrium position of money relative to other assets, resulting in increased SMV. Money supply growth is used as a control variable.

The Mixture of Distribution hypothesis (Clark, 1973) believes that SMV is influenced by the arrival of new information that affects expectations of future corporate earnings and changes in stock prices. Trading volume as a proportion of GDP is used as a proxy for this relationship, following Touny et al. (2021) and Belhaj and Abaoub (2015). A positive contemporaneous relationship between the two is expected.

The domestic stock market size can impact SMV. Larger stock markets offer greater diversification opportunities, higher liquidity, and attract more foreign investments, all of which help to mitigate volatility. We use stock market capitalization as a percentage of GDP as our metric in this analysis.

Haddad et al. (2013) argue that the level of economic openness affects the transmission of adverse external shocks to domestic stock markets due to international risk sharing. More open economies are more interconnected with global markets and therefore more exposed to external shocks, resulting in higher SMV. Trade openness is measured here as the sum of the exports and imports as percentages of GDP (Cobham et al., 2022).

Following Cobham et al. (2022), we perform fixed-effects regressions for the dependent variable $SMV_{i,t}$. The regressions take the generalised form:

$$SMV_{i,t} = \alpha + \beta_1 ERfix_{i,t} + \beta_2 ERtarget_{i,t} + \beta_3 MT_{i,t} + \beta_4 IT_{i,t} + \beta_5 MixedT_{i,t} + \beta_6 UD_{i,t} + \beta_7 WSD_{i,t} + \beta_8 No\_nat\_MPF_{i,t} + \beta_i Control\_Var\_j_{j,t} + \varepsilon_t \quad (1)$$

where *Control_Var_j* represents the relevant aforementioned control variable.

Due to the unbalanced nature of our dataset, we run these regressions using one control variable at a time. The number of observations are reduced by more than half when all the control variables are applied simultaneously.

3. Empirical findings

3.1 Descriptive Statistics

Table 2 presents the descriptive statistics of the variables analyzed in this study. The average annual SMV across all countries over the time period is relatively high with a wide range of outcomes. The distribution of the dependent SMV variable is skewed to the right and has heavy tails that is more peaked than a normal distribution. These features are consistent existing literature (Chib et al., 2022; Abanto-Valle et al., 2014).

The MPF dummy variables' mean values indicate the number of country-year occurrences for each MPF. LSD is most common, accounting for almost one-third of the observations, followed by ERtarget, which accounts for slightly over one-fifth of the sample set. Inflation-targeting is fairly common and accounts for 15% of the observations. Consistent with Cobham's (2022) findings, WSD is the least adopted.

3.2 Graphical Analysis

We perform a graphical analysis of average SMVs of different MPFs from 1984 to 2017 (Figure 1). SMVs of most frameworks appear elevated in 1988, 1999, and 2009, coinciding with the aftermath of the Stock Market Crash of 1987, the Asian Financial Crisis, and the GFC, respectively. LSD economies display the highest average SMV over the entire period, while WSD economies show the lowest although this regime only came into existence near the latter part of the sample period. MTs show lower SMV, and economies with no_nat_MPF and MixedTs show particularly erratic SMVs. Countries with an IT framework generally have less volatile stock markets. This is consistent with previous studies that show that inflation targeting can help stabilise inflation while reducing macroeconomic and stock market volatilities.

3.3 Regression Analysis

Table 3 shows the regression results of our unbalanced fixed-effects estimations, testing the effects of different MPFs on country SMVs. MPFs play an important role in determining SMV, with the signs of most regression coefficients consistent with monetarists theory. Rule-based regimes such as inflation-, monetary- and exchange rate-targeting frameworks tend to have lower SMVs than countries with LSD frameworks, although only the coefficient of ITs is statistically significant. This finding is consistent with previous studies showing that inflation targeting can help stabilise inflation and reduce SMVs (Bernanke et al., 1999; Eichengreen and Tong, 2003).

Countries with ERfix frameworks tend to have higher SMVs, consistent with the "impossible trinity" literature (Mundell, 1963). Countries with UD frameworks have higher SMVs compared to the LSD ones, which is in-line with the findings of existing studies (Ohanyan and Grigoryan, 2021; Marinescu and Horobet, 2015). The R-squared of all the regressions, however, show that while MPFs are statistically important determinants of SMVs, they still cannot explain a significant amount of observed market volatility, a conclusion similarly reached by Schwert (1989) and Shiller (1987).

The results in columns 2-9 show that our earlier findings are robust to the inclusion of control considerations, and highlight the importance of other macroeconomic variables in explaining SMVs . The inflation rate, interest rate, money supply growth and stock traded as a percentage of GDP all have positive effects on SMVs. Higher levels of openness in countries tend to lower SMVs, indicating that international trade and capital flows can diversify risk and stabilise financial markets (Kose et al., 2003).

The study suggests that MPFs are crucial in determining country SMVs, and policymakers should carefully consider the trade-offs between benefits and potential costs of different frameworks like inflation targeting and exchange rate targeting.

3.3.12 Sensitivity checks

We conduct a series of checks to test the sensitivity of our findings, and while we performed regressions using the same methodology and control variables, we only report the results of the regression of the dependent SMV variable against the MPF dummy variables for brevity. Our findings for all regressions are the same.

3.3.2.1 Country categories

In our first robustness check, we conducted a sample break by country categories into advanced and emerging economies, and the results in columns 10 and 11 of Table 4 show that ERfix and WSD, which are largely artifacts of emerging economies, are positively associated with SMV. The inflation targeting (IT) framework is negatively associated with SMV in both country categories, although the effect is only statistically significant and larger in emerging economies. The ERtarget framework has a statistically significant negative effect on SMV only in advanced economies, and a statistically negligible impact on that of emerging economies. However, in both sets of economies, the UD framework has a strong positive effect on SMVs, providing evidence that MPFs play a crucial role in determining SMVs across different country categories.

3.3.2.2 Time periods

In our second robustness check, we split the sample into two time periods: 1984-2007 (The Great Moderation) and post-GFC (2008 onwards). The results in columns 12 and 13 of Table 4 show that the ERfix, UD, and WSD frameworks were only practiced before the GFC, and their relationships with SMVs are consistent with our earlier analysis. The IT framework has a dampening impact on SMV before and after the GFC, with the magnitude of its impact reduced after the crisis. The effect of ERtarget however reversed from being negatively to being positively associated with SMV. Our findings suggest that the impact of different MPFs on SMVs may vary across different time periods, and policymakers should consider changing economic conditions when designing monetary policy.

3.3.2.3 Endogeneity

Although casual empiricism and the findings of Cobham and Song (2020) support the notion that a country's chosen MPF is not endogenous to its SMV, we still perform fixed-effects regressions using MPF dummy variables lagged by one period to mitigate this possibility of endogeneity. The results in Column 14 of Table 4 show that many of our earlier findings remain unchanged. Countries with IT, ERtarget, MT, and WSD frameworks tend to have less volatile stock markets, while those with UD and ERfix frameworks tend to have more volatile stock markets. The statistical significance of these relationships is largely similar, except for ERfix. These findings provide further support for the robustness of our earlier results and suggest that the relationship between MPFs and SMVs is not driven by endogeneity.

4. Conclusion

Our study investigates the relationship between monetary policy frameworks and stock market volatilities across countries. Countries with fixed exchange rate frameworks and unstructured discretion tend to experience higher levels of SMV, while countries with flexible inflation-targeting policies and well-structured discretion tend to exhibit lower levels of SMVs. The implications are that policymakers should consider a range of factors beyond just monetary policy frameworks when designing policy while investors should also pay attention to the monetary policy frameworks of countries in which they invest to better manage portfolio risk.

References

1. Abanto-Valle, C., Dey, D. and Lachos, V., 2014. Stock return volatility, heavy tails, skewness and trading volume: A Bayesian approach. Federal University of Rio de Janeiro Working Paper. Pp 1-29.
2. Alshogeathri, M., 2011. Macroeconomic determinants of the stock market movements: Empirical evidence from the Saudi stock market. Kansas State University.
3. Artis, M., Taylor, M., 1994. The stabilizing effect of the ERM on exchange rates and interest rates. International Monetary Fund Staff Paper no. 41, pp. 123-148.
4. Beaver, W., Kettler, P. and Scholes, M., 1970. The association between market determined and accounting determined risk measures. The Accounting Review 45, pp. 654–682.
5. Bekaert, G. and Wu, G., 2000. Asymmetric volatility and risk in equity markets. The Review of Financial Studies 13(1), pp. 1-42.
6. Belhaj, F. and Abaoub, E., 2015. A generalized autoregressive conditional heteroskedasticity examination of the relationship between trading volume and conditional volatility in the Tunisian stock market: Evidence for the information dlow paradigm. International Journal of Economics and Financial Issues 5(2), pp.354-364.
7. Bernanke, B., Laubach, T., Mishkin, F. and Posen, A., 1999. Inflation targeting: Lessons from the international experience. Princeton, NJ: Princeton University Press.
8. Black, F., Jensen, M. and Scholes, M., 1972. The capital asset pricing model: Some empirical tests. Studies in the Theory of Capital Markets, edited by M. Jensen. Westport, CT: Praeger.
9. Blau, B., 2018. Exchange rate volatility and the stability of stock prices. International Review of Economics & Finance 58, pp.299-311.
10. Bomfim, A., 2003. Pre-announcement effects, news effects, and volatility: Monetary policy and the stock market. Journal of Banking and Finance 27(1), pp.133-151.
11. Borio, C., 1997. Monetary policy operating procedures in industrial countries. BIS conference papers vol. 3, pp. 286-368.
12. Chib S, Nardari F and Shepard N., 2002. Markov chain monte carlo methods for stochastic volatility models. Journal of Econometrics 108, pp. 281–316
13. Clark, P., 1973. A subordinated stochastic process model with finite variance for speculative prices. Econometrica 41, pp. 135–155.
14. Cobham, D., Macmillan, P., Mason, C. and Song, M, 2022. Economic performance under different monetary policy frameworks. Journal of Policy Modeling. 44(2), pp. 431-449.
15. Cobham, D., 2021. A comprehensive classification of monetary policy frameworks for advanced and emerging economies. Oxford Economic Papers 73(1), pp. 2–26.
16. Cobham, D., 2022. Monetary policy frameworks since Bretton Woods across the world and its regions.
17. Cobham, D. and Song, M., 2020. How do countries choose their monetary policy frameworks?. Journal of Policy Modeling 42(6), pp. 1187-1207.
18. Eichengreen, B. and Tong, H., 2003. Stock market volatility and monetary policy: what the historical record shows. Asset Prices and Monetary Policy 108, p.142.
19. Engle, R. and Rangel, J., 2005. The spline GARCH model for unconditional volatility and its global macroeconomic causes. Technical report, NYU and UCSD.
20. Frenkel, J. and Mussa, M., 1980. The efficiency of foreign exchange markets and measures of turbulence. American Economic Association Paper Proceedings 70, pp. 374-381
21. Friedman, M., 1953. The case for flexible exchange rates. Essays in Positive Economics. Chicago University Press, Chicago.
22. Friedman, M., and Schwartz, A., 1963. Money and business cycles. Review of Economics and Statistics 45, pp. 32-64.
23. Haddad, M., Lim, J., Pancaro, C. and Saborowski, C., 2013. Trade openness reduces growth volatility when countries are well diversified. Canadian Journal of Economics/Revue canadienne d'économique 46(2), pp.765-790.
24. Ilzetzki, E., Reinhart, C. and Rogoff, K., 2022. Rethinking exchange rate regimes. In Handbook of international economics Vol. 6, pp. 91-145. Elsevier.
25. International Monetary Fund. 2021. Annual report on exchange arrangements and exchange restrictions : Overview. Washington, DC: IMF.

26. Kennedy, K. and Nourzad, F., 2016. Exchange rate volatility and its effect on stock market volatility. International Journal of Human Capital in Urban Management.
27. Konrad, E., 2009. The impact of monetary policy surprises on asset return volatility: the case of Germany. Financial Markets and Portfolio Management 23(2), pp.111-135.
28. Kose, M., Prasad, E. and Terrones, M., 2003. How does globalization affect the synchronization of business cycles?. American Economic Review 93(2), pp.57-62.
29. Levy-Yeyati, E. and Sturzenegger, F., 2005. Classifying exchange rate regimes: Deeds vs. words. European Economic Review 49(6), pp.1603-1635.
30. Mader, R., 1984. Financial market volatility-the Austrian case. BIS A.
31. Marinescu, I. and Horobet, A., 2015. Rules and Discretion in monetary policy: Is the response of the stock market rational?. Expert Journal of Economics 3(1), pp.50-62.
32. Markowitz H., 1952. Portfolio selection. Journal of Finance 7(1), pp. 77–91.
33. Meredith, M., 1992. Discretionary monetary policy versus rules: the japanese experience during 1986-91. International Monetary Fund.
34. Mundell, R., 1963, Capital mobility and stabilization policy under fixed and flexible exchange rates. Canadian Journal of Economics 29, pp. 475-485.
35. Officer, R., 1973. The variability of the market factor of the new york stock exchange. Journal of Business 46(3), pp. 434-453.
36. Ohanyan, N. and Grigoryan, A., 2021. Measuring monetary policy: rules versus discretion. Empirical Economics 61, pp.35-60.
37. Paye, B., 2012. 'Déjà vol': Predictive regressions for aggregate stock market volatility using macroeconomic variables. Journal of Financial Economics 106(3), pp. 527-546.
38. Schwert, G., 1989. Why does stock market volatility change over time?. Journal of Finance 44(5), pp.1115-1153.
39. Shafer, J., Loopesko, B., Bryant, R. and Dornbusch, R., 1983. Floating exchange rates after ten years. Brookings Papers on Economic Activity 1983(1), pp.1-86.
40. Sharpe, W., 1964, Capital asset prices: A theory of market equilibrium under conditions of risk. Journal of Finance 19(3), pp. 425-442.
41. Shiller, R., 1987. The volatility of stock market prices. Science, 235(4784), pp.33-37.
42. Touny, M., Radwan, M. and Alayis, M., 2021. Macro determinants of stock market volatility: evidence from Middle East region. Afro-Asian Journal of Finance and Accounting 11(3), pp.376-391.

Figure 1: Time Series Plots of Average Stock Market Volatility of Countries Under Different Monetary Policy Frameworks, 1984 - 2017

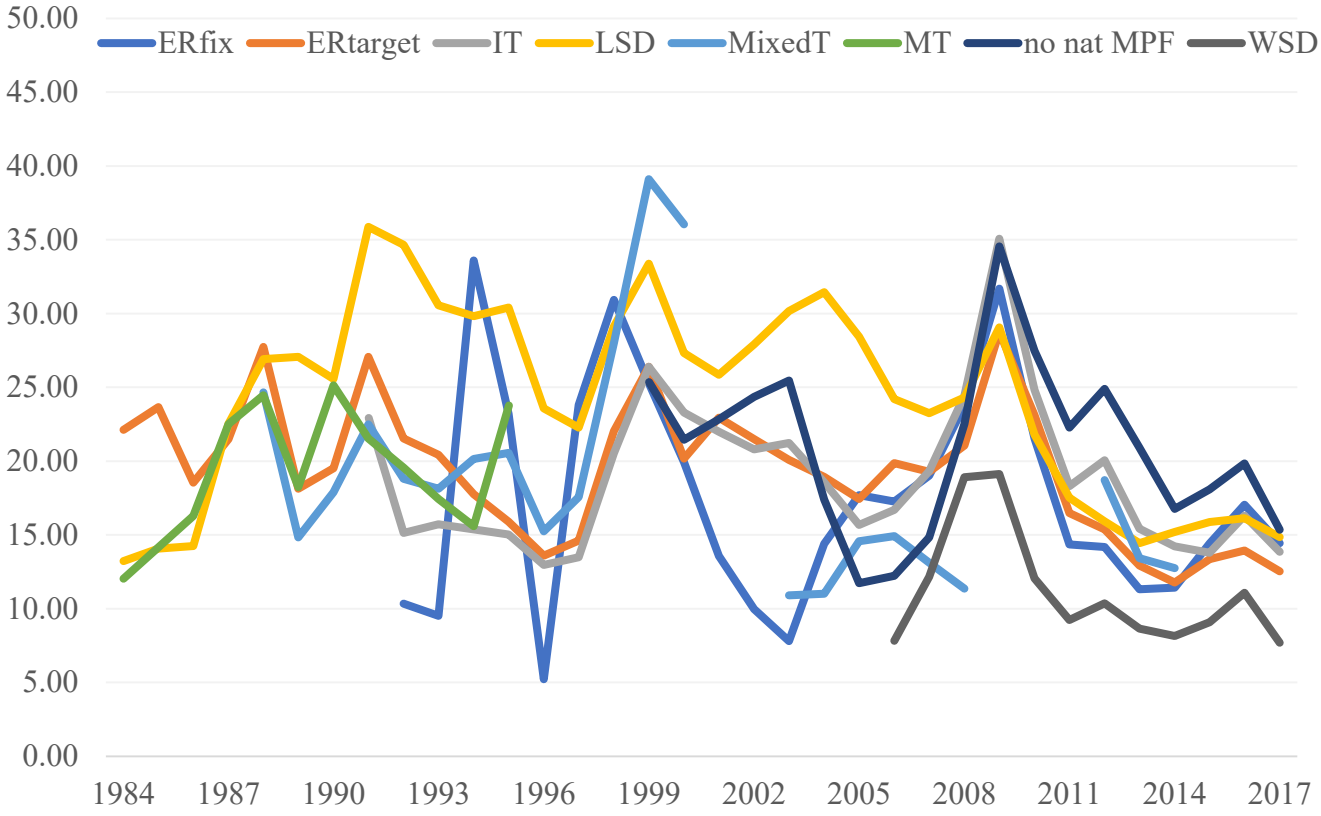

Table 1: Aggregation of Monetary Policy Frameworks

Target Variable Monetary Policy Framework	Frameworks (on the Full Menu) Included
Direct Controls (MDC)	Multiple Direct Controls (Command Economy)
Exchange Rate Fixing (ERfix)	Pure and Augmented Exchange Rate Fix; Pure Currency Board
Exchange Rate Targeting (ERtarget)	Augmented Currency Board; Full and Loose, Stationary and Converging, Exchange Rate Targeting
Monetary Targeting (MT)	Full and Loose, Stationary and Converging, Monetary Targeting
Inflation Targeting (IT)	Full and Loose, Stationary and Converging, Inflation Targeting
Mixed Targeting (MixedT)	All Combinations Of Monetary, Exchange Rate And Inflation Targeting
Unstructured Discretion (UD)	Unstructured Discretion
Loosely Structured Discretion (LSD)	Loosely Structured Discretion
Well Structured Discretion (WSD)	Well Structured Discretion
No National Framework (no_nat_MPF)	Membership Of Currency Union, Use Of Another Sovereign's Currency

Table 2: Descriptive statistics

Variable	Mean	Standard deviation	Maximum	Minimum	Skewness	Kurtosis
Dependent variable:						
Stock market volatility (SMV)	20.664	13.259	163.657	1.973	3.820	28.678
Explanatory variables:						
Direct controls (MDC)	0.024	0.154	1.000	0.000	6.191	39.334
Exchange rate fixing (ERfix)	0.070	0.255	1.000	0.000	3.378	12.414
Exchange rate targeting (ERtarget)	0.210	0.408	1.000	0.000	1.421	3.020
Monetary targeting (MT)	0.029	0.167	1.000	0.000	5.633	32.730
Inflation targeting (IT)	0.152	0.359	1.000	0.000	1.937	4.751
Mixed targeting (MixedT)	0.028	0.165	1.000	0.000	5.727	33.802
Unstructured discretion (UD)	0.071	0.258	1.000	0.000	3.327	12.069
Loosely structured discretion (LSD)	0.316	0.465	1.000	0.000	0.791	1.625
Well structured discretion (WSD)	0.003	0.059	1.000	0.000	16.917	287.170
No national framework (No_nat_MPF)	0.096	0.294	1.000	0.000	2.749	8.558
Control variables:						
Real GDP growth	3.651	5.087	88.958	-42.451	1.525	33.901
Inflation rate	21.692	169.906	6261.240	-27.632	21.548	612.236
Interest rate	17.489	107.006	4260.014	0.000	33.663	1272.384
Investment (as % of capital stock)	0.108	0.040	0.404	0.007	1.568	8.389
Money supply growth	30.041	170.793	6384.916	-58.172	24.127	752.875
Stock traded volume (as % of GDP)	30.041	64.801	952.667	0.001	6.382	63.268
Stock market cap (as % of GDP)	64.357	107.473	1777.283	0.009	8.187	91.754
Openness	82.426	60.844	442.620	4.921	2.466	11.241

Table 3: Regression of Country Stock Market Volatilities to Monetary Policy Framework Classifications and Other Control Variables

Following Cobham et al. (2022), we perform fixed-effects regressions for the dependent variable $SMV_{i,t}$. The regressions take the generalised form:

$$SMV_{i,t} = \alpha + \beta_1 ERfix_{i,t} + \beta_2 ERtarget_{i,t} + \beta_3 MT_{i,t} + \beta_4 IT_{i,t} + \beta 5 MixedT_{i,t} + \beta 6 UD_{i,t} + \beta 7 WSD_{i,t} + \beta 8 No\_nat\_MPF_{i,t} + \beta_j Control\_Var\_j_{i,t} + \varepsilon_t$$

The monetary policy framework classifications dummy variables are $ERfix_{i,t}$, $ERtarget_{i,t}$, $MT_{i,t}$, $IT_{i,t}$, $MixedT_{i,t}$, $UD_{i,t}$, $WSD_{i,t}$ and $No\_nat\_MPF_{i,t}$, which take the value of 1 when country *i* is classified as exchange rate fixing, exchange rate targeting, monetary targeting, inflation targeting, mixed targeting, unstructured discretion, well-structured discretion and no national framework respectively. The dummy variables take the value of 0 otherwise. Loosely structured discretion (LSD) is used as the reference benchmark variable framework. $Control\_Var\_j_{i,t}$ represents the control variable that is employed in the specific regression. .Z-values for the panel regressions are shown in parentheses. Significance levels: *** = 1%, ** = 5%, * = 10%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Control variable used							
		Real GDP growth	Inflation rate	Interest rate	Investment (as % of capital stock)	Money supply growth	Stock traded volume (as % of GDP)	Stock market cap (as % of GDP)	Openness
Control variable	-	-0.295***	0.012***	0.006***	-55.514***	0.013***	0.008*	-0.008***	-0.016
	-	(-4.002)	(8.949)	(2.607)	(-5.380)	(8.536)	(1.659)	(-2.860)	(-1.228)
ERfix	28.624***	29.074***	28.325***	-	27.008***	-	30.519***	30.697***	28.114***
	(3.727)	(3.843)	(3.810)	-	(3.418)	-	(4.461)	(5.413)	(3.693)
ERtarget	-2.259	-1.915	-1.937	-2.631	-4.543***	-1.417	-0.856	0.871	-2.334
	(-1.517)	(-1.273)	(-1.312)	(-1.349)	(-2.753)	(-0.788)	(-0.572)	(0.649)	(-1.572)
MT	-3.498	-2.857	-3.164	-2.201	-2.821	-3.301	-1.723	-0.617	-3.277
	(-1.396)	(-1.150)	(-1.299)	(-0.49)	(-1.071)	(-1.21)	(-0.761)	(-0.329)	(-1.317)
IT	-5.444***	-5.522***	-4.858***	-3.651***	-4.496***	-4.217***	-4.750***	-1.516*	-4.729***
	(-5.758)	(-5.601)	(-5.001)	(-3.501)	(-4.187)	(-4.114)	(-5.131)	(-1.847)	(-4.830)
MixedT	-3.972*	-4.207*	-4.725**	-5.778	-3.130	-1.394	-0.440	-0.651	-4.083*
	(-1.915)	(-1.941)	(-2.221)	(-0.98)	(-1.382)	(-0.332)	(-0.221)	(-0.361)	(-1.908)
UD	17.054***	15.720***	9.851***	4.922*	18.265***	12.432***	35.272***	58.667***	15.351***
	-7.540	(6.746)	(4.104)	(1.679)	(6.968)	(3.812)	(11.176)	(14.319)	(6.677)
WSD	-12.577***	-12.832***	-12.455***	-12.686***	-13.116***	-12.212***	-12.200***	-11.459***	-12.813***
	(-3.360)	(-3.481)	(-3.438)	(-3.531)	(-2.988)	(-3.158)	(-3.672)	(-4.160)	(-3.454)
No_nat_MPF	-0.283	-0.590	-0.414	-9.333*	1.265	-	4.254**	4.817***	0.066
	(-0.171)	(-0.352)	(-0.252)	(-1.875)	(0.673)	-	(2.534)	(3.109)	(0.039)
R-squared	0.067	0.073	0.104	0.038	0.103	0.11	0.125	0.179	0.06
Observations	1957	1905	1905	1156	1499	1412	1548	1409	1912

Table 4: Robustness checks

	(10)	(11)	(12)	(13)	(14)
	Different country categories		**Different time periods**		**Assuming endogeneity**
	Advanced economies	Emerging economies	The Great Moderation (Pre-2008)	Post-GFC (Post-2008)	Lagged MPFs
ERfix	-	27.729***	27.239***	-	6.839
	-	(3.203)	(3.460)	-	(0.901)
ERtarget	-5.771***	0.880	-5.416***	8.165*	-2.802**
	(-3.164)	(0.412)	(-2.994)	(1.886)	(-1.971)
MT	-0.169	-	-4.136	-	-4.263*
	(-0.086)	-	(-1.525)	-	(-1.845)
IT	-0.856	-9.354***	-5.494***	-9.454***	-5.876***
	(-0.784)	(-6.750)	(-4.501)	(-4.137)	(-6.496)
MixedT	-3.963*	-5.534	-3.838	-13.078***	-3.033
	(-1.853)	(-1.433)	(-1.570)	(-2.690)	(-1.523)
UD	10.943**	17.472***	14.840***	-	16.706***
	(2.547)	(6.349)	(6.089)	-	(8.265)
WSD	-	-11.436***	-14.929*	-	-12.188***
	-	(-2.712)	(-1.960)	-	(-3.316)
No_nat_MPF	-0.085	-1.776	-2.286	-2.001	-1.641
	(-0.046)	(-0.661)	(-1.059)	(-0.413)	(-1.031)
R-squared	0.056	0.095	0.080	0.044	0.068
Observations	724	1233	1125	832	2031