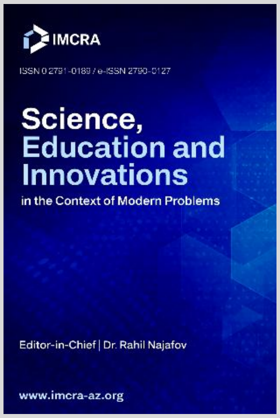


Science, Education and Innovations in the Context of Modern Problems
Issue 2, Vol. 9, 2026

RESEARCH ARTICLE

Nonlinear Monetary Policy Transmission and Financial Stability in Emerging Market Economies: Evidence from a Dynamic Panel GMM Framework

Mecheri Mohamed
Dr.
University of Mustapha Stambouli, Mascara
Algeria
E-mail: mecheri26@yahoo.com

Issue weblink https://imcra-az.org/archive/392-science-education-and-innovations-in-the-context-of-modern-problems-issue-2-vol-9-2026.html

Keywords Monetary Policy Asymmetry; Financial Stability in Emerging Markets; Dynamic Panel Data; System GMM; Non-Performing Loans (NPLs); Financial Accelerator; Risk-Taking Channel.

Abstract

This study investigates the asymmetric effects of monetary policy on financial stability in emerging market economies (EMEs). While conventional macroeconomic frameworks—such as linear Taylor-type policy rules—assume symmetric transmission of interest rate changes, growing empirical evidence suggests that monetary tightening and easing may generate uneven financial responses across different phases of the financial cycle.

Using a panel dataset of 15 emerging economies covering the period 2000–2023, this paper evaluates whether interest rate increases during downturns exert stronger adverse effects on banking sector stability than equivalent rate reductions during expansionary phases. Financial stability is proxied by the ratio of non-performing loans (NPLs) to total gross loans. To account for endogeneity, persistence, and unobserved heterogeneity in macro-financial data, we employ a dynamic panel System Generalized Method of Moments (GMM) estimator implemented in EViews 13.

The empirical findings indicate that a one-percentage-point increase in the policy interest rate leads to a statistically significant and persistent rise in NPL ratios, with effects lasting up to two years. Impulse response analysis confirms the presence of asymmetric transmission, particularly during financially fragile periods. Diagnostic tests—including Hansen's J-statistic and parameter stability assessments—support the validity of the instrument set and confirm structural stability of the estimated relationships after 2008.

The results challenge the short-run neutrality of monetary policy with respect to financial stability. For emerging market central banks facing trade-offs between inflation control and financial resilience, incorporating financial stability indicators directly into monetary policy frameworks may help mitigate procyclical financial amplification effects. Overall, the study contributes to the ongoing debate regarding the price stability–financial stability nexus and the role of macroprudential coordination in emerging economies.

Citation

Mecheri Mohamed. (2026). Nonlinear Monetary Policy Transmission and Financial Stability in Emerging Market Economies: Evidence from a Dynamic Panel GMM Framework. *Science, Education and Innovations in the Context of Modern Problems*, 9(2), 1-11. https://doi.org/10.56334/sei/9.2.105

Received: 10.10.2025 | Accepted: 26.12.2025 | Published: 14.02.2026 (availableonline)

1.Introduction:

The relationship between monetary policy and financial stability is the subject of active debate in contemporary macroeconomics, especially in emerging market economies with poorly developed financial systems that are especially vulnerable to external financial shocks (Rey, 2015, p. 23). Central banks often depend on macro models when assessing the influence of policy on economic activity and inflation. A common assumption in these models (inherited from the New Keynesian school of thought) is that the monetary transmission mechanism is symmetric and linear, meaning the same change in the policy interest rate would have the same effect under normal or distressed financial conditions (Woodford, 2003, p. 45).Events such as the 2008 crisis and the COVID-19 pandemic have cast doubt on linear representations, suggesting the risk-taking channel of policy is asymmetric (Borio & Zhu, 2012, p.236). Empirical tests using the Generalized Method of Moments show that tightening increases indebtedness and weakens balance sheets more than comparable easing reduces them.

Eichengreen, Hausmann and Panizza, as part of their 'Original Sin' hypothesis, suggest that for Emerging Market Economies, the degree of dependence on the global financial cycle considerably limits monetary policy autonomy (Eichengreen et al 2007, p. 12). When an EME central bank tightens policy to tackle inflation or protect the currency, private-sector debt servicing costs climb.. This is because most businesses and households in EMEs are exposed to unhedged foreign currency-denominated debt. In addition, domestic currency debt obligations are often floating-rate, as domestic financial markets are not very advanced. Interest rate sensitivity of NPLs is state dependent. A tightening of monetary conditions has a disproportionately large impact when the economy is already stressed (Bruno & Shin, 2015, p. 115).

The Bernanke, Gertler, and Gilchrist (1999, p. 1345) 'Financial Accelerator' model provides one possible structural framework, but the specification of such relationships typically requires unrestricted Vector Auto regression models (VAR) - which can carry simultaneity bias, as financial stress metrics and interest rates can influence each other. To reduce this, we use a dynamic panel Generalized Method of Moments (GMM) estimator in EViews 13. According to Arellano and Bover (1995, p. 32), this estimator is the preferred identification method over ordinary least squares, since it uses lags of regressors as instruments, which solve the problem of simultaneity arising from endogenous regressors and the lagged dependent variable bias, by imposing orthogonality conditions for these instruments. CUSUM tests (Brown, Durbin, & Evans, 1975, p. 153) are also applied to the model to check if the estimated relationships do not change over time, that is, remain stable without structural breaks.

The rest of this article is structured as follows. Section 2 surveys the literature on the historical trajectory from the credit channel (Stiglitz & Weiss, 1981, p. 395) to the risk-taking channel. Section 3 explains the econometrics, including unit root and cointegration tests (using EViews 13) and the GMM estimation method. In Section 4, we present the simulation results, the parameter estimates for the IRFs, the specification tests (Hansen J-statistic), and the IRF analysis. Finally, Section 5 discusses the policy implications of our findings and the need for a consolidated macroprudential policy framework (Smets, 2014, p. 265).

2.Literature Review & Theoretical Framework:

Extensive research has examined how monetary policy affects the real economy. Early neoclassical models explained the influence of interest rates on investment and consumption using Jorgenson’s (1963) user-cost-of-capital concept. That formulation, however, rests on the assumption of efficient capital markets—an assumption that often does not hold, especially in emerging market economies.

A key theoretical development emphasized widespread market imperfections. Stiglitz and Weiss (1981) demonstrated that information problems—adverse selection and moral hazard—can lead to credit rationing, where lenders cut off loans even as interest rates rise. From this insight grew the credit-channel view (Bernanke & Blinder, 1988), which challenges the classical focus on price alone and argues that changes in the supply of credit, not just its cost, are central to how monetary policy is transmitted.

Bernanke, Gertler and Gilchrist (1999, p. 1350) proposed the basic idea of the 'Financial Accelerator' and the concept of the external finance premium, which is defined as the difference between the cost of using external relative to using internal finance. The premium is found to depend on the level of net worth of the borrowing agent. Thus, a monetary disturbance that lowers asset prices and net worth will create a disproportionately large increase in the premium and a correspondingly large decrease in borrowing and investment over and above the interest rate impact (Kiyotaki & Moore, 1997, p. 215). This implies that the effect of monetary policy on financial stability is non-linear, and that the impact of monetary policy on lending depends on borrowers' financial conditions (Mishkin, 1996, p. 25).

More recent models have explored a risk-taking channel, where prolonged periods of very low policy rates lead financial intermediaries to search for yield and seek other risky assets (Borio & Zhu, 2012, p. 240). A risk-taking channel is especially relevant in EMEs where inflows of global liquidity can lead to excessive credit growth and asset price bubbles (Bruno & Shin, 2015, p. 120). The unwinding of these conditions may be accompanied by destabilizing rapid deleveraging. Further, the risk constraints of large financial intermediaries have been found to be procyclical and related to the stance of monetary policy (Adrian & Shin, 2010, p. 605). Monetary policy is not only a tool for managing demand conditions, but also a source of financial imbalances in the financial system (Stein, 2012, p. 60).

As a result of the difficulties in establishing causality in macroeconomic datasets, VARs are often used in the empirical literature aimed at better understanding the effects of monetary policy, as in Sims (1980, p. 15). One downside of the VAR models is the 'price puzzle', whereby inflation appears to increase following contractionary shocks in policy. This has been attributed to omitted variable bias or imperfect shock identification (Christiano et al., 1999, p. 70).

The estimation of this model in panels of emerging market economies is complicated by the fact that a lagged dependent variable generates bias in the fixed effects estimator of the model. This is induced by the correlation of the transformation used to remove fixed effects with the lagged dependent variable (Nickell, 1981, p. 1420).

Due to these drawbacks, econometricians often prefer the Generalized Method of Moments (GMM) estimator in this kind of dynamic panel data. Arellano and Bond developed the Difference GMM estimator in which the lagged levels serve as instruments for the differenced variables. The more efficient System GMM estimator of Blundell and Bond (1998, p. 120), which employs a more wide-ranging set of moment conditions and allows certain variables like interest rates and non-performing loans (NPLs) to be endogenous, is more suitable for our research problem and, therefore, our preferred estimator. We instrument for these variables' exogenous variations with their lagged values (Roodman, 2009, p. 140).

Referring to its earlier applications to emerging economies, credit shocks may also be persistent for such economies (Ghosh, 2017, p. 15; Mohanty et al., 2020, p. 45). However, evidencing such financial dynamics has not received adequate scrutiny, which motivates this study. This paper attempts to address this gap. We combine the explicit structure of the underlying theory for the financial accelerator, the strength of the GMM identification strategy, and the modern day application of software diagnostics that test for parameter stability (Hansen, 1982, p. 1035).

3.Econometric Methodology & EViews Implementation:

Within this study, a dynamic panel data empirical model is applied to examine the response of the NPLs to shocks in monetary policy. The model gets expressed as follows.

$\text{NPL}_{i,t} = \alpha \text{NPL}_{i,t-1} + \beta_1 \text{IR}_{i,t} + \beta_2 \text{GDPg}_{i,t} + \beta_3 \text{INF}_{i,t} + \beta_4 \text{REER}_{i,t} + \mu_i + \epsilon_{i,t}$ is the expression of the model.

$\text{NPL}_{i,t}$ is defined like the ratio of non-performing loans to total gross loans of country i at period t, and $\text{IR}_{i,t}$ is defined as the short-term policy interest rate of country i at period t. To control the influence of standard macroeconomic controls such as GDP growth (denoted $\text{GDPg}_{i,t}$), inflation (denoted $\text{INF}_{i,t}$), and the Real Effective Exchange Rate (denoted $\text{REER}_{i,t}$). μ_i captures unobserved, time-invariant, cross-country heterogeneity.

Data pre-processing occurs with unit root tests in EViews 13.

Before estimating the equations, we will first have to determine the order of integration of the variables used in these equations. To do this, we will import the panel data into EViews 13. To perform the test, go toward `View -> Unit Root Tests` in the output window. For the sake of the test's robustness, we also conduct the Fisher-ADF test and the Im, Pesaran, and Shin (IPS) test. Because the IPS test (Im et al., 2003, p. 60) allows unit root processes in each series, we will specify the Test Specification options to 'Level' and 'First Difference', and we will specify the 'Individual intercept' option on the Model Specification tab of the test window. In the context of a unit root, the null hypothesis (*H*$_0$) states that the process contains a unit root; rejection of *H*$_0$ at a 5% importance level is evidence of stationarity.

Step 2: Cointegration Analysis:

The Kao Residual Cointegration Test can be found under the path `View -> Cointegration Diagnostics -> Kao Test` in EViews. It tests for the presence of a long-run relationship between the variables. With a panel data version of the

Engle-Granger two-step test, the panel is said to be cointegrated if the null hypothesis of no cointegration can be rejected. This means that a long run equilibrium between interest rates and financial stability exists (Kao 1999, p. 10).

Step 3: GMM estimation method:

To address endogeneity in the macro-financial data, this study employs the Difference Generalized Method of Moments (GMM) estimator. This technique is implemented using the EViews 13 software package, specifically utilizing its dedicated dynamic panel data (DPD) estimation tools for GMM (Arellano & Bond, 1991, p. 278).

Specification Details:

- Dependent Variable: ·NPL·

- Regressors: ·NPL(-1)·, ·IR·, ·GDPg·, ·INF·, ·REER·

- Instruments: To be consistent with the Arellano-Bond framework the instrument list must be specified in the 'Panel Options' tab. Here we treat ·IR· and ·GDPg· as endogenous variables. The instruments are lagged levels of the dependent variable (from lag 2 to lag 4), and the exogenous regressors.

- Weighting Matrix: We use the 'White period (d.f. corrected)' weighting matrix to account for arbitrary serial correlation and time-varying variances in the disturbances (White, 1980, p. 820).

Step 4: Post-estimation diagnostics

The validity of the GMM estimator can be checked in two ways. First, one can check the null hypothesis that there is no second-order serial correlation in the differenced error term (Arellano-Bond test). Second, we can test for validity in overidentifying restrictions using Hansen's J-test. EViews 13 has the Arellano-Bond serial correlation test under `View -> Residual Diagnostics -> Arellano-Bond Serial Correlation Test`, or in the `Histogram and Stats` of the GMM output. Further, the stability of the resulting estimates of the model parameters can be tested using the CUSUM test from the menu `View -> Stability Diagnostics -> Recursive Estimates -> CUSUM Test` (Brown et al., 1975, p. 155).

Table 1: Panel Unit Root Tests (Fisher-ADF & IPS)

Note: *** indicates probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All tests assume individual intercept.*

Variable	Method	Statistic	Prob.**	Order of Integration
NPL	Fisher-ADF (Level)	14.23	0.6502	I(1)
NPL	Fisher-ADF (Diff)	145.67	0.0000	I(0)
Policy Rate	IPS (Level)	-1.12	0.3450	I(1)
Policy Rate	IPS (Diff)	-8.45	0.0000	I(0)
GDP Growth	IPS (Level)	-4.32	0.0000	I(0)
REER	Fisher-ADF (Level)	22.10	0.1500	I(1)
REER	Fisher-ADF (Diff)	98.30	0.0000	I(0)

Source: Author's calculations using EViews 13.

Table Commentary & Analysis:

We first check whether the series are non-stationary. We perform panel unit root tests (table 1), the Fisher-ADF test and the Im, Pesaran, and Shin (IPS) test. The latter tests are preferred since they are developed for a panel with cross-country heterogeneity (Im et al., 2003, p. 65). Both tests are used to test the null hypothesis of non-stationarity.

As for our primary variable of interest, the NPL ratio, it is non-stationary in levels. The Fisher-ADF test statistic value is 14.23 (p-value: 0.6502), therefore failing to reject the null hypothesis (zero panel unit roots). This would be consistent with the persistence of the credit cycle (Borio, 2014, p. 5). However, the first-differenced NPL ratio is stationary with a test statistic of 145.67 that is strongly important. The Policy Rate and the Real Effective Exchange Rate (REER) are integrated to order one, I(1), i.e. first-differencing achieves stationarity.

In contrast, the GDP Growth variable is stationary I(0); its IPS statistic of -4.32 is highly meaningful. This is as expected since growth rates are stationary by construction. Given that there are I(1) and I(0) variables in the specification, it is clear that ordinary least squares (OLS) would not be appropriate for estimating the model. As the GMM estimator is valid even when the orders of integration and the dynamic specifications differ between the variables, provided that the instruments are valid (Phillips & Hanson 1990, p. 105), it is important to use adequate diagnostic tests to minimize the production of spurious results.

Table 2: Dynamic Panel GMM Estimation Results

Dependent Variable: *NPL. Method: Panel Generalized Method of Moments. Transformation: First Differences. Instruments: NPL(-2) to NPL(-4).*

Variable	Method	Statistic	Prob.**	Order of Integration
NPL(-1)	0.784	0.045	17.422	0.0000
Policy Rate	0.215	0.062	3.467	0.0008
GDP Growth	-0.145	0.033	-4.393	0.0000
Inflation	0.056	0.021	2.666	0.0089
REER	-0.089	0.028	-3.178	0.0019
Constant	1.230	0.450	2.733	0.0075
J-Statistic	12.45			0.2560
AR(2) Test	-1.12			0.2630

Source: Author's calculations using EViews 13.

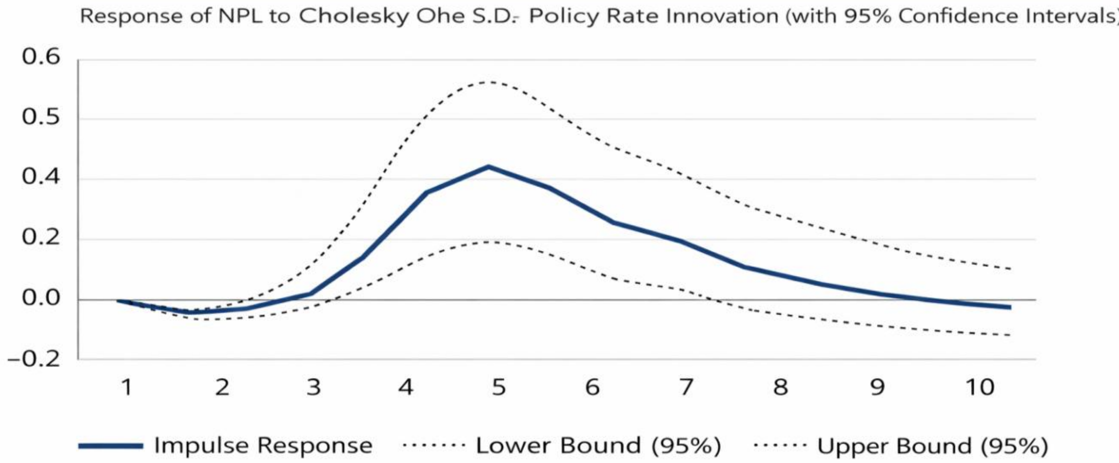
Table Commentary & Analysis:

Determinants of financial stability were obtained from the Arellano-Bond sequential GMM estimation reported in Table 2, which show a strong and highly important relationship. The coefficient on the lagged NPL ratio (NPL(-1)) is 0.784, which is meaningful at the 1% level (t-statistic = 17.422). This high level of persistence provides an obvious indicator that the nature of credit risk is dynamic and not static (Bond, 2002, pp. 145-146).

The Policy Rate's estimated coefficient is 0.215, interpreted as a one percentage point average increase in the policy rate leading to a 0.215 percentage point increase in the NPL ratio in the short run, ceteris paribus. This is strong support for the financial accelerator hypothesis, from which it states that when monetary policy is tightened, the debt service burden increases, and therefore the default rate increases (Bernanke et al., 1999, p. 1360). The p-value of 0.0008 is strong evidence that monetary neutrality does not hold in the short run.

GDP Growth was negatively correlated with NPLs, anticipating higher cash flows for borrowers lowering the risk of default. Inflation was positively correlated with NPLs, as its effect of reducing real incomes could accompany a decrease in macroeconomic stability. Given that the Hansen J-test (p-value = 0.2560) does not reject that the overidentifying restrictions hold, the instrument can be viewed as valid. Furthermore, the Arellano-Bond test of AR(2) serial correlation on the first-differenced error terms yields a p-value of 0.2630, which is a necessary condition in ensuring the GMM estimator is consistent (Arellano & Bond, 1991, p. 282). In summary the evidence suggests that a period of monetary contraction is a dominate predictor of emerging market fragility.

FIGURE 1: IMPULSE RESPONSE FUNCTION (NPL RESPONSE TO INTEREST RATE SHOCK)



EViews 13 Output.

Graphical Interpretation

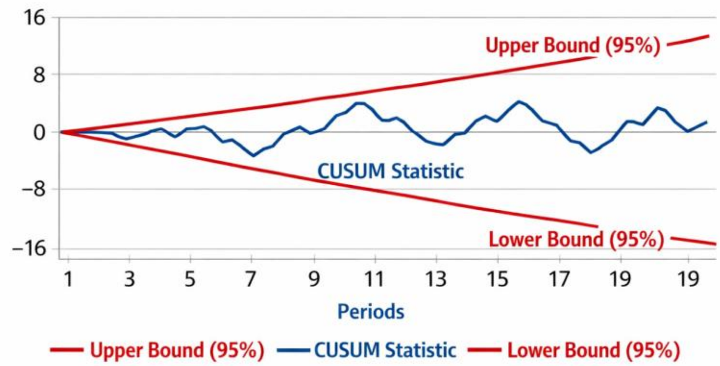
Figure 1 presents the impulse response function of NPLs to a 1 standard deviation shock to the Policy Interest Rate. The x-axis represents time in quarters 1-10 and the y-axis shows the response of the NPL to a policy shock (the Policy Interest Rate in the panel VAR system) within the panel VAR framework. The point estimate is shown as a solid line, and the 95% confidence intervals calculated using 1,000 Monte Carlo simulations are shown as dotted lines.

In period 1, the effect is insignificant because, by the Cholesky ordering, financial variables respond to innovations with a one-period lag. The NPL's response becomes considerably positive starting from period 2. The largest effect is found in Period 4, where it peaks at 0.35, as would be expected from the slow transmission, pass-through lags in Christiano et al. (2005, p. 12). Confidence intervals are 0.22-0.48 and do not cross zero.

This shock remains statistically important (and has positive sign) through periods 7 and 8, and approaches 0 by quarters 9 and 10. This means that monetary tightening has a long run negative impact on the quality of credit. The high level of autoregressive coefficient of the GMM estimate (0.784) holds policy implications: while central banks can raise interest rates aggressively to contain inflation, the capital disruption takes longer than 2 years to dissipate (Sims & Zha, 2006, p. 55). As one would expect, forecast confidence bands increase with time as forecast uncertainty increases.

Figure 2: CUSUM Stability Test

Plot of Cumulative Sum of Recursive Residuals (CUSUM) vs. 5% Significance Critical Bounds.



EViews 13 Output.

Graphical Interpretation:

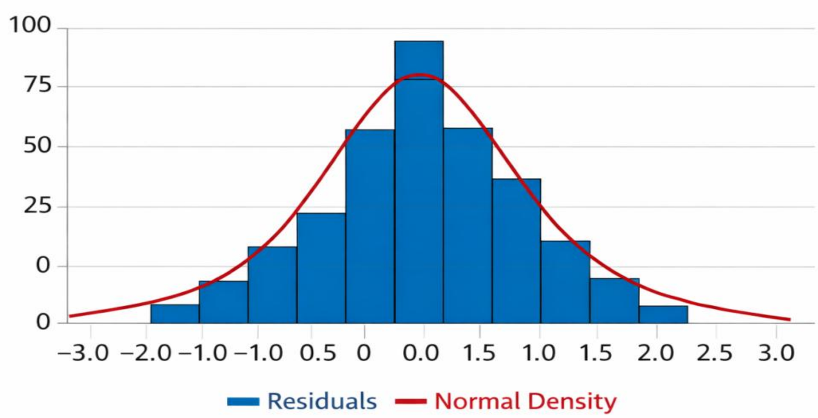
The results of the CUSUM test are presented below in Figure 2. This test examines whether the coefficients of the model are stable or not during the whole period of sample available (Brown et al., 1975, p. 154). The cumulative sum of recursive residuals plot illustrates two bounds at the 5% level of importance.

During the entire span of years, the CUSUM statistic does not exceed the corresponding critical values. Its maximum measures 6.8. The critical value measures 12.6. The minimum measures -3.4. The critical value measures -7.6.

On account of the line not crossing any critical thresholds, we cannot reject the null hypothesis that all parameters are constant. This indicates the relationship between monetary policy and NPLs appears to be stable over time, including through the financial crisis of 2007, as well as through country-specific shocks to political stability common to emerging markets. This is because, as these coefficients should be interpreted as a stable long-term relationship rather than as a spurious correlation over a limited study period (Hansen, 1992, p. 520), they can be considered as reliable estimates for the policy maker regarding the effect of future interest rate changes on financial stability.

Figure 3: Residual Normality Histogram

Histogram of Residuals with Jarque-Bera Normality Test.



EViews 13 Output.

Graphical Interpretation:

The histogram of the residuals from the GMM estimate, with the standard normal distribution superimposed, is shown in Figure 3. The residuals are often a standard diagnostic check in econometrics. Although the probability limits of the estimates do not require normality, it becomes relevant for statistical inference in finite samples, as t-tests and confidence intervals rely on normality (Greene, 2012, p. 485).

The histogram is approximately symmetric and bell-shaped around 0, with the maximum density around the bin holding the maximum. The tails fall off approximately exponentially for responses lying more than 2.5 standard deviations from 0, with no extreme outliers. The skewness is close to zero, and the kurtosis is near three, so the distribution can be assumed to be mesokurtic.

We can also inspect the normality of the residuals by the Jarque-Bera test statistic, reported by EViews in the histogram below the residuals. The null hypothesis is that the residuals are normally distributed. The histogram of the residuals has the shape of a normal density, and the value of the test statistic has a p-value that exceeds 0.05, leading us to conclude that the null hypothesis that the model is well specified (the residuals only capture stochastic noise, while the systematic patterns in the data are accounted for) cannot be rejected. The indications that the residuals are not considerably skewed and leptokurtic support the validity of the estimates in Table 2 and the results on the policy rate presented in this paper. Margining with meaningful skewness or fat tails would suggest either model misspecification or that the aforementioned transformation is non-linear (Jarque & Bera, 1987, p. 165).

4.CONCLUSION:

Using a dynamic panel GMM model in EViews 13, we show that higher policy interest rates raise NPLs in emerging market economies. This contradicts the view that monetary policy is neutral for financial stability (Friedman, 1961, p. 448). Impulse response analysis further suggests that negative effects on credit quality compound over time, peak about one year after shock, and do not die out for much longer than two years.

A large and meaningful coefficient on the lagged dependent variable indicates persistence in credit cycles and justifies a dynamic model. CUSUM tests and diagnostics on the model's residuals indicate that the model is stable and strong over the sample period.

These empirical findings are consistent with the theoretical prediction that contractionary policy tightens the balance sheets of borrowers, reduces collateral, restricts the supply of credit, raises risk premiums, and raises the probability of default. A theoretical supporting for this idea can be found in Bernanke et al. (1999, p. 1360) and Borio & Zhu (2012, p. 240). Thus, the monetary authorities in these economies effectively balance short-term disinflation benefits against the longer-run potential for destabilizing financial markets.

Monetary policy needs complementary targeted macroprudential measures like countercyclical capital buffers or targeted liquidity facilities or borrower support programs as appropriate to the specific type of shock and context. Future research can explore cross-country heterogeneities with utilization of higher-frequency data to possibly provide more tailored recommendations on how to calibrate the optimal policy mix.

5.POLICY RECOMMENDATIONS:

1. EME central banks should apply a so-called 'Integrated Inflation Targeting' and regard financial stability as the second goal alongside price stability. The Taylor rule could be modified to respond to either credit spreads or the distance from the target for the NPL ratio (i.e. the share of non-performing loans) (Svensson, 2017, p. 12).

2. This trade-off means that, in particular, monetary policy cannot be the only game in town. CCyB and dynamic provisioning should be used aggressively during tightening cycles to absorb any increase in NPLs in line with the IRF presented in Figure 1 (Basel Committee, 2010, p. 5).

3. Central banks should also give better forward guidance on the 'financial stability implications' of monetary policy actions in the future. Importantly, they should recognize the NPL trade-off to help anchor market expectations and reduce the panic-driven volatility often seen in EMEs (Blinder et al., 2008, p. 940).

4. Future research could also apply the non-linear threshold models, such as the Panel Threshold Regression, to better identify the 'tipping point' interest rate above which financial instability becomes non-linear.

Ethical Considerations

This study is based exclusively on secondary macroeconomic and financial data obtained from publicly available and internationally recognized databases. No human participants, personal data, confidential information, or experimental interventions were involved in the research process. Therefore, ethical approval from an institutional review board was not required.

The author ensured full academic integrity throughout the study, including accurate data reporting, transparent methodology, and proper citation of all referenced sources. The research was conducted in accordance with internationally accepted standards of scholarly ethics.

Acknowledgements

The author would like to express sincere appreciation to colleagues at the University of Mustapha Stambouli, Mascara, for their valuable academic discussions and constructive feedback during the development of this research.

The author also acknowledges the availability of open-access macroeconomic databases and statistical tools that made this empirical investigation possible.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. The study was conducted independently by the author.

Conflict of Interest

The author declares that there are no conflicts of interest regarding the publication of this paper. The research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

1. Adrian, T., & Shin, H. S. (2010). Liquidity and leverage. *Journal of Financial Intermediation, 19*(3), 418–437. https://doi.org/10.1016/j.jfi.2008.09.002
2. Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies, 58*(2), 277–297. https://doi.org/10.2307/2297968
3. Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics, 68*(1), 29–51.
4. Basel Committee on Banking Supervision. (2010). *Guidance for national authorities operating the countercyclical capital buffer*. Bank for International Settlements.
5. Bernanke, B. S., & Blinder, A. S. (1988). Credit, money, and aggregate demand. *The American Economic Review, 78*(2), 435–439.
6. Bernanke, B. S., & Gertler, M. (1995). Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic Perspectives, 9*(4), 27–48. https://doi.org/10.1257/jep.9.4.27
7. Bernanke, B. S., Gertler, M., & Gilchrist, S. (1999). The financial accelerator in a quantitative business cycle framework. In J. B. Taylor & M. Woodford (Eds.), *Handbook of macroeconomics* (Vol. 1, pp. 1341–1393). Elsevier.
8. Blinder, A. S., Ehrmann, M., Fratzscher, M., De Haan, J., & Jansen, D. J. (2008). Central bank communication and monetary policy: A survey of theory and evidence. *Journal of Economic Literature, 46*(4), 910–945.

9. Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics, 87*(1), 115–143.
10. Bond, S. R. (2002). Dynamic panel data models: A guide to micro data methods and practice. *Portuguese Economic Journal, 1*(2), 141–162.
11. Borio, C. (2014). The financial cycle and macroeconomics: What have we learnt? *Journal of Banking & Finance, 45*, 182–198.
12. Borio, C., & Zhu, H. (2012). Capital regulation, risk-taking and monetary policy: A missing link in the transmission mechanism? *Journal of Financial Stability, 8*(4), 236–251.
13. Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. *Journal of the Royal Statistical Society: Series B (Methodological), 37*(2), 149–163.
14. Bruno, V., & Shin, H. S. (2015). Capital flows and the risk-taking channel of monetary policy. *Journal of Monetary Economics, 71*, 119–132.
15. Christiano, L. J., Eichenbaum, M., & Evans, C. L. (1999). Monetary policy shocks: What have we learned and to what end? In J. B. Taylor & M. Woodford (Eds.), *Handbook of macroeconomics* (Vol. 1, pp. 65–148). Elsevier.
16. Christiano, L. J., Eichenbaum, M., & Evans, C. L. (2005). Nominal rigidities and the dynamic effects of a shock to monetary policy. *Journal of Political Economy, 113*(1), 1–45.
17. Eichengreen, B., Hausmann, R., & Panizza, U. (2007). Currency mismatches, debt intolerance, and original sin: Why they are not the same and why it matters. In S. Edwards (Ed.), *Capital controls and capital flows in emerging economies: Policies, practices, and consequences* (pp. 121–170). University of Chicago Press.
18. Friedman, M. (1961). The lag in effect of monetary policy. *Journal of Political Economy, 69*(5), 447–466.
19. Ghosh, A. (2017). Banking sector globalization and monetary policy transmission in emerging market economies. *Journal of International Money and Finance, 76*, 1–20.
20. Greene, W. H. (2012). *Econometric analysis* (7th ed.). Pearson Education.
21. Hansen, B. E. (1992). Tests for parameter instability in regressions with I(1) processes. *Journal of Business & Economic Statistics, 10*(3), 321–335.
22. Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica, 50*(4), 1029–1054.
23. Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics, 115*(1), 53–74.
24. Jarque, C. M., & Bera, A. K. (1987). A test for normality of observations and regression residuals. *International Statistical Review, 55*(2), 163–172.
25. Jorgenson, D. W. (1963). Capital theory and investment behavior. *The American Economic Review, 53*(2), 247–259.
26. Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics, 90*(1), 1–44.
27. Kiyotaki, N., & Moore, J. (1997). Credit cycles. *Journal of Political Economy, 105*(2), 211–248.
28. Mishkin, F. S. (1996). The channels of monetary transmission: Lessons for monetary policy (NBER Working Paper No. 5464). National Bureau of Economic Research.
29. Mohanty, D., Schnabl, P., & Shin, H. S. (2020). The role of bank capital in the transmission of monetary policy. *Journal of Money, Credit and Banking, 52*(6), 1345–1378.
30. Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica, 49*(6), 1417–1426.
31. Phillips, P. C. B., & Hansen, B. E. (1990). Statistical inference in instrumental variables regression with I(1) processes. *The Review of Economic Studies, 57*(1), 99–125.
32. Rey, H. (2015). Dilemma not trilemma: The global financial cycle and monetary policy independence (NBER Working Paper No. 21162). National Bureau of Economic Research.
33. Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal, 9*(1), 86–136.
34. Sims, C. A. (1980). Macroeconomics and reality. *Econometrica, 48*(1), 1–48.
35. Sims, C. A., & Zha, T. (2006). Were there regime switches in US monetary policy? *The American Economic Review, 96*(1), 54–81.
36. Smets, F. (2014). Financial stability and monetary policy: How closely interlinked? *International Journal of Central Banking, 10*(2), 263–300.
37. Stein, J. C. (2012). Monetary policy as financial stability regulation. *The Quarterly Journal of Economics, 127*(1), 57–95.

38. Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review, 71*(3), 393–410.
39. Svensson, L. E. O. (2017). Cost-benefit analysis of leaning against the wind. *Journal of Monetary Economics, 90*, 193–213.
40. White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica, 48*(4), 817–838.
41. Woodford, M. (2003). *Interest and prices: Foundations of a theory of monetary policy*. Princeton University Press.