Financial Market Structure and Short-Run Economic Growth Dynamics in Vietnam: Evidence from a Var Analysis

HA THI DOAN TRANG[a], NGUYEN THANH GIANG[b], HA MINH SON[c]
Academy of Finance
Ha Noi
VIETNAM

[a]0009-0009-2600-4847
[b]0009-0008-5513-7748
[c]0009-0004-6964-9702

Abstract: - This study examines the short-run relationship between financial market structure and economic growth in Vietnam using a vector autoregression (VAR) framework. Using annual data for the period 2000 to 2024, the analysis employs a dual-framework strategy combining standard Granger causality tests with the Toda-Yamamoto modified Wald procedure to distinguish short-run predictive dynamics from longer-horizon causal linkages. Standard Granger tests find no statistically significant short-run predictive relationships between financial development indicators and economic growth, while the Toda-Yamamoto procedure detects bidirectional causal linkages at conventional significance levels, indicating that the finance-growth relationship in Vietnam is real but deferred, operating through gradual capital reallocation channels rather than rapid contemporaneous transmission. Impulse response analysis confirms that peak GDP responses to financial shocks are modest, approximately +0.21 percentage points for a credit shock and +0.34 percentage points for a stock market shock, dissipating within four to five years and remaining statistically insignificant throughout. Forecast error variance decomposition shows that own-innovations account for over 96 per cent of short-run output variance at a one-year horizon. With Vietnam's domestic credit-to-GDP ratio exceeding 130 per cent by 2024, the findings suggest that the binding constraint on growth transmission has shifted from financial quantity to financial quality, underscoring the need to prioritise intermediation efficiency over continued quantitative expansion.

Key-Words: - Financial market structure; Economic growth; VAR; Toda-Yamamoto causality; Vietnam
JEL Classification: E44; G21; G15; O16; C32

Received: June 14, 2025. Revised: September 18, 2025. Accepted: December 21, 2025. Published: June 17, 2026.

1 Introduction

The relationship between financial development and economic growth remains a cornerstone of macroeconomic theory and a central concern for policy design. Canonical frameworks posit that a well-functioning financial system promotes growth by mobilising savings, screening investment projects, allocating capital efficiently, and facilitating risk management (Levine, 2005). Despite extensive empirical investigation, the literature remains divided on whether finance exerts consistent growth effects across institutional contexts, and whether a bank-based or market-based financial structure is more conducive to economic expansion. These questions are particularly salient for emerging and transitional economies, where rapid financial deepening often precedes improvements in governance, transparency, and market discipline.

Vietnam provides a compelling and policy-relevant context to revisit these issues. Since the early 2000s, the country has experienced rapid economic growth alongside substantial financial expansion. The banking sector remains the dominant source of external finance, with domestic credit to the private sector rising sharply relative to GDP, while the stock market has expanded in terms of capitalisation and liquidity, indicating a gradual shift toward market-based finance. While Vietnam has achieved notable quantitative financial deepening, qualitative concerns persist regarding the efficiency of financial intermediation. Episodes of credit-driven volatility, asset quality vulnerabilities, and stock market instability raise the question of whether financial expansion has functioned as a stable engine of growth or merely increased in scale without commensurate productivity gains.

Against this backdrop, this paper examines the relationship between financial market structure and economic growth in Vietnam, explicitly distinguishing between bank-based and market-based finance. The study addresses three central research questions: whether developments in domestic bank credit and stock market capitalisation exert statistically significant short-run effects on economic growth; whether short-run predictive causality runs from finance to growth or vice versa; and what is the magnitude and persistence of output responses to shocks originating from banking and equity market channels.

The study makes three interrelated contributions to the finance-growth literature. The first is empirical. Although country-specific VAR analyses of the finance-growth nexus exist for Vietnam (Vo and Nguyen, 2014; Nguyen and Vo, 2020; Ha et al., 2025), none incorporates the full 2000 to 2024 sample period, which encompasses Vietnam's three most structurally significant phases: the rapid financial deepening and stock market boom of 2005 to 2008, the post-crisis tightening and banking sector restructuring of 2011 to 2015, and the COVID-19 shock and subsequent recovery of 2020 to 2024. This extended sample provides a more comprehensive basis for assessing whether Vietnam's financial development has translated into growth transmission.

The second contribution is methodological. Existing VAR-based studies in this context typically apply either standard Granger causality tests on first-differenced systems or VECM-based error correction analysis, but rarely both within a unified framework. This study employs a dual-framework strategy that combines standard Granger causality tests within a first-differenced VAR with the Toda-Yamamoto (1995) modified Wald procedure, which is valid under cointegration and preserves long-run information. The approach allows the study to separately identify short-run predictive dynamics and broader causal linkages operating through slower equilibrium adjustment channels. The co-existence of absent short-run Granger causality and present Toda-Yamamoto causality implies a finance-growth nexus that is real but deferred, operating through gradual capital reallocation mechanisms rather than rapid contemporaneous transmission.

The third contribution is interpretative. A growing strand of research argues that the finance-growth relationship is nonlinear, with positive effects at early stages giving way to diminishing returns once financial depth exceeds an economy-specific threshold (Arcand et al., 2015; Law and Singh, 2014; Samargandi et al., 2015). With Vietnam's domestic credit-to-GDP ratio exceeding 130 per cent by 2024, the findings raise the empirically grounded possibility that Vietnam has entered a zone of diminishing marginal returns to financial deepening, shifting the policy conclusion away from continued scale expansion toward improvements in intermediation quality.

The remainder of the paper is organised as follows. Section 2 reviews the literature and develops the research hypotheses. Section 3 describes the data and econometric methodology. Section 4 presents the empirical results, and Section 5 discusses policy implications and concluding remarks.

2 Literature Review and Research Hypotheses

2.1 Financial Market Structure and Economic Growth: Theoretical Perspectives

The relationship between financial development and economic growth has long occupied a central position in economic theory. Early contributions emphasise the role of financial systems in mobilising savings, allocating capital efficiently, facilitating risk management, and monitoring firms, thereby fostering investment, innovation, and long-term growth (Schumpeter, 1911; Levine, 2005). Within this framework, a key strand of the literature focuses on the distinction between bank-based and market-based systems and how different institutional arrangements shape the finance-growth nexus.

The bank-based view argues that banks play a pivotal role in addressing information asymmetries and enforcing corporate discipline through relationship lending and active monitoring, particularly in economies with weak legal systems and underdeveloped capital markets (Allen and Gale, 2000). The market-based view, by contrast, emphasises the advantages of well-functioning capital markets in promoting risk diversification, price discovery, and corporate governance (Levine and Zervos, 1998). Despite these theoretical distinctions, a growing body of research suggests that the dichotomy between bank-based and market-based systems may be overly simplistic, and that what matters most is the overall quality, depth, and institutional underpinnings of financial intermediation (Beck and Levine, 2002; Levine, 2005).

2.2 Transmission Channels, Nonlinearities, and the "Too Much Finance" Debate

Financial development may influence economic growth through multiple channels. Bank-based finance primarily operates through the credit channel

by easing liquidity constraints and reallocating resources toward productive sectors, though its effectiveness depends critically on credit quality and incentive structures within the banking system. Policy-driven or poorly supervised credit expansion may generate misallocation, asset price bubbles, and financial instability, thereby weakening growth effects (Rajan and Zingales, 1998; Minsky, 1986). Market-based finance operates through equity financing, valuation signals, and governance mechanisms, but in markets characterised by limited depth and institutional investor participation, capitalisation growth may primarily reflect speculative activity rather than productive capital formation (Levine and Zervos, 1998).

A critical development in the post-2010 literature concerns the nonlinear relationship between financial development and growth at high levels of financial depth. Arcand, Berkes, and Panizza (2015) provide influential cross-country evidence that the marginal effect of financial depth on growth turns negative when private sector credit exceeds approximately 100 per cent of GDP. Cecchetti and Kharroubi (2012) document that rapid financial sector growth crowds out real economic activity by diverting skilled labour from productive sectors. Sahay et al. (2015) identify an inverted-U relationship between financial development and growth, while Law and Singh (2014) estimate that the finance-growth relationship becomes negative beyond a credit-to-GDP ratio of approximately 88 per cent. Samargandi, Fidrmuc, and Ghosh (2015) find a similar pattern specifically for middle-income countries, the income group to which Vietnam belongs.

These findings carry direct relevance for Vietnam. With domestic credit reaching approximately 130 per cent of GDP by 2024, well above the thresholds identified in the literature, the marginal growth benefits of further credit expansion are likely to be attenuated. The constraint on growth transmission appears to have shifted from financial quantity to financial quality, a reading consistent with the modest and statistically insignificant short-run results of the present study. The "too much finance" hypothesis also offers a coherent reinterpretation of the Toda-Yamamoto result: the presence of long-run bidirectional causal linkages alongside the absence of strong short-run transmission reflects a scenario in which financial development exerts gradual structural effects whose pace is constrained by institutional weaknesses and the diminishing marginal productivity of credit in a system that has already achieved substantial quantitative depth.

2.3 Evidence from Emerging and Transitional Economies

Empirical evidence from emerging and transitional economies complicates the finance-growth relationship, with many studies finding weak, insignificant, or transitory linkages in the short run, attributed to state-influenced credit allocation, shallow capital markets, and limited institutional investor participation. Within the Vietnamese context, Vo and Nguyen (2014) document weak and unstable short-run relationships using data through 2012, Nguyen and Vo (2020) find similarly inconclusive short-run effects but note a positive long-run association, and Ha et al. (2025) report weak short-run transmission consistent with the present findings. The present study extends this literature by incorporating data through 2024, employing the dual Granger and Toda-Yamamoto framework to reconcile short-run and long-run causal patterns, and interpreting the findings in light of the "too much finance" hypothesis, generating conclusions that are richer and more policy-relevant than those available from earlier analyses.

2.4 Hypotheses Development

Drawing on the theoretical arguments and empirical evidence discussed above, this study formulates three hypotheses reflecting a cautious and context-specific view of the finance-growth relationship in Vietnam.

H1: Bank-based financial development does not exert statistically significant short-run causal effects on economic growth in Vietnam.

H2: Market-based financial development does not exert statistically significant short-run causal effects on economic growth in Vietnam.

H3: Short-run fluctuations in economic growth are predominantly driven by its own innovations rather than by shocks originating from the financial sector.

The expectation of weak or absent short-run causal effects in H1 and H2 is reinforced by the "too much finance" literature, which finds that financial systems operating above critical depth thresholds tend to exhibit attenuated marginal growth responses to further expansion (Arcand et al., 2015; Law and Singh, 2014; Samargandi et al., 2015). H3 is consistent with the prediction that in systems operating beyond the finance-growth optimum, the primary drivers of short-run growth are non-financial factors, including human capital accumulation, trade openness, and structural transformation, rather than financial sector expansion. By testing these hypotheses within a country-specific VAR framework, the study aims to provide nuanced evidence on how financial market structure shapes

growth dynamics in an emerging and transitional economy.

3 Data and Research Methodology

3.1 Data and Variable Construction

This study employs annual time-series data for Vietnam spanning the period 2000 to 2024, capturing the evolution of the country's financial system during the post-reform era. Economic growth is proxied by real GDP measured in constant 2015 U.S. dollars and expressed in natural logarithms. Financial market structure is represented by two core indicators: domestic credit to the private sector as a percentage of GDP (CREDIT) for the bank-based dimension, and stock market capitalisation as a percentage of GDP (MCAP) for the market-based dimension. All variables are sourced from the World Bank's World Development Indicators.

CREDIT and MCAP are quantity-based measures of financial development that reflect the scale of bank intermediation and equity market activity relative to the size of the economy. They do not directly capture the efficiency or institutional dimensions of financial intermediation, which may be equally important for growth transmission at high levels of quantitative depth (Sahay et al., 2015). The choice to focus on these two indicators is driven by data availability, degrees-of-freedom constraints in a 25-observation VAR system, and comparability with the broader empirical literature. Supplementary analysis using efficiency proxies, including the non-performing loan ratio, interest rate spreads, and the stock market turnover ratio, is presented in Appendix C.

3.2 Time-Series Properties and Unit Root Testing

Augmented Dickey-Fuller (ADF) unit root tests confirm that lnGDP, CREDIT, and MCAP are non-stationary in levels but stationary after first differencing, indicating that all variables are integrated of order one, I(1). A related concern pertains to the potential for omitted variable bias, as GDP growth is influenced by macroeconomic determinants such as inflation, investment, and trade openness that are excluded from the three-variable system. Degrees-of-freedom constraints preclude their direct inclusion. This concern is addressed in two ways: the endogenous VAR structure partially absorbs shared macroeconomic dynamics through lagged information sets, and Appendix C provides a directional assessment showing that the two most important omitted variables, investment and trade openness, are positively correlated with both financial development and GDP growth, implying upward bias in the baseline estimates. The absence of significant short-run finance-growth effects in the baseline specification is therefore a conservative finding.

Given the presence of major macroeconomic shocks during the sample period, including the global financial crisis (2008-2009) and the COVID-19 pandemic (2020-2021), the possibility of structural breaks in the data cannot be ruled out. Structural changes may affect both the stationarity properties of the series and the stability of estimated relationships.

While formal structural break tests are constrained by the limited sample size, the analysis partially accounts for this issue through robustness checks across alternative model specifications and lag structures. Nevertheless, the potential presence of structural breaks remains an important caveat when interpreting the results.

3.3 Econometric Framework: VAR Specification

The study adopts a Vector Autoregression (VAR) framework to examine dynamic interactions between financial market structure and economic growth. Let $y_t = (\Delta lnGDP_t, \Delta CREDIT_t, \Delta MCAP_t)$ denote the vector of first-differenced variables. The VAR(p) model takes the form:

$$y_t = c + A\square y_{(t-1)} + A\square y_{(t-2)} + ... + A\square y_{(t-p)} + \varepsilon_t$$

where c is a vector of constants, A_i are coefficient matrices, and ε_t is a vector of reduced-form innovations. With 25 observations and three endogenous variables, the VAR(4) specification leaves only eight degrees of freedom per equation, warranting caution in interpreting coefficient estimates. While AIC selects a lag order of four, SBIC selects one, yielding 20 degrees of freedom per equation. This study adopts a two-model approach: VAR(4) serves as the baseline specification, consistent with AIC, HQIC, and the economic rationale for delayed financial transmission, while VAR(1) serves as the primary robustness alternative. OLS-based VAR estimators are subject to downward bias in finite samples (Nicholls and Pope, 1988), so impulse response functions and variance decomposition results are interpreted as indicative of dynamic patterns rather than precise parameter estimates. Bootstrap confidence intervals are used to partially mitigate this concern.

It is important to note that the empirical analysis is conducted on a relatively small sample of 25 annual observations. This imposes limitations on the degrees of freedom and may affect the reliability of parameter estimates, particularly in higher-order VAR

specifications. As a result, the findings should be interpreted with caution and understood as indicative of general dynamic patterns rather than precise quantitative estimates.

To mitigate small-sample bias, the study adopts a parsimonious modeling strategy, reports results across alternative lag specifications, and employs bootstrap techniques for inference where appropriate.

3.4 Granger Causality Analysis

Standard Granger causality tests assess short-run predictive relationships among economic growth, bank credit, and stock market development using Wald statistics on the joint significance of lagged coefficients (Granger, 1969). Granger causality reflects predictive content within a specific model and sample, not structural economic causation; rejecting it does not preclude economic mechanisms operating over longer horizons or through channels not captured by the annual lag structure.

When variables are cointegrated, Wald statistics applied to first-differenced VARs do not follow standard asymptotic distributions, potentially generating size distortions (Toda and Yamamoto, 1995). To address this, the study also employs the modified Wald procedure of Toda and Yamamoto (1995), which estimates a levels VAR of order k + d_max and applies the Wald test only to the first k coefficient matrices. With k = 1 (SBIC) and d_max = 1, an augmented VAR(2) in levels is estimated. This approach is particularly appropriate given the cointegration evidence in Section 4.2, and allows the study to distinguish between short-run predictive dynamics and broader causal linkages operating through slower equilibrium adjustment channels.

3.5 Impulse Response Functions

Impulse response functions trace the response of economic growth to one-standard-deviation innovations in bank credit or stock market capitalisation. The Cholesky decomposition is applied with the ordering (ΔlnGDP, ΔCREDIT, ΔMCAP), reflecting the assumption that output responds contemporaneously to financial shocks while financial variables adjust with a lag (Sims, 1980). All six Cholesky orderings are compared in Appendix B. Peak impulse responses range from +0.18 to +0.24 percentage points for the credit shock and from +0.28 to +0.37 percentage points for the equity shock across orderings, and no ordering yields statistically significant responses at any horizon, partly because residual correlations between VAR innovations are all below 0.15 in absolute value (Table B4).

3.6 Forecast Error Variance Decomposition and Summary of Empirical Strategy

Forecast error variance decomposition partitions the variance of the GDP growth forecast error into components attributable to own-innovations and to shocks in CREDIT and MCAP. A low contribution of financial shocks would suggest that short-run growth fluctuations are driven primarily by the internal dynamics of the real economy rather than by financial sector disturbances. The overall empirical strategy proceeds sequentially through unit root testing, Johansen cointegration analysis, VAR estimation, standard and Toda-Yamamoto Granger causality testing, impulse response and variance decomposition analysis, and systematic robustness checks across lag orders and Cholesky orderings, with supplementary efficiency indicator analysis provided in the appendices.

4 Empirical Results

4.1 Stationarity and Lag Selection

ADF unit root tests confirm that lnGDP, CREDIT, and MCAP are non-stationary in levels but stationary after first differencing, implying integration of order one, I(1). The analysis proceeds using the first-differenced series ΔlnGDP, ΔCREDIT, and ΔMCAP (Table 1).

Table 1. Augmented Dickey-Fuller Unit Root Test Results

Variable	Series Form	Conclusion
lnGDP	Level	Non-stationary
lnGDP	First difference	Stationary
CREDIT	Level	Non-stationary
CREDIT	First difference	Stationary
MCAP	Level	Non-stationary
MCAP	First difference	Stationary

Notes: ADF tests performed with constant and linear trend. All variables become stationary after first differencing, confirming I(1).

Source: Authors' calculations based on World Bank WDI data.

Lag length selection results (Table 2) reveal a divergence between criteria. SBIC recommends a lag order of one, while AIC, HQIC, and FPE select four. This study adopts a two-model approach: VAR(4) as the baseline and VAR(1) as the primary robustness alternative (Section 4.6). All characteristic roots of the

VAR(4) system lie within the unit circle, confirming dynamic stability.

Table 2. Lag Length Selection Results for the VAR Model

Lag	Log-Lik.	LR	FPE	AIC	HQIC	SBIC
0	−161.753	n.a.	1309.45	15.6908	15.7232	15.840
1	−81.522	160.46	1.50288	8.90689	9.03642	9.504*
2	−72.303	18.438	1.57122	8.88604	9.11273	9.931
3	−56.203	32.201	0.9487	8.20979	8.53363	9.702
4	−42.927	26.552*	0.9189*	7.8025*	8.2235*	9.742

Notes: Asterisk (*) indicates lag order selected by the corresponding criterion. VAR(4) leaves 8 degrees of freedom per equation; VAR(1) leaves 20.

Source: Authors' calculations using Stata 15.1.

4.2 Cointegration Analysis

The Johansen (1988) cointegration procedure was applied with the lag order set to one, consistent with SBIC. Both the trace statistic and the maximum eigenvalue statistic indicate the presence of one cointegrating vector at the 5 per cent significance level (Table 3), suggesting that real GDP, credit, and stock market capitalisation share a long-run equilibrium relationship over the sample period.

Table 3. Johansen Cointegration Test Results

Null Hypothesis	Trace Statistic	CV 5%	Max-Eigen Statistic	CV 5%
r = 0	45.234**	29.68	26.667**	20.97
r at most 1	18.567	15.41	13.444	14.07
r at most 2	5.123	3.76	4.889	3.76

Notes: ** denotes rejection at the 5% significance level. Critical values follow MacKinnon, Haug, and Michelis (1999). Tests performed with constant in the cointegrating equation, lag order = 1.

Source: Authors' calculations using Stata 15.1.

While the Johansen test suggests the presence of a cointegrating relationship, this evidence should be interpreted with caution given the small sample size and the potential for structural breaks over the study period. In small samples, Johansen procedures are known to exhibit size distortions and may over-reject the null of no cointegration (Haug, 1996; Gonzalo and Pitarakis, 1999).

Given these limitations, and considering the study's primary focus on short-run dynamics, the baseline specification proceeds with a VAR in first differences. To ensure that long-run information is not entirely discarded, the Toda-Yamamoto (1995) approach is additionally employed as a robustness strategy, as it allows valid inference regardless of the integration and cointegration properties of the system.

This combined approach enables the analysis to remain robust to potential misspecification of the long-run structure while maintaining a clear focus on short-run transmission mechanisms.

4.3 Granger Causality Analysis

4.3.1 Standard Granger Causality Tests

Table 4. Standard Granger Causality Tests (VAR(4) in First Differences)

Dependent Variable	Excluded Variable	Chi-sq.	df	p-value	Conclusion
ΔlnGDP	ΔCREDIT	0.130	1	0.718	No causality
ΔlnGDP	ΔMCAP	2.303	1	0.129	No causality
ΔlnGDP	ALL financial	2.746	2	0.253	No causality
ΔCREDIT	ΔlnGDP	0.066	1	0.797	No causality
ΔCREDIT	ΔMCAP	1.792	1	0.181	No causality
ΔMCAP	ΔlnGDP	0.192	1	0.661	No causality
ΔMCAP	ΔCREDIT	0.095	1	0.758	No causality

Notes: Wald statistics on joint significance of lagged coefficients in the VAR(4) system. All variables are in first differences.

Source: Authors' calculations using Stata 15.1.

The standard Granger tests reveal no statistically significant short-run predictive relationships in either direction, consistent with Hypotheses H1 and H2. Three caveats apply. First, this finding is sample-specific; it does not preclude economic linkages operating through long-run capital accumulation and productivity channels. Second, Granger tests have limited power in small samples, so the result is best

understood as insufficient evidence for short-run predictability rather than evidence for the absence of a relationship. Third, the first-differenced VAR discards long-run information by construction, which is recovered through the Toda-Yamamoto procedure below.

4.3.2 Toda-Yamamoto Modified Wald Test

Table 5. Toda-Yamamoto Modified Wald Test for Granger Non-Causality

Null Hypothesis	Chi-sq.	p-value	Decision
CREDIT does not Granger-cause lnGDP	5.234	0.022**	Reject
MCAP does not Granger-cause lnGDP	3.567	0.059*	Reject
lnGDP does not Granger-cause CREDIT	4.892	0.027**	Reject
lnGDP does not Granger-cause MCAP	6.123	0.013**	Reject

Notes: ** and * denote rejection at 5% and 10% significance levels, respectively. Augmented VAR(2) estimated in levels; k = 1, d_max = 1. Wald tests applied to lag-1 coefficients only.

Source: Authors' calculations using Stata 15.1.

The Toda-Yamamoto results contrast markedly with the standard Granger findings. Both CREDIT and MCAP are found to Granger-cause real output, with CREDIT significant at 5 per cent and MCAP at 10 per cent. Significant reverse causality from growth to both financial variables is also detected, indicating a bidirectional relationship between the real and financial sectors.

4.3.3 Reconciling the Two Sets of Results

The divergence between the standard Granger causality results and the Toda-Yamamoto findings reflects differences in the underlying information sets. The first-differenced VAR captures short-run predictive dynamics, while the Toda-Yamamoto procedure, estimated in levels, retains low-frequency information embedded in the data.

The evidence therefore suggests the presence of longer-horizon predictive relationships between financial development and economic growth, although these should not be interpreted as definitive proof of structural causality. Rather, the results are consistent with the possibility that financial development influences growth through gradual and potentially delayed transmission channels that are not captured within short-run specifications.

4.4 Impulse Response Functions

Impulse response functions trace the dynamic response of real GDP growth to one-standard-deviation structural shocks from bank credit and stock market capitalisation within the estimated VAR(4) system. Key quantitative features are summarised in Table 6. Figure 1 presents the full impulse responses with 95 per cent bootstrap confidence intervals (1,000 replications).

Table 6. Summary of Impulse Response Characteristics

Shock Source	Shock Size	Peak GDP Response	Year of Peak	Years to Zero	Statistically Significant?
ΔCREDIT	7.6 pp of GDP	+0.21 pp	Year 3	Year 5	No
ΔMCAP	13.4 pp of GDP	+0.34 pp	Year 2	Year 4	No

Notes: pp = percentage points. Peak response is maximum absolute impulse response of ΔlnGDP across the 10-year horizon. Statistical significance assessed via 95% bootstrap confidence intervals (1,000 replications).

Source: Authors' estimation from VAR(4) model.

A one-standard-deviation credit shock generates a peak GDP growth response of +0.21 percentage points in year three, with the effect dissipating by year five. The initial response in year one is negligible at +0.04 percentage points. A one-standard-deviation equity market shock produces a slightly larger peak of +0.34 percentage points in year two, turning marginally negative by year four before fading entirely. In both cases, 95 per cent bootstrap confidence intervals encompass zero throughout the ten-year horizon, confirming that neither financial channel generates a statistically significant short-run growth response. The faster peak and larger initial magnitude of the equity market response is consistent with the greater speed of information transmission through market prices relative to bank lending. Both responses decay within four to five years, and the wide confidence intervals in this small-sample setting caution against precise structural interpretation of the point estimates.

4.5 Forecast Error Variance Decomposition

Table 7. Forecast Error Variance Decomposition of ΔlnGDP

Forecast Horizon (Years)	Own Innovation (ΔlnGDP)	Bank Credit (ΔCREDIT)	Stock Market (ΔMCAP)
1	96.2%	2.8%	1.0%
2	89.4%	5.3%	5.3%
4	82.1%	8.7%	9.2%
6	79.3%	10.1%	10.6%
8	77.8%	11.2%	11.0%
10	77.1%	11.6%	11.3%

Notes: Cholesky factorisation with ordering (ΔlnGDP, ΔCREDIT, ΔMCAP). Rows sum to 100% subject to rounding.

Source: Authors' estimation from VAR(4) model.

Own-innovations account for 96.2 per cent of GDP growth variance at the one-year horizon, declining gradually to 77.1 per cent at horizon ten as the combined financial contribution rises from 3.8 to 22.9 per cent. This gradual accumulation is consistent with the Toda-Yamamoto evidence of long-run causal linkages, while the continued dominance of own-innovations confirms the secondary role of financial shocks in the short run. The contributions of CREDIT and MCAP are broadly symmetric from horizon four onwards, ranging between 8.7 and 11.6 per cent and between 9.2 and 11.3 per cent respectively, implying that neither financial channel exerts a clearly dominant influence on output dynamics.

Table 8. Forecast Error Variance Decomposition of ΔCREDIT and ΔMCAP

Panel A: Dependent Variable = ΔCREDIT

Horizon	ΔlnGDP	ΔCREDIT (own)	ΔMCAP
1	0.7%	99.3%	0.0%
4	8.3%	88.2%	3.5%
8	13.1%	81.4%	5.5%
10	14.2%	80.1%	5.7%

Panel B: Dependent Variable = ΔMCAP

Horizon	ΔlnGDP	ΔCREDIT	ΔMCAP (own)
1	1.9%	4.3%	93.8%
4	7.4%	8.1%	84.5%
8	11.8%	9.2%	79.0%
10	12.6%	9.5%	77.9%

Notes: Same Cholesky identification scheme as Table 7.

Source: Authors' estimation from VAR(4) model.

By horizon ten, GDP growth shocks account for 14.2 per cent of credit variance and 12.6 per cent of equity market variance, consistent with the Toda-Yamamoto evidence of reverse causality and a supply-following pattern of financial development in Vietnam.

4.6 Robustness: VAR(1) versus VAR(4)

Table 9. Comparison of VAR(1) and VAR(4): Diagnostics and Granger Causality

Indicator	VAR(4) Baseline	VAR(1) SBIC
Degrees of freedom per equation	8	20
All eigenvalues inside unit circle	Yes	Yes
LM autocorrelation test (p-value)	0.189	0.214
Jarque-Bera normality (p-value)	0.128	0.153
ΔCREDIT to ΔlnGDP (p-value)	0.718	0.682
ΔMCAP to ΔlnGDP (p-value)	0.129	0.174
ΔlnGDP to ΔCREDIT (p-value)	0.797	0.721
ΔlnGDP to ΔMCAP (p-value)	0.661	0.589

Notes: Granger causality p-values from Wald tests on joint significance of lagged coefficients. Both models pass all stability and residual diagnostic tests.

Source: Authors' calculations using Stata 15.1.

The main findings are fully consistent across VAR(4) and VAR(1). No standard Granger causality is detected in either specification, confirming that the core conclusions are not an artefact of the chosen lag structure. A supplementary VAR(2) check also yields qualitatively consistent results, with the lowest p-value of 0.112 recorded for ΔMCAP to ΔlnGDP.

5 Discussion and Policy Implications

5.1 Discussion of Empirical Findings

The empirical evidence from the VAR(4) framework consistently points to the absence of statistically detectable short-run predictive relationships between financial development indicators and economic growth in Vietnam. This finding requires careful qualification. The non-significance of standard Granger tests reflects a specific claim, namely that financial variables do not improve the short-run forecast of GDP growth beyond information already contained in its own lags, rather than a general claim that financial development is economically irrelevant. The Toda-Yamamoto analysis reveals that when long-run information is preserved, bidirectional causal linkages emerge at conventional significance levels, suggesting that the finance-growth relationship in Vietnam is real but deferred, operating through channels with longer transmission lags than those captured by the first-differenced VAR.

The quantitative evidence underscores the limited short-run role of financial shocks. At the one-year horizon, own-innovations account for 96.2 per cent of GDP growth variance, with bank credit and stock market shocks contributing only 2.8 per cent and 1.0 per cent respectively. The peak impulse response to a credit shock is +0.21 percentage points in year three, while the peak response to an equity market shock is +0.34 percentage points in year two. Both magnitudes dissipate within four to five years and remain statistically insignificant throughout, reflecting structural constraints in Vietnam's financial system. The banking sector continues to allocate credit in a context shaped by policy priorities and risk aversion rather than by productivity-based criteria, while the stock market remains limited by shallow institutional participation, high volatility, and weaknesses in corporate governance.

These results can be interpreted in light of the "too much finance" debate. Vietnam's domestic credit-to-GDP ratio reached approximately 130 per cent by 2024, substantially exceeding the thresholds beyond which Arcand et al. (2015) and Law and Singh (2014) identify significant attenuation of growth effects. The modest short-run impulse responses are consistent with a financial system that has transitioned from a quantity-constrained to a quality-constrained growth regime, in which the binding constraint is no longer the availability of finance but the efficiency with which it is allocated to productive uses. The Toda-Yamamoto evidence of gradual long-run causal linkages further supports this reading: the finance-growth nexus is not absent but deferred, operating through slowly unfolding capital reallocation and productivity channels whose pace is constrained by institutional weaknesses and the diminishing marginal productivity of credit at current levels of financial depth.

The small sample size remains an important constraint of the analysis. With only 25 annual observations, the statistical power of the tests is limited, and the absence of significant short-run relationships should be interpreted as a lack of strong evidence rather than definitive evidence of absence. This limitation is common in country-specific time-series studies and underscores the need for cautious interpretation of the results.

5.2 Policy Implications

Several policy implications follow from the findings. First, policies aimed primarily at expanding the scale of financial markets are likely to yield limited growth dividends in the absence of improvements in intermediation quality. Continued rapid credit growth, if not accompanied by stronger risk assessment, improved governance, and effective monitoring, is unlikely to generate sustained economic benefits. Policymakers should shift emphasis toward enhancing the efficiency and allocation quality of bank credit by strengthening prudential regulation, reducing policy-driven distortions, and promoting market-based lending practices.

Second, the limited short-run impact of stock market development highlights the need to deepen and stabilise capital markets. Improving disclosure standards, strengthening investor protection, and encouraging greater institutional investor participation could enhance the role of equity markets in supporting productive investment. Without such reforms, growth in market capitalisation may continue to reflect speculative activity rather than genuine improvements in capital allocation.

Third, with Vietnam's credit-to-GDP ratio well above international "too much finance" thresholds, the priority for financial sector reform should be quality improvement rather than further scale expansion. This is consistent with Vietnam's Financial Sector Strategy to 2030 (Ministry of Finance of Vietnam, 2023), which emphasises reducing excessive reliance on bank credit and fostering deeper, more efficient capital markets. More broadly, financial reforms must be complemented by improvements in legal enforcement, corporate governance, and the overall business environment, as financial deepening alone is unlikely to serve as a reliable engine of growth in the absence of these supporting institutional conditions.

5.3 Limitations and Directions for Future Research

Several limitations of the present study merit acknowledgement. The 25-observation annual sample constrains both the model's complexity and the range of variables that can be simultaneously included, and the likely direction of omitted variable bias is upward, suggesting that the true short-run finance-growth coefficients are smaller than estimated. The financial development indicators, CREDIT and MCAP, measure quantity rather than quality of intermediation; future research should incorporate efficiency dimensions directly through composite indices or threshold specifications that allow the finance-growth relationship to vary with intermediation quality (Cihak et al., 2012; Sahay et al., 2015). Extending the analysis to higher-frequency data, when sufficient quarterly observations become available, would allow more precise identification of long-run adjustment channels. Comparative panel analysis incorporating structurally similar ASEAN economies would also help determine whether the deferred finance-growth pattern documented here reflects Vietnam-specific features or a broader characteristic of bank-dominated transitional financial systems.

Future research should explicitly incorporate structural break tests, such as Zivot-Andrews or Bai-Perron procedures, to better account for regime shifts associated with major economic shocks.

5.4 Concluding Remarks

Vietnam's financial system is best characterised as transitional, with both bank-based and market-based components expanding in scale while remaining limited in their short-run growth-enhancing capacity. The finance-growth nexus is real but deferred: causal linkages are detectable when long-run information is preserved, yet they do not manifest as rapid short-run transmission. Policy efforts should accordingly prioritise the quality, efficiency, and institutional underpinnings of financial intermediation rather than the continued expansion of financial aggregates. Reorienting financial development toward these objectives provides the more credible path toward sustainable and productivity-driven economic growth in Vietnam over the longer term.

6 Conclusion

This study investigates the short-run relationship between financial market structure and economic growth in Vietnam within a VAR(4) framework, with particular attention to the roles of bank-based and market-based finance. Within the first-differenced VAR framework, standard Granger causality tests find no statistically significant short-run predictive relationships between financial development indicators and economic growth, indicating that innovations in bank credit and equity market capitalisation do not reliably forecast GDP growth fluctuations over short horizons in the available 25-observation sample. This result reflects the limited short-run transmission intensity of Vietnam's financial system rather than the absence of any finance-growth relationship. The Toda-Yamamoto procedure, which preserves long-run information, detects bidirectional causal linkages at conventional significance levels, consistent with a finance-growth nexus that operates through gradual capital reallocation and equilibrium adjustment rather than through rapid contemporaneous impulses.

Impulse response analysis confirms that peak GDP responses to financial shocks are modest in magnitude, below 0.35 percentage points, and statistically insignificant throughout the forecast horizon. Forecast error variance decomposition reveals that own-innovations account for over 77 per cent of output variance even at a ten-year horizon, with the combined financial contribution growing gradually from under 4 per cent in year one to approximately 23 per cent at year ten. These quantitative results confirm that short-run growth fluctuations in Vietnam are driven primarily by their own dynamics, with financial shocks playing a limited and gradually accumulating supplementary role.

Interpreted in light of the "too much finance" literature, and noting that Vietnam's credit-to-GDP ratio exceeded 130 per cent by 2024, the evidence is consistent with a financial system that has entered a zone of diminishing marginal returns to quantitative financial deepening. The inference is not that financial development is unproductive, but that its growth benefits are likely to materialise over longer time horizons and under qualitatively improved intermediation conditions. Rather than supporting the dominance of either a bank-based or a market-based model, the evidence points to a transitional financial structure in which both channels have expanded in scale while remaining constrained in intermediation efficiency.

From a policy perspective, the findings underscore the importance of moving beyond strategies that prioritise the scale of financial development. Improving the quality of financial intermediation, strengthening institutional frameworks, and fostering balanced coordination between banks and capital markets are critical for enhancing the role of finance in supporting sustainable, productivity-driven growth.

This conclusion is directly aligned with Vietnam's Financial Sector Strategy to 2030 and represents the central practical implication of the empirical evidence presented in this study.

References:

[1] Allen, F., and Gale, D. (2000). Comparing financial systems. MIT Press.

[2] Arcand, J. L., Berkes, E., and Panizza, U. (2015). Too much finance? Journal of Economic Growth, 20(2), 105-148.

[3] Beck, T., and Levine, R. (2002). Industry growth and capital allocation: Does having a market- or bank-based financial system matter? Journal of Financial Economics, 64(2), 147-180.

[4] Beck, T., Levine, R., and Loayza, N. (2000). Finance and the sources of growth. Journal of Financial Economics, 58(1-2), 261-300.

[5] Cecchetti, S. G., and Kharroubi, E. (2012). Reassessing the impact of finance on growth. BIS Working Paper No. 381. Bank for International Settlements.

[6] Cihak, M., Demirguc-Kunt, A., Feyen, E., and Levine, R. (2012). Benchmarking financial systems around the world. World Bank Policy Research Working Paper No. 6175.

[7] Dickey, D. A., and Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. Journal of the American Statistical Association, 74(366), 427-431.

[8] Gonzalo, J., and Pitarakis, J.-Y. (1999). Dimensionality effect in cointegration analysis. In R. F. Engle and H. White (Eds.), Cointegration, causality, and forecasting (pp. 212-229). Oxford University Press.

[9] Granger, C. W. J. (1969). Investigating causal relations by econometric models and cross-spectral methods. Econometrica, 37(3), 424-438.

[10] Ha Thi Doan Trang, Ha Minh Son, Nguyen Thanh Giang, and Ha Minh Dung. (2025). Impacts of financial markets on economic growth in Vietnam. WSEAS Transactions on Business and Economics, 22, 1825-1838.

[11] Haug, A. A. (1996). Tests for cointegration: A Monte Carlo comparison. Journal of Econometrics, 71(1-2), 89-115.

[12] International Monetary Fund. (2023). Vietnam: Financial system stability assessment. IMF Country Report No. 23/371.

[13] Johansen, S. (1988). Statistical analysis of cointegration vectors. Journal of Economic Dynamics and Control, 12(2-3), 231-254.

[14] Kilian, L., and Lutkepohl, H. (2017). Structural vector autoregressive analysis. Cambridge University Press.

[15] Law, S. H., and Singh, N. (2014). Does too much finance harm economic growth? Journal of Banking and Finance, 41, 36-44.

[16] Levine, R. (2002). Bank-based or market-based financial systems: Which is better? Journal of Financial Intermediation, 11(4), 398-428.

[17] Levine, R. (2005). Finance and growth: Theory and evidence. In P. Aghion and S. N. Durlauf (Eds.), Handbook of economic growth (Vol. 1A, pp. 865-934). Elsevier.

[18] Levine, R., and Zervos, S. (1998). Stock markets, banks, and economic growth. American Economic Review, 88(3), 537-558.

[19] Lutkepohl, H. (2005). New introduction to multiple time series analysis. Springer.

[20] MacKinnon, J. G., Haug, A. A., and Michelis, L. (1999). Numerical distribution functions of likelihood ratio tests for cointegration. Journal of Applied Econometrics, 14(5), 563-577.

[21] Ministry of Finance of Vietnam. (2023). Vietnam capital market development strategy to 2030 (Decision No. 1726/QD-TTg). Hanoi.

[22] Minsky, H. P. (1986). Stabilizing an unstable economy. Yale University Press.

[23] Nguyen, T. T., and Vo, D. H. (2020). Financial development, financial structure and economic growth in emerging markets: Evidence from Vietnam. Journal of Asian Finance, Economics and Business, 7(2), 89-98.

[24] Nicholls, D. F., and Pope, A. L. (1988). Bias in the estimation of multivariate autoregressions. Australian Journal of Statistics, 30(1), 296-309.

[25] Rajan, R. G., and Zingales, L. (1998). Financial dependence and growth. American Economic Review, 88(3), 559-586.

[26] Sahay, R., Cihak, M., N'Diaye, P., Barajas, A., Bi, R., Ayala, D., and Yousefi, S. R. (2015). Rethinking financial deepening: Stability and growth in emerging markets.

IMF Staff Discussion Note SDN/15/08. International Monetary Fund.

[27] Samargandi, N., Fidrmuc, J., and Ghosh, S. (2015). Is the relationship between financial development and economic growth monotonic? Evidence from a sample of middle-income countries. World Development, 68, 66-81.

[28] Schumpeter, J. A. (1911). The theory of economic development. Harvard University Press.

[29] Sims, C. A. (1980). Macroeconomics and reality. Econometrica, 48(1), 1-48.

[30] Toda, H. Y., and Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. Journal of Econometrics, 66(1-2), 225-250.

[31] Vo, X. V., and Nguyen, T. C. (2014). Financial development and economic growth in Vietnam. Journal of Economics and Development, 16(3), 5-19.

[32] World Bank. (2022). Vietnam financial sector assessment: Structure and vulnerabilities. World Bank.

[33] World Bank. (2024). World Development Indicators. Retrieved from https://databank.worldbank.org/source/world-development-indicators

Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

The authors contributed in the present research, at all stages from the formulation of the problem to the final findings and solution.

Sources of Funding for Research Presented in a Scientific Article or Scientific Article Itself

No funding was received for conducting this study.

Conflict of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

APPENDIX A: Data Description and Sources

Table A1. Annual Data on Economic Growth and Financial Development in Vietnam, 2000 to 2024

Year	Real GDP (constant 2015 USD, billion)	Domestic Credit to Private Sector (% GDP)	Stock Market Capitalisation (% GDP)
2000	93.53	35.26	0.28
2001	99.32	39.29	0.51
2002	105.60	43.13	0.38
2003	112.88	48.37	0.27
2004	121.39	58.72	0.67
2005	130.55	60.47	10.00
2006	139.66	65.36	22.70
2007	149.62	85.64	43.00
2008	158.09	82.87	12.47
2009	166.62	103.32	31.42
2010	177.32	90.35	25.04
2011	188.69	79.94	15.04
2012	199.08	75.55	18.77
2013	210.14	77.56	21.12
2014	223.63	80.00	22.46
2015	239.26	90.40	24.55
2016	255.26	98.86	28.48
2017	272.98	103.97	44.54
2018	293.36	105.28	42.78
2019	314.95	108.03	44.81
2020	323.97	115.53	53.66
2021	332.25	124.28	76.07
2022	360.61	124.96	41.15
2023	378.88	128.00	43.29
2024	405.74	130.00	42.95

Notes: 2024 values are provisional. GDP values are in billion USD for readability. Source: World Bank WDI (2024 update) and State Bank of Vietnam publications.

APPENDIX B: Robustness to Alternative Cholesky Orderings

B.1 Overview of Alternative Orderings

With three variables, there are 3! = 6 possible Cholesky orderings. Table B1 lists all orderings and their economic interpretations.

Table B1. All Cholesky Orderings and Their Economic Interpretations

No.	Sequence	Contemporaneous Assumption
I (Baseline)	ΔlnGDP, ΔCREDIT, ΔMCAP	GDP responds to all shocks; credit responds to equity but not to GDP (baseline specification)
II	ΔlnGDP, ΔMCAP, ΔCREDIT	GDP responds to all shocks; equity responds to credit but not to GDP
III	ΔCREDIT, ΔlnGDP, ΔMCAP	Credit is causally prior; GDP responds to equity but not to credit (bank-led scenario)
IV	ΔCREDIT, ΔMCAP, ΔlnGDP	Credit is causally prior; equity responds to GDP; GDP responds to neither contemporaneously
V	ΔMCAP, ΔlnGDP, ΔCREDIT	Equity is causally prior (market-led scenario)
VI	ΔMCAP, ΔCREDIT, ΔlnGDP	Equity responds to all shocks; GDP responds to neither contemporaneously

Notes: The variable listed first may affect all others within the same period; the variable listed last does not contemporaneously affect any other variable.

B.2 Peak IRF Responses Across All Orderings

Table B2. Peak IRF of ΔlnGDP to Financial Shocks Across All Six Orderings

Ordering	Credit Shock (pp)	Year of Peak	Equity Shock (pp)	Year of Peak	Any Horizon Significant?
I (Baseline)	+0.21	Year 3	+0.34	Year 2	No
II	+0.19	Year 3	+0.31	Year 2	No
III	+0.24	Year 3	+0.28	Year 2	No
IV	+0.22	Year 4	+0.29	Year 2	No
V	+0.18	Year 3	+0.37	Year 1	No
VI	+0.20	Year 3	+0.35	Year 1	No

Notes: pp = percentage points. Statistical significance assessed via 95% bootstrap confidence intervals (1,000 replications). No ordering yields statistically significant GDP responses at any forecast horizon.

B.3 FEVD Comparison Across Key Orderings

Table B3. Forecast Error Variance Decomposition of ΔlnGDP at Selected Horizons

Horiz.	Own I	Cred I	Eq I	Own III	Cred III	Eq III	Own V	Cred V	Eq V
1	96.2%	2.8%	1.0%	93.7%	5.1%	1.2%	94.8%	1.4%	3.8%
4	82.1%	8.7%	9.2%	80.3%	10.2%	9.5%	81.6%	7.8%	10.6%
10	77.1%	11.6%	11.3%	75.8%	12.9%	11.3%	76.4%	10.3%	13.3%

Notes: Own = share of variance explained by own-innovations. I = Ordering I (baseline); III = credit-first; V = equity-first. Combined financial share at horizon 10 ranges from 22.9% (Ordering I) to 24.2% (Ordering III), a difference well within confidence bands.

B.4 Residual Correlation Matrix

Table B4. Residual Correlation Matrix from Baseline VAR(4)

	ΔCREDIT	ΔMCAP
ΔlnGDP	0.087	0.143
ΔCREDIT	n.a.	0.112

Notes: Pearson correlations between VAR(4) residuals. All off-diagonal entries are below 0.15, confirming that the choice of Cholesky ordering has limited quantitative impact in this application.

The near-invariance of results across all six orderings has an economically meaningful implication. In the present application, contemporaneous correlation between VAR residuals is small, meaning that real GDP growth and financial variables do not move strongly together within the same year. This is consistent with a sluggish transmission environment in which the links between financial development and real activity operate with meaningful lags, reinforcing the broader conclusion that Vietnam's financial system has not yet developed the high-frequency transmission channels characteristic of more mature market economies.

APPENDIX C: Financial Efficiency Proxies and Omitted Variable Robustness

C.1 Financial Efficiency Indicators: Descriptive Evidence

Table C1 presents available annual data on three supplementary efficiency-oriented indicators: the non-performing loan ratio (NPL), the interest rate spread (IRS, defined as the difference between lending and deposit rates), and the stock market turnover ratio (TURN, defined as the value of shares traded divided by market capitalisation).

Table C1. Financial Efficiency Indicators: Vietnam, Selected Years

Year	NPL Ratio (%)	Interest Rate Spread (pp)	Stock Market Turnover Ratio (%)
2000	13.2	4.8	3.1
2005	7.7	3.6	8.4
2008	3.5	5.1	62.3
2011	3.4	5.8	38.7
2013	4.7	4.2	31.4
2015	2.9	3.1	42.6
2018	2.4	2.7	54.8
2020	1.9	2.9	61.2
2022	2.1	3.4	48.3
2024	4.8	3.1	43.7

Sources: NPL ratio from State Bank of Vietnam Annual Reports and IMF Financial Soundness Indicators; interest rate spread from World Bank WDI; turnover ratio from World Federation of Exchanges and HOSE/HNX Annual Reports. 2024 figures are provisional.

The persistence of elevated interest rate spreads throughout the sample, ranging from 2.7 to 5.8 percentage points, indicates that the banking system has not operated as an efficient intermediary even as credit volumes expanded substantially. The deterioration of reported NPL ratios to 4.8 per cent by 2024 after years of apparent improvement suggests that the earlier decline was partly attributable to regulatory forbearance rather than genuine improvement in lending discipline. The high but volatile turnover ratio reflects a market dominated by short-term speculative trading rather than long-term value-based investment. Taken together, these efficiency indicators support the paper's central argument that quantity-based financial expansion has not been matched by commensurate improvements in the quality and efficiency of capital allocation.

C.2 Bivariate VAR Robustness Checks

Table C2. Bivariate VAR Granger Causality Tests

Null Hypothesis	Chi-sq.	p-value	Consistent with Trivariate?
ΔCREDIT does not Granger-cause ΔlnGDP	0.184	0.668	Yes
ΔlnGDP does not Granger-cause ΔCREDIT	0.291	0.589	Yes
ΔMCAP does not Granger-cause ΔlnGDP	1.847	0.174	Yes
ΔlnGDP does not Granger-cause ΔMCAP	0.623	0.430	Yes

Notes: Both bivariate systems estimated at lag order 1 (SBIC). Results are fully consistent with the three-variable system.

The bivariate results confirm that the absence of short-run predictive relationships is not an artefact of cross-variable dynamics or the three-variable model structure. It reflects a genuine feature of the pairwise data relationships between financial development indicators and GDP growth in Vietnam over the sample period.

C.3 Direction of Likely Omitted Variable Bias

Table C3. Direction of Likely Omitted Variable Bias

Omitted Variable	Correlation with CREDIT and MCAP	Correlation with ΔlnGDP	Direction of Bias on Finance Coefficients
Gross fixed capital formation	Positive: credit expansion co-moves with investment cycles	Positive: investment drives growth	Upward: true finance coefficient would be smaller if controlled
Inflation	Mixed: negative in tightening phases, positive in credit booms	Negative at high levels	Ambiguous direction
Trade openness	Weakly positive: financial deepening tends to accompany trade integration	Positive: export-led growth	Upward: true finance coefficient would be smaller if controlled

Notes: Directional assessments based on Vietnam macroeconomic cycles and cross-country evidence from Levine (2005) and Sahay et al. (2015).

The directional analysis reveals a consistent pattern. The two most important omitted variables, investment and trade openness, are positively correlated with both financial development and GDP growth, implying upward omitted variable bias in the baseline VAR. The fact that the baseline VAR already finds no significant short-run finance-growth effects therefore constitutes a conservative finding: controlling for these variables would yield finance-growth coefficients that are smaller, not larger, further strengthening the robustness of the paper's core conclusions.