

FINANCIAL STRESS SPILLOVERS TO VIET NAM'S FINANCIAL MARKETS: EVIDENCE FROM A FOURIER QUANTILE-ON-QUANTILE APPROACH

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ABSTRACT

This study looks into the nonlinear and horizon-dependent influences of global financial stress on Viet Nam's financial markets using the Fourier Quantile-on-Quantile Regression (FQQR) framework. Financial stress is proxied by the Office of Financial Research Financial Stress Index (FSI), while Viet Nam's financial markets are represented by the VN-Index (VNI), the Hanoi Stock Exchange Index (HNX), and the USDVND exchange rate over the period January 2019 to December 2025. The results demonstrate clear evidence of nonlinear and state-dependent transmission effects. FSI has a pronounced influence on stock market returns during bearish regimes and high-stress quantiles, with effects intensifying over medium and long horizons. The exchange rate also responds to stress shocks, though the magnitude appears more moderate compared with equity markets. These findings highlight the importance of accounting for distributional asymmetries and time–frequency heterogeneity. The study provides important implications for risk management, portfolio diversification, and macroprudential policy in highly integrated and externally exposed economies such as Viet Nam.

Keywords: Financial stress, stock markets, exchange rate markets, quantile regression, Viet Nam.

1. INTRODUCTION

Over the past decades, the global financial system has become increasingly intercorrelated, rendering equity markets highly susceptible to systemic shocks and financial stress episodes [8]. Major events such as the 2007–2009 Global Financial Crisis, the European sovereign debt crisis, the COVID-19 pandemic, and the Russia–Ukraine conflict have shown how rapidly financial stress can escalate and propagate across markets, amplifying volatility and undermining investor confidence [5]. In such crises, stock markets witness sharp declines, high risks, and breakdowns in diversification benefits, suggesting the crucial role of financial stress in shaping equity market dynamics.

Financial stress (FSI) interacts simultaneously with stock and foreign exchange (FX) markets through balance sheet, capital flow, and expectation channels [12]. An increase in financial stress signals tighter credit conditions and heightened systemic risk, which can reduce equity valuations as firms face higher financing costs and weaker investment prospects. At the same time, stress episodes trigger currency pressures due to capital outflows, portfolio rebalancing, and shifts in global risk sentiment [7]. Depreciation in the domestic currency may further amplify stock market adjustments by affecting firms with foreign currency exposure, import costs, and external debt obligations. By contrast, exchange rate volatility can reinforce

financial stress by increasing uncertainty and risk premiums in equity markets [15]. Therefore, FSI, stock, and FX markets are closely linked, with feedback effects that can either dampen or intensify systemic instability depending on market conditions and external exposure.

This study aims to investigate the impact of global financial stress on Viet Nam's financial markets, focusing specifically on the stock market (VNI, HNX) and the foreign exchange market (USDVND). The primary objectives are: (i) to assess how fluctuations in financial stress influence equity returns and exchange rate movements in Viet Nam, and (ii) to determine whether these effects vary across different market conditions (bearish, normal, and bullish regimes). By addressing these objectives, the study contributes to understanding how global shocks are absorbed and transmitted within Viet Nam's financial system.

Financial stress in this study is proxied by FSI constructed by the Office of Financial Research. The FSI aggregates information from major segments of the US financial system, including credit spreads, equity market volatility, funding conditions, and liquidity indicators into a single composite measure. By synthesizing multiple dimensions of financial tension, the index captures systemic stress more comprehensively than single-market indicators. It is widely recognized in literature as a reliable proxy for macro-financial instability and systemic risk [10], [1]. The selection of the FSI is theoretically justified in the context of Viet Nam's financial markets. As a small open and increasingly integrated emerging economy, Viet Nam is exposed to global capital flows, shifts in investor sentiment, and external monetary conditions largely influenced by the U.S. financial system. Stress originating in the US, the world's largest financial market, can propagate internationally through portfolio rebalancing, risk-aversion channels, exchange rate pressures, and trade linkages. Therefore, the FSI serves as an exogenous and globally relevant stress indicator, enabling us to examine cross-border transmission mechanisms from US financial stress to Viet Nam's stock and foreign exchange markets.

The current work makes several contributions to existing literature. First, it extends the financial stress literature to the context of Viet Nam, an emerging and increasingly integrated frontier market, where empirical evidence remains limited. While prior studies remarkably focus on advanced or large emerging economies, this article provides novel insights into how external systemic risk transmits to Viet Nam's stock and foreign exchange markets. By doing so, the study enriches the understanding of cross-border shock transmission in small open economies. Second, this study contributes methodologically by employing the Frequency–Quantile–Quantile Regression (FQQR) framework. Unlike conventional linear or mean-based models, FQQR simultaneously captures (i) nonlinear and asymmetric effects, (ii) dependence across different market states (bearish, normal, bullish), and (iii) heterogeneous responses across short-, medium-, and long-term frequencies [6]. This multidimensional approach allows us to uncover tail dependence and regime-specific dynamics that would otherwise remain hidden under traditional econometric techniques. As financial stress effects are state-dependent and time-varying, the FQQR methodology provides a more accurate and nuanced representation of the stress–market nexus. Third, the study provides significant policy and practical implications. By identifying the specific market states and time horizons in which Viet Nam's financial markets are most vulnerable to external financial stress, the findings offer valuable guidance for macroprudential authorities, central banks, and market regulators in designing timely stabilization policies. Overall, the study not only advances empirical modeling but also delivers actionable insights for financial stability management in Viet Nam.

The remainder of this paper is organized as follows. Section 2 presents the literature review. Section 3 describes the data and methodology. Section 4 reports empirical results. The final section concludes the study.

2. LITERATURE REVIEW

The transmission mechanism between FSI and stock and foreign exchange markets is described through several interconnected channels. When FSI increases, it typically reflects tighter funding conditions, heightened risk aversion, and increased uncertainty in global financial systems [15]. For equity markets, this leads to capital outflows, portfolio rebalancing toward safe-haven assets, and declining investor confidence, which in turn amplifies price volatility, particularly during bearish regimes [2]. Higher FSI also raises the cost of capital and compresses liquidity, further exacerbating downside risk in stock markets [9]. In the foreign exchange market, FSI can trigger changes in cross-border capital flows and alter exchange rate expectations [8]. Investors could demand foreign currency as a precautionary hedge, leading to depreciation pressures and increased exchange rate volatility [4]. In emerging markets such as Viet Nam, these effects can be magnified due to greater sensitivity to external shocks, though exchange rate management and policy interventions might partially dampen the long-run impact. Overall, FSI transmits to equity and FX markets through risk sentiment, liquidity conditions, funding constraints, and capital flow adjustments, with effects that are inherently state-dependent and persistent over time.

Recent studies highlight a strong and multidimensional relationship between financial stress and foreign exchange markets, operating through monetary policy channels, capital flows, spillover dynamics, intervention mechanisms, and firm-level pricing behavior. At the macro-financial level, [8] demonstrate that foreign exchange stress constitutes a central node within international financial stress networks, where U.S. monetary policy shocks propagate globally through the so-called “dollar tidal effect,” amplifying cross-border spillovers and currency pressures. Similarly, [2] uncover that foreign exchange stress is related with banking and securities markets, thereby underscoring the endogenous nature of currency stress within the broader financial system. From a policy standpoint, [4] provide evidence that foreign exchange interventions can partially mitigate the transmission of external shocks to exchange rates, although the effectiveness depends on the type and magnitude of the shock, suggesting that foreign exchange markets act as both transmission and absorption mechanisms under stress conditions. [9] suggest that FSI and macroeconomic uncertainty significantly predict foreign exchange reserve dynamics, reinforcing the precautionary motive linking stress episodes to rate-related policy responses. Finally, at the firm level, [5] document that FSI alters exchange rate pass-through by inducing export price and quality adjustments, implying that currency movements under stress regimes generate heterogeneous real effects. Generally, the literature indicates that foreign exchange markets are not passive recipients of financial stress but function as active conduits through which monetary shocks, capital flow reversals, and systemic risk are transmitted, amplified, and, in certain cases, partially contained.

The relationship between FSI and stock markets has been extensively documented in the literature. For example, [15] reveal that stock correlations increase systematically during periods of market stress, implying that diversification benefits diminish precisely when they are most needed. This finding provides a structural foundation for understanding how financial stress amplifies systemic risk within equity markets. [12] illustrate that the Global Financial Stress Index possesses long-term predictive power for international stock market volatility. Their results confirm that FSI is a superior forward-looking indicator of equity risk, particularly during crisis periods such as COVID-19. In addition, the impact of FSI appears heterogeneous and regime dependent. [7] find that FSI, alongside EPU and GPR, has asymmetric effects across different quantiles of stock returns, with stronger causal influence in bearish market conditions. Similarly, [11] document that financial stress intensifies connectedness and spillovers among African stock markets, especially under extreme regimes, highlighting its dominant role among macro-shock indicators. From a

nonlinear perspective, [17] report threshold effects whereby increase in financial stress significantly reduce stock returns in selected OPEC countries, confirming the existence of structural breaks and regime shifts. [13] show that geopolitical risks significantly exacerbate financial stress in emerging economies, which in turn affects financial submarkets, including equities, particularly when stress levels are already elevated. [14] extend this perspective by distinguishing between domestic and foreign financial stress in Asia–Pacific markets, revealing that foreign stress, especially originating from major economies, has pronounced negative effects on stock returns.

Overall, the existing literature confirms that financial stress constitutes a vital determinant of stock and foreign exchange market dynamics across both developed and emerging economies. Empirical evidence indicates that financial stress not only depresses financial markets but also amplifies volatility, increases cross-market connectedness, and weakens diversification benefits, particularly during extreme market conditions. Specifically, these influences are nonlinear, asymmetric, and state-dependent, with impacts observed under bearish regimes and heightened systemic risk episodes. These findings highlight the necessity of adopting advanced nonlinear and quantile-based approaches to fully capture the complexity of the FSI–equity nexus and provide a solid foundation for further empirical investigation.

Fourier Quantile-on-Quantile Regression (FQQR)

The FQQR approach represents a recent methodological advancement that extends the original quantile-on-quantile regression framework by incorporating a Fourier-based frequency decomposition. While the QQR model introduced by [18] captures dependence between the quantiles of two variables, it does not distinguish between short- and long-term dynamics. To address this limitation, subsequent studies integrate the frequency-domain methodology of [3] into the QQR setting, giving rise to the Fourier QQR framework. This extension allows researchers to analyze nonlinear and asymmetric relationships across both distributional states and investment horizons simultaneously.

The FQQR model combines the cross-quantile framework with frequency-domain decomposition. The specification is given as:

$$RV_t^\omega = \beta_0(\tau, \theta, \omega) + \beta_1(\tau, \theta, \omega)(FSI_\theta^\omega) + \varepsilon_t^\omega,$$

where:

ω denotes the frequency band (short-, medium-, or long-run),

$\beta_1(\tau, \theta, \omega)$ measures the marginal effect of the θ -th quantile of financial stress at frequency ω on the τ -th quantile of the financial market variable at the same frequency.

This three-dimensional structure allows the estimation of:

State dependence (through quantiles of both variables),

Asymmetry (different responses in lower and upper tails),

Horizon dependence (frequency-specific transmission).

The FQQR framework is appropriate for this study from both theoretical and practical perspectives. Theoretically, financial stress effects are nonlinear, asymmetric, and regime-dependent, as predicted by theories of contagion, downside risk, and time-varying risk premia. Traditional mean-based models are unable to capture these tail-dependent dynamics or distinguish between market states. By combining cross-quantile dependence with frequency decomposition, FQQR allows us to simultaneously examine how different levels of financial stress affect various market conditions across short-, medium-, and long-term horizons. Practically, Viet Nam's financial markets are characterized by episodic volatility, external vulnerability, and varying investor behavior across regimes. As a result, the FQQR provides a

comprehensive framework to uncover hidden transmission patterns of global financial stress, offering more nuanced insights than conventional linear or single-quantile methods [6].

3. METHODOLOGY

This study employs daily data covering the period from 3 January 2019 to 12 December 2025, encompassing major episodes of global and domestic financial turbulence. Financial stress is proxied by the Financial Stress Index (FSI) developed by the Office of Financial Research, which aggregates information from credit, equity, funding, and volatility markets to capture systemic stress conditions in the U.S. financial system. The FSI is widely used in literature as a comprehensive measure of macro-financial uncertainty [10] and is retrieved from the OFR’s official website (accessed on 1 February 2026). Viet Nam’s financial markets are represented by the VN-Index (VNI), the Hanoi Stock Exchange Index (HNX), and the USDVND exchange rate (USDVND). Daily closing prices are used to compute continuously compounded returns, and market volatility is proxied by the absolute value of returns.

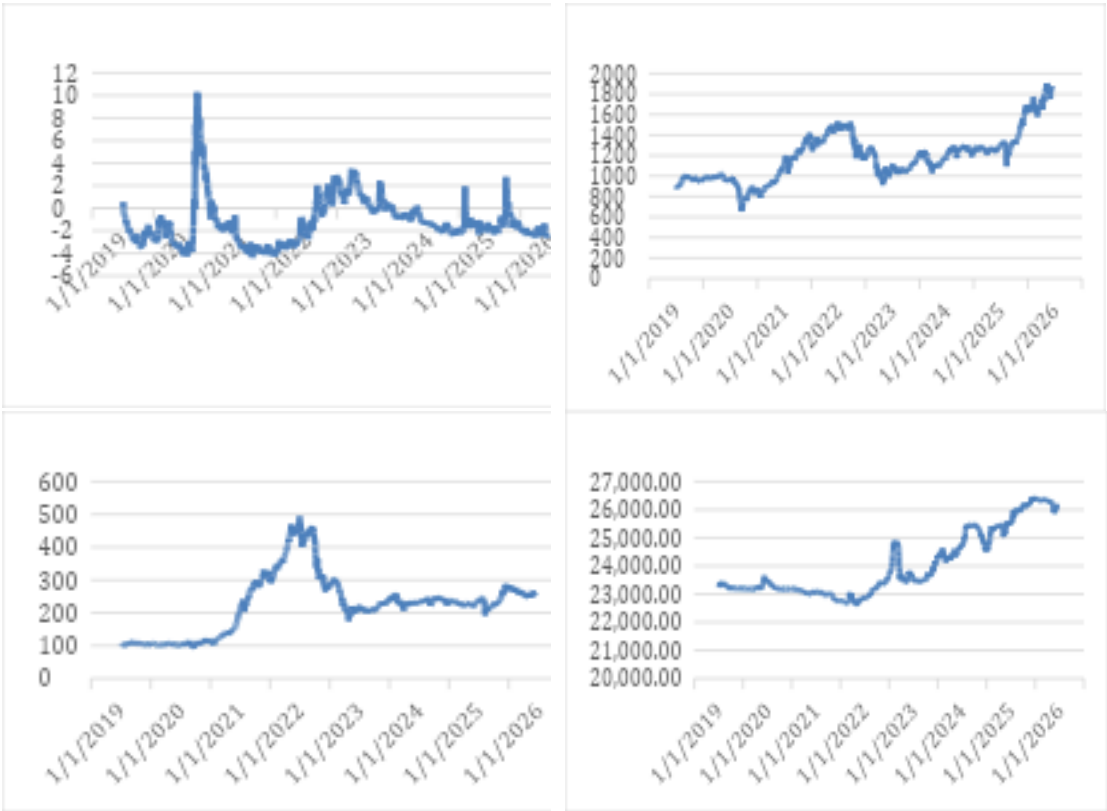


Figure 1. Evolution of Financial Stress and Viet Nam Financial Market Prices (2019–2025)

Figure 1 presents the dynamics of FSI, VNI, HNX, and USDVND from 2019 to 2025. The FSI spikes sharply in early 2020 and shows intermittent fluctuations thereafter. Both VNI and HNX experience a decline in 2020, a strong rebound in 2021–2022, a correction phase, and a gradual recovery toward 2025. Meanwhile, USDVND remains relatively stable initially but trends upward from 2022 onward, indicating a gradual depreciation of the Vietnamese dong.

Table 1. Descriptive statistics

	FSI	HNX	VNI	USDVND
Mean	-1.273300	0.052642	0.041843	0.006411
Median	-1.656500	0.127484	0.135784	0.000000
Maximum	10.26600	7.856371	6.546905	1.175292
Minimum	-4.364000	-8.375977	-6.910236	-1.531170
Std. Dev.	2.031169	1.380471	1.223729	0.149028
Skewness	1.604050	-0.992968	-1.049340	-0.053801
Kurtosis	7.586702	8.214198	8.526121	18.93012
Jarque-Bera	2326.233***	2311.537***	2594.479***	18843.19***
ADF	-3.899663***	-38.35862***	-38.79593***	-16.61488***

Notes: *** denotes the significance level at 1%

Table 1 shows the descriptive statistics of FSI and the returns of HNX, VNI, and USDVND. The average value of FSI is negative (-1.273), indicating generally low-to-moderate stress conditions over the sample period. The Vietnamese equity markets (HNX and VNI) exhibit relatively small average returns with substantial dispersion, as indicated by their standard deviations while USDVND indicates comparatively lower volatility (0.149). The skewness statistics suggest that stock returns are negatively skewed, implying a higher probability of extreme negative returns, whereas FSI is positively skewed. All series display excess kurtosis, indicating fat-tailed distributions and the presence of extreme observations. The Jarque–Bera statistics reject the null hypothesis of normality at the 1% level for all variables. Finally, the Augmented Dickey–Fuller (ADF) test statistics confirm that all series are stationary at the 1% significance level, supporting their suitability for subsequent quantile-based and frequency-domain analyses.

Figure 2 represents the Q–Q plots of FSI, HNX, VNI, and USDVND against the normal distribution. All series exhibit noticeable deviations from the 45-degree reference line, particularly in the tails, indicating non-normality and fat-tailed behavior. The equity market returns (HNX and VNI) reveal pronounced tail departures, consistent with excess kurtosis and negative skewness, while FSI shows asymmetry with heavier upper tails. USDVND also deviates from normality, especially at extreme quantiles.

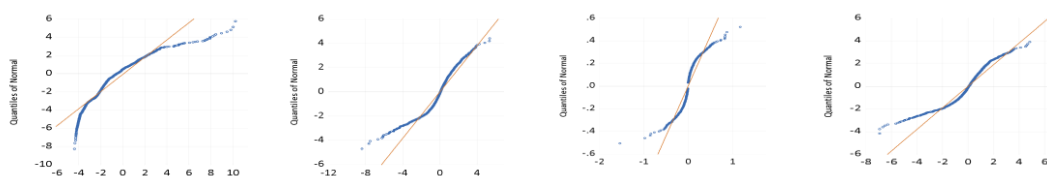


Figure 2. Q-Q Plots

Figure 3 documents the linear correlation matrix and pairwise distribution plots of FSI, VNI, HNX, and USDVND. The heatmap indicates a strong positive correlation between VNI and HNX (0.82), reflecting the high comovement between the two Vietnamese equity markets. On the other hand, FSI exhibits weak correlations with VNI (-0.014), HNX (-0.064), and USDVND (0.023). The pairwise scatter plots further confirm these patterns, showing a clear linear association between VNI and HNX but dispersed and nonlinear relationships for other variable pairs.

Overall, the descriptive statistics and preliminary diagnostics indicate that all time series uncover non-normality, excess kurtosis, and tail behavior, while remaining stationary at 1%

significance levels. The Q–Q plots and low linear correlations, particularly between FSI and Viet Nam’s financial markets suggest the existence of asymmetric and nonlinear associations that cannot be fully captured by mean-based models. These characteristics provide strong empirical justification for employing FQQR model, which is appropriate for suggesting distributional asymmetries and horizon-dependent relationships across different market situations.

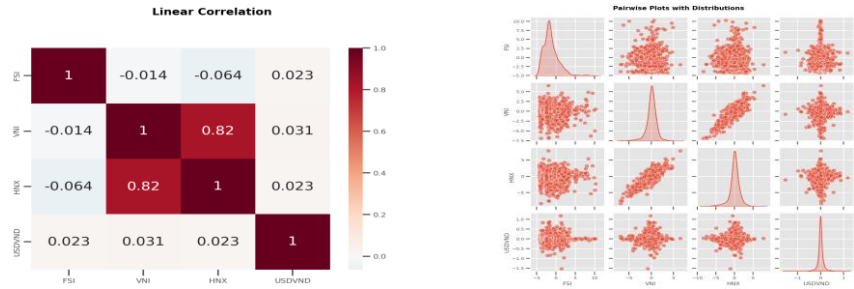


Figure 3. Heatmap correlation and pairwise distribution

Empirical results

This section represents the empirical findings from FQQR analysis estimating the impact of FSI on Viet Nam’s financial markets. Specifically, we report the FQQR results for the full sample period to capture the overall nonlinear and frequency-dependent price effects from FSI to VNI, HNX, and USDVND. Before discussing the findings, it is important to clarify the interpretation of frequency bands and market states. Following [3] and [16], the short run, medium run, and long run correspond to 1–5 days, 6–22 days, and 23 days and beyond, respectively. These frequency components allow us to distinguish between transitory, intermediate, and persistent transmission effects. Furthermore, we classify quantiles 0.1–0.3, 0.4–0.6, and 0.7–0.9 as showing bearish, normal, and bullish market situations, respectively. This classification enables a clear interpretation of how financial stress affects Viet Nam’s financial markets under different market regimes and across different investment horizons.

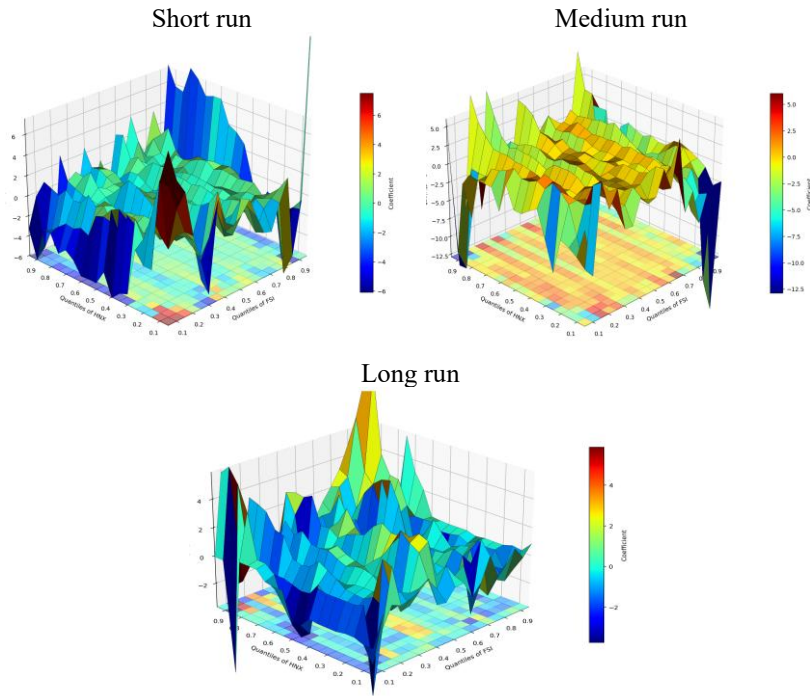


Figure 4. FQQR estimates of FSI and HNX

Figure 4,5,6 represent the three-dimensional FQQR estimates capturing the impact of FSI on Viet Nam's financial markets across different quantiles and frequency domains. In each Figure, the axes (Ox and Oy) represent the quantiles of the examined variables, while the vertical axis (Oz) displays the estimated slope coefficient. The color gradient reflects the magnitude and direction of the impact, with warmer colors indicating positive effects and cooler colors indicating negative effects. The three panels correspond to short run (1–5 days), medium run (6–22 days), and long run (23 days onward), allowing us to distinguish transitory from persistent transmission effects. By examining the surface patterns across quantile combinations, we can identify asymmetric, state-dependent, and horizon-specific nexus that cannot be captured by conventional linear models.

Figure 4 shows the FQQR estimates of the impact of FSI on HNX across quantiles and frequency bands. In the short run, the impact of FSI on HNX is highly state-dependent. The positive coefficients are concentrated in the lower quantiles of HNX (bearish market conditions), particularly when FSI is in its upper quantiles. This indicates that elevated financial stress significantly amplifies price spillovers during downturns in the HNX market. By contrast, the effect becomes weaker and negative when HNX lies in higher quantiles (bullish states), suggesting that favorable market sentiment partially mitigates the transmission of external stress. Economically, this pattern reflects a short-term flight-to-safety and liquidity-withdrawal mechanism: when global stress rises, risk-averse investors reduce exposure to emerging equity markets, intensifying downside volatility.

In the medium run, the positive influence of FSI becomes more widespread across quantile combinations. The plot demonstrates positive coefficients when FSI remains at medium-to-high quantiles. This suggests that sustained stress conditions lead to significant co-movements, likely driven by portfolio rebalancing, capital flow adjustments, and increased funding constraints. The medium-run transmission indicates that stress shocks are not merely transitory but propagate through financial channels over several trading weeks.

In the long run, the magnitude of the relationship remains economically significant, with stronger effects observed when FSI is high and HNX is in lower or median quantiles. This implies that prolonged financial stress generates persistent fluctuations in the HNX market. From an economic perspective, extended periods of global stress could weaken investor confidence, increase external financing costs, and amplify systemic risk in Viet Nam's equity market, particularly in the more speculative and liquidity-sensitive HNX segment.

Overall, the results suggest that the HNX market is vulnerable to external financial stress during bearish regimes and over longer horizons. The asymmetric response highlights that the impact of stress is not uniform across market conditions. These findings are consistent with prior quantile-based studies documenting strong spillover effects of global uncertainty and financial stress on emerging markets during extreme market conditions. Similar to the evidence reported in [12] and [11], the transmission effects tend to strengthen over longer horizons, reflecting cumulative adjustment mechanisms.

Figure 5 presents the FQQR estimates of the impact of FSI on VNI across quantiles and investment horizons. In the short run, the plot reveals that positive effects occur when FSI is in its upper quantiles and VNI is located in its lower quantiles (bearish states). This indicates that heightened financial stress significantly increases volatility during market downturns. By contrast, when VNI lies in its upper quantiles (bullish regime), the impact of FSI becomes negative. Economically, this suggests that short-term stress shocks mainly exacerbate downside risk, consistent with rapid capital outflows and increasing investor risk aversion during turbulent periods.

In the medium run, the return effects become more persistent and spread across a wide range of quantile combinations. Positive coefficients dominate when FSI remains at medium-

to-high levels, suggesting that stress conditions generate volatility spillovers. This pattern reflects intermediate-term adjustment mechanisms such as portfolio reallocation, shifts in foreign investor positioning, and increased uncertainty about macro-financial stability.

In the long run, the magnitude of the coefficients remains statistically significant, particularly when FSI is high and VNI is in its lower or median quantiles. The persistence of positive effects implies that prolonged financial stress translates into volatility in Viet Nam's equity index. Compared with HNX, the VNI surface appears relatively smoother, suggesting that the larger and more diversified firms in the VN-Index may partially absorb external shocks, though they remain vulnerable under extreme stress conditions. Economically, the outcomes highlight that Viet Nam's main equity market is sensitive to external financial stress, especially during bearish scenarios and when stress shocks persist over time. The asymmetric nature of the relationship underscores that the impact of global stress is magnified during adverse market conditions, consistent with contagion and downside risk spillover theories.

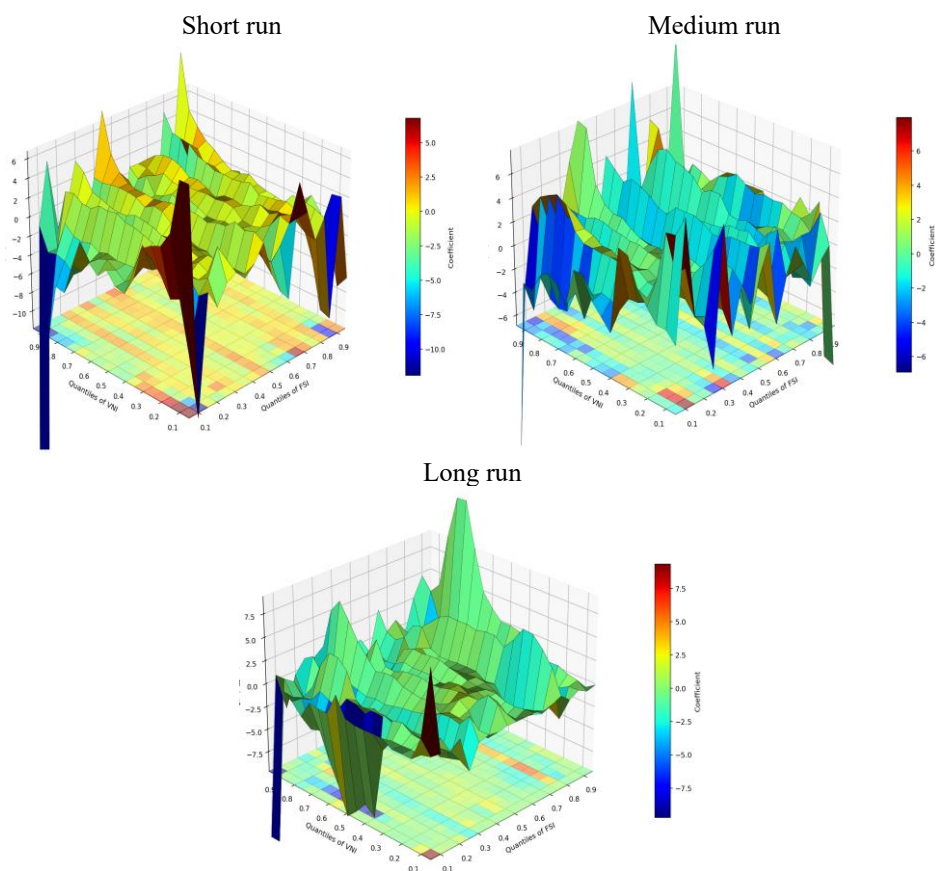


Figure 5. FQQR estimates of FSI and VNI

Figure 6 documents the FQQR estimates of the impact of FSI on USDVND across quantiles and frequency domains. In the short run, the coefficients fluctuate across quantile combinations, with both positive and negative regions. Stronger positive effects are observed when FSI lies in its upper quantiles and USDVND is in lower-to-median quantiles, suggesting that sudden increases in financial stress tend to raise exchange rate volatility, particularly during relatively stable currency conditions. Nevertheless, in extreme upper quantiles of USDVND, the impact of FSI becomes weaker or even negative in some regions. This might reflect short-term policy interventions or liquidity management by the State Bank of Vietnam. In the medium run, the transmission effects become more systematic. Positive coefficients

dominate when FSI remains elevated, indicating that sustained financial stress increases exchange rate volatility across most market states. The medium-term dynamics likely capture capital flow adjustments, exchange rate expectations, and external financing pressures. As global financial stress intensifies, investors may rebalance portfolios toward safer assets, leading to increased demand for foreign currency and heightened exchange rate fluctuations.

In the long run, the associations become more persistent but relatively smoother compared with the equity markets. The plot suggests that prolonged financial stress has a positive and economically significant effect on USDVND, particularly when stress levels are high. This implies that extended episodes of global stress can translate into sustained currency pressures and higher exchange rate risk in Viet Nam. Nevertheless, the magnitude of the coefficients appears somewhat less extreme than those observed for HNX and VNI, reflecting the partially managed exchange rate regime in Viet Nam, which may moderate long-term volatility spillovers.

From an economic perspective, the outcomes highlight that Viet Nam's foreign exchange market is sensitive to external financial stress, especially when stress is persistent. The asymmetric effects across quantiles suggest that stress shocks have strong implications when originating from elevated global uncertainty rather than from normal conditions. Compared with prior studies of [8] and [9] on emerging markets, our results are consistent with evidence that global financial stress and uncertainty indices significantly affect exchange rate volatility, particularly over medium and longer horizons.

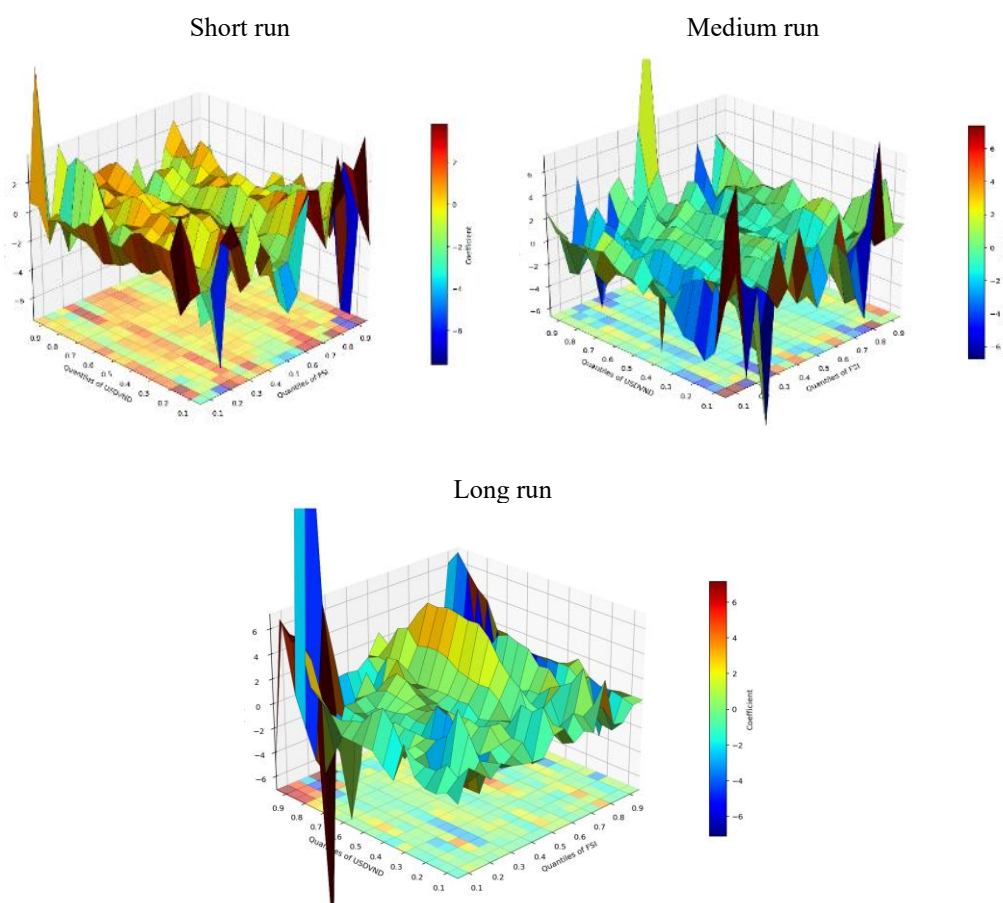


Figure 6. FQQR estimates of FSI and USDVND

4. DISCUSSION

The FQQR results illustrate that financial stress has a nonlinear, asymmetric, and horizon-dependent impact on Viet Nam's financial markets. The effects are generally stronger when financial stress is increasing and when markets are in bearish states, particularly for the equity indices. Moreover, the transmission mechanism intensifies over medium and long horizons, suggesting that stress shocks are not purely transitory but accumulate over time. By contrast, the exchange rate also responds to financial stress, but the magnitude of the long-run impact appears relatively more moderate compared with equity markets.

These findings are consistent with existing financial theory. Under increasing financial stress, investors tend to experience strong risk aversion, triggering capital reallocation away from risky assets and toward safe havens [8]. This behavior increases downside volatility in equity markets, especially during bearish regimes. Over longer horizons, persistent stress might affect funding conditions, liquidity, and expectations, leading to more volatile. The asymmetric response across quantiles aligns with downside risk and contagion theories, which uncover that shocks propagate more strongly during periods of market distress compared to phases of economic expansion.

Our results are in line with previous empirical studies [12], [7], [11], [17], who document that global uncertainty and FSI have stronger effects on emerging markets during extreme conditions and crisis periods. Nevertheless, this study extends the literature by providing frequency-specific and state-dependent evidence for Viet Nam's financial markets, highlighting differences between equity and foreign exchange segments.

From a policy and investment perspective, the findings provide several important implications. For policymakers, the stronger impact of financial stress during bearish regimes underscores the need for timely liquidity support and macroprudential measures to mitigate volatility amplification. For investors, the horizon-dependent effects suggest that risk management strategies should account for both market states and the persistence of stress shocks. More importantly, the results emphasize the importance of monitoring global financial stress indicators as early warning signals for volatility surges in emerging markets such as Viet Nam.

5. CONCLUSION

This study investigates the nonlinear and horizon-dependent effects of financial stress on Viet Nam's financial markets using the FQQR framework over the period from January 2019 to December 2025. By decomposing the dynamics into short-, medium-, and long-run components and examining cross-quantile interactions, the analysis provides a comprehensive assessment of how global financial stress transmits to the Vietnamese equity and foreign exchange markets under different market conditions.

The empirical findings unveil strong evidence of asymmetric and state-dependent spillovers. Financial stress has a more pronounced positive effect on market volatility during bearish regimes, particularly for the HNX and VNI indices. The transmission effects become more persistent over medium and long horizons, suggesting that stress shocks accumulate over time rather than dissipating quickly. While the USDVND exchange rate also responds to financial stress, the magnitude of the long-run impact appears relatively more moderate, possibly reflecting the managed nature of Viet Nam's exchange rate regime.

These results contribute to the growing literature on financial stress spillovers by demonstrating the importance of accounting for both distributional asymmetries and frequency-specific dynamics in emerging markets. The findings underscore that mean-based or linear approaches may underestimate the true extent of stress transmission, especially during extreme market conditions.

From a policy perspective, the evidence highlights the need for proactive monitoring of global financial stress indicators as part of macro-financial surveillance frameworks. For investors and risk managers, the results emphasize that vulnerability to external stress varies across market states and investment horizons, reinforcing the importance of dynamic and state-contingent risk management strategies. Future research may extend this framework to multivariate settings or incorporate domestic stress indicators to further disentangle global and local transmission channels.

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