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Impact of Financial Instability on Economic Activity: Evidence from ASEAN Developing Countries

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Abstract

Theoretical literature agrees on the interaction between financial instability and economic activity but explains it's dynamic in two points of view: one is that the transmission mechanism occurs in one unique regime and the other reckons a shift of regime leads to the alteration of the transmission mechanism. This study aims to find evidence of the multi-regime transmission for ASEAN developing countries. The author employs the technique of Threshold vector auto regression using the financial stress index standing for financial instability. Monthly data is collected, covering a period long enough with many episodes of high stress in recent decades. There are two conclusions: (1) A financial shock has a negative and stronger impact on economic activity during a high-stress period than it does during a low-stress period; (2) the response of economic activity to a negative financial shock during high-stress periods is stronger than it is during normal times. The findings point to the importance of the financial stress index as an additional early warning indicator for the real economy sector, as well as the positive effect that a reduction in financial stress may have on economic activity, implying the importance of "unconventional" monetary policy in times of high financial stress.

Keywords: Financial Instability, Economic Activity, Threshold Vector Autoregressive Model, ASEAN Developing Countries

JEL Classification Code: C32, D52, D53, E44, G01

1. Introduction

The financial crisis that began in the United States in 2008 quickly spread around the world, disrupting the financial system's stability in some countries and regions. Many actions were taken by governments around the world to mitigate its impact, but they were ineffective in preventing significant contraction and a prolonged recession. Before the global financial crisis, financial markets had little influence on economic growth. The majority of studies focused on the financial sector's development. The primary goal of central banks has been to maintain price stability to foster economic growth, and the financial sector has been deregulated in recent decades. A substantial literature has re-evaluated the link between financial instability and the real side of the economy since the onset of the financial crisis. To model this relationship, related theoretical analyses focused on the financial accelerator. Endogenous changes in credit markets, according to Bernanke et al. (1999), serve to spread and amplify exogenous shocks to the macroeconomy when frictions exist. However, in the model, a financial accelerator is only applied to enterprises and people, and thus only captures the locally magnifying effect. According to Brunnerneier and Sannikov (2014), furious asset-price swings trigger a destabilizing process, resulting in a downward spiral.

Many studies provide empirical data to support this connection. According to Hakkio and Keeton (2009), financial instability can have an impact on economic activity in the United States, but the condition of economic activity cannot be used to predict the state of financial instability. The same conclusion was reached in Apostolakis and Papadopoulos' (2015) study, which looked at data from nineteen industrialized economies. When studying transition economies in Europe, Cevik et al. (2013) discovered that this association also exists in the opposite direction.

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According to several additional research, the relationship between financial instability and the real sector changes depending on the extent of financial market stress.

While the latest crises originated in the West, they have had a significant impact on most Asian countries. The volatility in major global financial markets from 2007 to 2009 resulted in a drop in lending and investment, as well as dramatic swings in stock market prices and a depreciation of local currencies across the region. As a result, the ASEAN countries' economic growth declined by around 6.6 percent from 2007 and 2009. Some empirical studies have found evidence of the impact of financial instability on developing country economic activity (Cevik et al., 2016). But there has not been further analysis of this dynamic relationship for ASEAN countries.

The study uses a threshold regression model to see if the impact varies depending on the level of financial instability to provide more empirical evidence for more insights into the feature of the impact of financial instability on economic activity for developing countries in the ASEAN region. In terms of policy, the findings provide useful information.

2. Literature Review

The study of macro-financial links has taken on several dimensions. Studies on the impact of financial development on economic growth were conducted in the past. The majority of empirical research has indicated that financial development has a positive impact on economic growth (Valickova et al., 2015). Other research has suggested that this association is not linear. If the level of financial development falls below a specific threshold, finance may have a negative impact on economic growth (Tariq et al., 2020).

Since multiple financial crises have occurred in recent decades, the role of financial instability in macro-financial interconnections has become increasingly important. Financial accelerator theory is a theoretical model that is used to model the influence of financial instability on economic activity. The external finance premium (EFP) and borrowers' net worth are adversely associated with the presence of financial frictions, according to Bernanke et al. (1999). Borrowers' net worth increases when investment, output, and asset prices rise as a result of a positive shock. The external financing premium falls as leverage falls. This, in turn, boosts investment and accelerates the recovery. This occurs in the opposite direction during recessions. All of this contributes to shock amplification and propagation. Collateral constraints are used by Kiyotaki and Moore (1997) to interpret this financial accelerator mechanism. When an unfavorable shock happens during an economic downturn, enterprises are impacted by the devaluation of assets used as collateral, forcing them to limit borrowing and investment, resulting in a drop in output and worsening the recession.

After that, the financial accelerator idea was extended to include financial intermediaries. According to Gertler and Kiyotaki (2010), an agency problem creates a gap between loan and deposit rates by limiting financial intermediaries' ability to receive deposits in retail financial markets as well as money from one another in interbank. During a crisis, the spread expands dramatically, raising credit rates dramatically. Non-financial companies can only get a limited amount of money from financial intermediaries. The poor allocation of funds across intermadiaries can further decrease real activity to the extent that the limits generate disruptions in interbank markets.

This body of work, on the other hand, uses DSGE-type models, which are often solved by linearization around a single, stable state, with amplifying effects occurring in a range of deviations around the steady state (Mittnik & Semmler, 2013). It suggests that while the economy may accelerate, it will eventually return to a steady condition.

Advanced financial accelerator models have recently argued that an unstable dynamic could exist. Brunnermeier and Sannikov (2014) demonstrated that shocks have a very nonlinear effect on the system. Except for extraordinarily large shocks that are highly amplified and could push the system into a crisis regime, the system is resilient to most shocks at a near-steady state due to the restoration of non-financial borrowers' net value. Endogenous risks, which are self-generated by asset price declines resulting from market participants' restrictions and precautionary motives, would multiply and propagate adverse shocks once under this regime. Comparable approaches are focused on the banking industry. In this opinion, banks' risk-taking is facilitated by excessive growth of capital assets through borrowing and banking leverage due to a lack of limitations in the banking sector (Mittnik & Semmler, 2013) or a low-interest-rate environment with no credit spread (Mittnik & Semmler, 2018). When overleveraging occurs, the system may be driven into a downward spiral by financial stress caused by a burst asset price bubble and increased credit spread.

From an empirical perspective, many previous studies predict a linear relationship between financial instability and economic activity. In most cases, the findings show that there is a negative and statistically significant impact of financial instability on economic activity (Hakkio & Keeton, 2009; Cevik et al., 2013, 2016; Apostolakis & Papadopoulos, 2015; Polat & Ozkan, 2019). The impact in the reverse direction is found in a few studies (Cevik et al., 2013; Pranata & Nurzanah, 2017).

Multi-regime vector autoregression models are deemed ideal for analyzing changing transmission dynamics. The majority of the publications employed threshold or markov-switching VARs, with the notion that parameters can vary

between economic situations. With time-varying parameter VARs, certain studies allow parameters to change smoothly over time. Many studies that look at the responsiveness of the financial stress index to production find similar results and discover that the reactions are more persistent (Hubrich & Tetlow, 2015; Stona et al., 2018). However, the magnitude of the effects varies greatly between countries. According to Mittnik and Semmler (2013), the signs and sizes of a financial stress shock result in asymmetric real responses for the United States and the five largest EU economies, with the extent of real responses being stronger from a negative financial shock than a positive shock and larger from a financial shock with larger sizes. Meanwhile, German's (Van Roye, 2014) research implies that these real-world effects are symmetric.

In summary, most studies suggest that when the economy is in a high-stress state, financial instability has a significant impact on economic activity, whereas, in a low-stress state, the impact is small. However, the extent of the consequences varies depending on the symptoms and sizes of the financial shock.

3. Data and Research Methods

3.1. Data Resources

The study looks at Indonesia, Malaysia, the Philippines, Thailand, and Vietnam, which are all ASEAN emerging countries. Financial variables data is collected monthly for each economy from January 2005 to May 2020, with the exception of Vietnam, which is collected from January 2007 to May 2020. The IMF database was used to obtain information on the banking sector's assets and liabilities. Thomson Reuters DataStream provided the stock market index and bank sector stock market index, as well as 10-year government bond yields. The official foreign currency rate and international reserves were obtained from the GEM database of the World Bank. Data on industrial production comes from an IMF resource, and data on total fixed-asset investment comes from DataStream.

3.2. Financial Instability and Economic Activity Dynamic

To address the multi-regime transmission of financial instability to economic activity, the study employs a multi-regime VAR model in the form of a threshold multivariate autoregression model. It is a simple and parsimonious approach that can capture the non-linear dynamic mechanism (Hansen, 2000). This model can detect the existence of various regimes and examine regime dependence in this setting. It means that the impacts of shocks on the system may not be similar in different states and responses of the system may be asymmetric to positive and negative shocks and nonproportional to different shock sizes. Moreover, regime transition is triggered by an observable endogenous variable, which thus has a direct economic interpretation and could provide a more apparent phenomenon for policy implication. In the estimation of TVAR, the study uses financial stress index (FSI) and variables standing for economic activity that are endogenous variables and FSI as the threshold variable.

The TVAR model specification is as follow:

$$y_t = c_i + \sum_{j=1}^{p_i} A_{ij} y_{t-j} + \varepsilon_{it} \;\; \varepsilon_{it} \sim (0, \Sigma_i), \quad \text{if } \tau_{i-1} < r_{t-d} \le \tau_i, \text{ for } i = 1, \ldots\ldots, M, \text{ and } d > 0 \tag{1}$$

Where y is a vector of endogenous variables, rt_{-d} is the value of the threshold variable at time $t–d$ and regimes is specified by the threshold levels: $\tau_0 < \tau_1 < \ldots < \tau_M$, c_i is a constant vector, p_i is the autoregressive order in regime i, A_{ij} is the matrix of coefficients of regime i lag j, and Σ_i is the variance-covariance matrix of regime i. The threshold and delay values, r and d respectively, are not known and must be defined from the system by conducting through the grid search algorithmic. Then the OLS method is used to estimate a separate VAR in each regime.

Before the estimation, the TVAR model needs to be tested if there is a presence of nonlinearity. The test we use in this paper is the multivariate extension of the linearity test by Hassen (1996) proposed by Lo and Zivot (2001). In this case, the Likelihood Ratio test that is used to compare the covariance matrix of each model is computed as follow:

$$LR_{ij} = T(\text{In}(\det \widehat{\Sigma_i}) - \text{In}(\det \widehat{\Sigma_j})) \tag{2}$$

Where $\widehat{\Sigma}_i$ is the estimated covariance matrix of the model with i regimes (and so i–1 thresholds), det is the notation for the determinant of the matrix, T as the number of observations. There are three tests, such as test 1 vs 2 (Linear VAR vs 1-threshold TVAR), test 1 vs 3 (Linear VAR vs 2-threshold TVAR), and test 2 vs 3 (Threshold TVAR vs 2-threshold TVAR). The first two tests are to determine whether the linear model is rejected or not. Once there is the presence of the thresholds, the third test is to identify whether the model is with one threshold, or two thresholds prefers.

Once the estimation of the threshold VAR is obtained, we implement the impulse response analysis. We follow the approach of Koop et al. (1996) to generate the so-called generalized impulse response functions (GIRF), in which the reactions of variables to an exogenous shock depend on the sizes and signs of the shocks and the history of variables. In this case, the responses may be not symmetric and

consequently cause to move between the regimes because of a large shock. The GIRF can be defined as follows:

$$\begin{aligned} \text{GIRF} = & E\left[Y_{t+m} \mid \varepsilon_t, \varepsilon_{t+1} = 0, \ldots, \varepsilon_{t+m} = 0, \Omega_{t-1}\right] \\ & - E\left[Y_{t+m} \mid \varepsilon_t = 0, \varepsilon_{t+1} = 0, \ldots, \varepsilon_{t+m} = 0, \Omega_{t-1}\right] \end{aligned} \quad (3)$$

Where Y_{t+m} is a vector of variables at time $t+m$ and Ω_{t-1} presents a history. It is explained that GIRF is the difference between the forecasted paths of a variable between the system without a shock and in the one hit by a shock. Monte Carlo simulation is used to generate GIRF.

3.3. Measures of Financial Instability and Economic Activity

The first step in assessing the empirical link between financial instability and economic activity is to create a financial stress index to measure financial instability. Financial instability, according to Mishkin (1999), happens when shocks to the financial system causes asymmetric information to become so severe that the financial system is unable to perform its key duties. Financial instability can be measured in a variety of ways. A single measure is used in one method. Carlson et al. (2011) employed the distance-to-default (DD) method to assess the health of the financial system. Pham and Doan (2020) defined financial stability as the Bank *Z* score, which is a measure of the probability of default in the banking sector. However, due to its vastness, a single metric may be insufficient (ihák, 2007). It is critical to have a measure that takes into account all potential sources of risk and vulnerabilities in the financial system (Schinasi, 2006). The financial stress index has been utilized in a variety of empirical studies since the financial crisis of 2007–2009. It is a composite index made up of sub-indices that are proxies for financial system instability in key areas such as financial intermediaries, money markets, equities markets, bond markets, and foreign currency markets. Variance-equal weight, credit weights, dynamic factor model, and principal component analysis are used to aggregate these indicators. A financial stress index is considered useful, according to Hakkio and Keeton (2009), when it can reach peaks during periods of extreme financial stress.

The study follows the approaches of Balakrishnan et al. (2011) and Cevik et al. (2013) for developing countries to formulate financial stress index for this paper. Financial indicators from four key financial industries are included in the index. The banking beta, which is derived using the capital asset pricing model (CAPM) with market returns for the equities market and banking sector on a 12-month rolling basis, is the proxy in the banking industry. A financial system risker has a beta greater than one. An alternative measure of the riskiness of banking sector is banking sector fragility index proposed by Kibritçioglu (2003) and applied to build FSI for transition economies in Cevik et al. (2013).

The banking sector fragility index (BSF) is calculated using bank real deposits (DEP), real claims on the domestic private sector (CPS), and bank foreign liabilities (FL). Due to a lack of data on banking beta calculation throughout the research period, the latter measure was used for Vietnam. In the security market, riskiness is measured by two variables: stock market returns, which are calculated as the inverted year-on-year change in the stock index, and stock market volatility, which is calculated using month-on-month market returns using the GARCH (1,1) model. According to Balakrishnan et al. (2011), the stress in the international market is measured by the Exchange Market Pressure Index (EMPI). For economies with fixed or carefully regulated exchange rates, the index suggested by Girton and Roper (1977) is used. Finally, the riskiness of the bond market is measured by risk spread and the volatility of government bond yields, due to the government sector's dominance. The risk spread is the difference between the yield on long-term government bonds and the yield on long-term government bonds in the United States. The monthly standard deviation of daily bond yield changes is used to calculate the volatility of government bond yields.

The standardization procedure is used to turn individual variables into the same scale before they are averaged into a sub-index. With the credit weight approach established by Illing and Liu (2006), these sub-indices are aggregated into a composite index termed financial stress index. The weights allocated to the sub-indices are based on the proportional share of total credit proxied by each financial sector. The greater the sector's share of total credit, the more significant the sector is to the economy. Bank credit, bonds, equities, and US currency credit all contribute to total credit in an economy.

The yearly growth rate of industrial production (IP) is regarded as an appropriate measure for economic activity because the research is based on highly frequent data, as in prior studies. Because IP data does not cover the whole research period in Vietnam, the author uses the annual growth rate of Total investment for fixed assets (INV) as an alternative variable.

4. Empirical Results

4.1. The Evolution of Financial Instability

Figure 1 depicts the performance of financial instability in five ASEAN emerging countries. The FSI behaviour for all sample countries reflects well-known historical stress episodes. Domestic shocks caused some stress events, while regional and global shocks caused others.

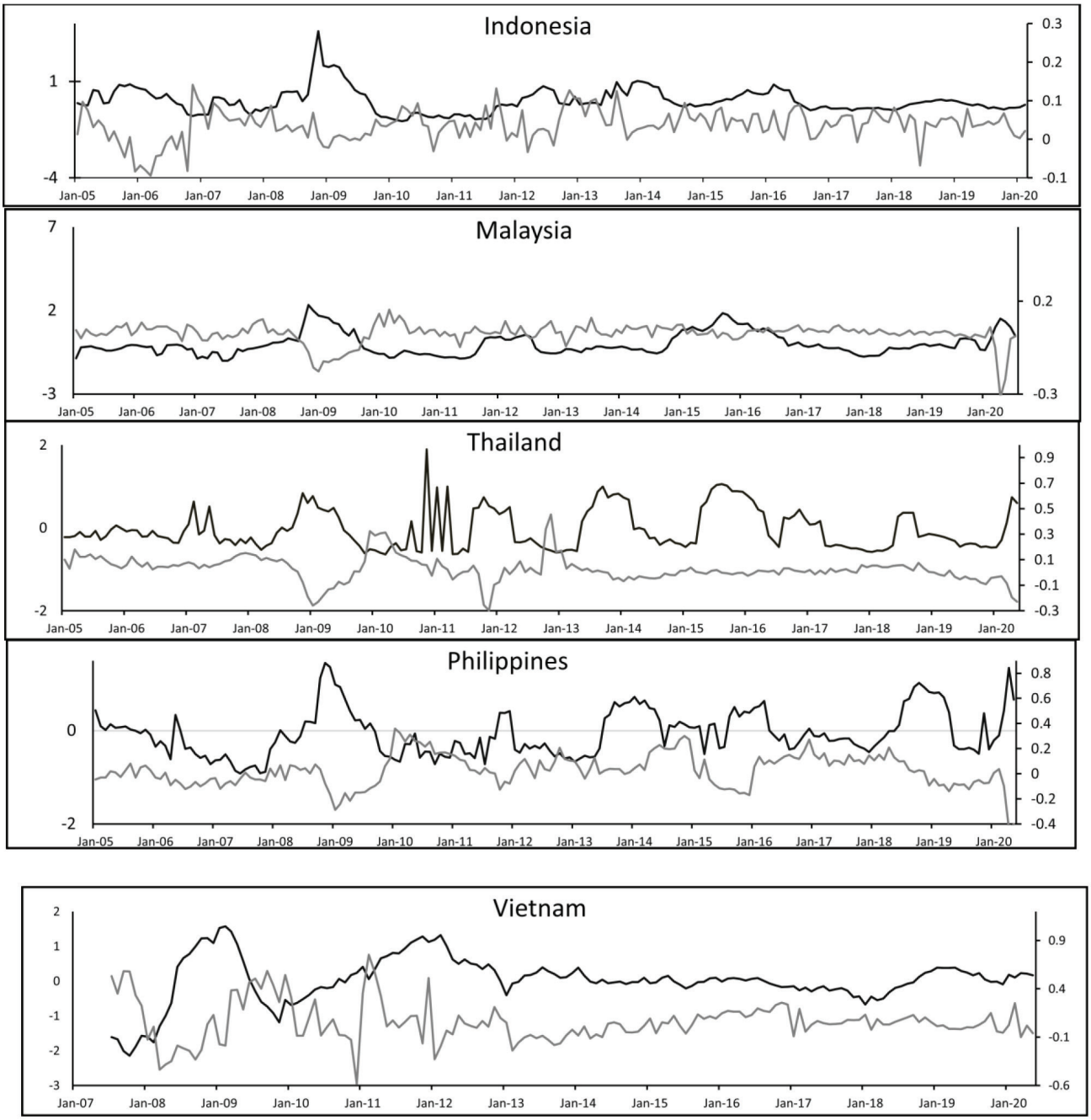

Figure 1: Evolution of FSI (left axis, top line) and Economic Activity Index (right axis, bottom axis)

The financial stress index for Indonesia increased for the first time during the "mini crisis" in August 2005, when the rupiah dropped due to concerns about an increase in global oil prices. Then, when the financial crisis hit in 2008, it peaked and then began to increase again in the second half of 2011, when the Euro debt crisis hit. Shortly after that, in May 2013, the taper tantrum prompted by unorthodox monetary policy in the US and AE countries caused a reversal in capital flows in emerging nations, pushing the financial stress index back up until the start of 2014. The turmoil in China's stock market in June 2015 had an impact on Indonesia's financial markets. The FSI increased

throughout this time period, as can be shown. However, it was unaffected by trade tensions between the United States and China from 2018 to 2019, until the outbreak of the COVID-19 pandemic at the start of 2020.

Malaysia's, Philippines', and Thailand's financial stress indexes, like Indonesia's, correlate with regional and global critical instability situations. After a significant increase during the global financial crisis in 2008, Vietnam's FSI began to rise again in early 2011. This is due to the Vietnamese government's stringent monetary and fiscal policies in response to severe macroeconomic instability, which resulted in the collapse of the real estate market and a surge in non-performing bank loans. Despite some reprieve, financial stress persisted due to poor financial performance in the banking industry and a rise in non-performing loans.

4.2. Descriptive Relationship Between Financial Instability and Economic Activity

In addition, Figure 1 plots the FSI and the economic activity index for each of the study countries. For all of the countries, the graphs show an inverse link between the FSI and the economic activity index. The economic activity index tends to fall when the FSI is pushed to extremes. In times of low financial stress, the economic activity index appears to improve.

Granger causality tests are still being used to investigate this link. The null hypothesis "FSI does not Granger cause economic activity" is rejected in all nations with *p*-values less than 5%, except for the Philippines, which has a *p*-value of 10%. In the other direction, the null hypothesis is only rejected for Vietnam if the *p*-value is less than 1%. (see Table 1). Granger causality results show that this correlational relationship is one-way for four of the five nations, i.e., from financial stress index to economic activity, and two-way for Vietnam. These experiments, on the other hand, only show that the association is linear. In the following part, we look at more evidence of nonlinear financial stress index transmission on economic activity.

4.3. Stationary Test

The time series used in the model estimate must be stationary. The ADF unit root test by Augmented Dickey-Fuller and the PP unit root test by Perron-Phillips are employed as stationary tests. For all series, the number of augmentation lags specified by the Schwarz information criteria (SC) for the ADF test equals one. Table 2 shows that all variables are stationary at the same level.

4.4. Threshold Test

To assess if linearity exists in the data format, the author employed Lo and Zivot's (2001) rigorous Hansen test for linearity. The lag sequence and threshold latency have an impact on the test results (*d*). A VAR estimation is used to define. The importance of parsimony is shown by the fact that higher lag orders in the TVAR model require more parameters, therefore the lag-order is chosen among different criteria as short as possible. In this circumstance, a VAR with one lag for Indonesia, Malaysia, and the Philippines and two lags for Thailand and Vietnam might suffice. The threshold lag (d) equals one in all instances.

The results of the linearity test are shown in Table 3. The *p*-value for the LR test for linearity against two regimes is significant at 1%, but only 10% for the test against three

Table 1: Granger Causality Tests Between FSI and Economic Activity

Hypothesis	Indonesia	Malaysia	Philippines	Thailand	Vietnam
FSI does not Granger cause economic activity	20.336***	13.513***	3.7226**	16.599***	3.5036**
Economic activity does not Granger cause FSI	0.491	0.023	0.684	1.635	5.853***

Note: ***, ** and * indicate significant at 1%, 5% and 10% based on *F*-test.

Table 2: Stationarity Test

Variables	ADF Test	PP Test	Variables	ADF Test	PP Test
Indo-FSI	–4.171***	–4.137***	Indo–IP	–5.656***	–8.411***
Mal-FSI	–2.953**	–3.265**	Mal-IP	–5.281***	–5.578***
Phi-FSI	–3.066**	–3.794***	Phi-IP	–2.824**	–3.189**
Tha-FSI	–3.683***	–6.698***	Tha-IP	–4.147***	–4.125***
Vie-FSI	–2.656*	–2.586*	Vie-INV	–5.073***	–6.492***

Note: ***, ** and * indicate significant at 1%, 5% and 10% based on *t*-test.

Table 3: Test for Linearity

Country	Indonesia	Malaysia	Philippines	Thailand	Vietnam
Lag order (*p*)	1	1	1	2	2
Threshold lag (*d*)	1	1	1	1	1
Panel A: LR Test for Linearity Against Two Regimes					
LR statistic	25.39***	18.24*	10.17	27.45*	47.23***
Threshold value	0.22	0.12	0.42	0.5	–0.36
Panel B: LR Test for Linearity Against Three Regimes					
LR statistic	31.81*	25.13	15.62	62.49***	72.79***
Threshold value 1	–0.22	–0.3	0.1	–0.46	–0.36
Threshold value 2	0.22	0.12	0.42	0.5	0.01
Panel C: LR Test for Two Regimes Against Three Regimes					
LR statistic	6.42	6.89	5.45	35.04***	25.55

Note: ***, ** and * indicate significant at 1%, 5% and 10%.

regimes, and not significant for the LR test for two regimes vs three regimes for Indonesia. It illustrates the presence of two regimes and a large threshold. Except for the LR test for linearity against two regimes, which has a *p*-value of 0.08, all *p*-values for Malaysia are non-significant. The two-regime model is shown to be statistically insignificant. There is no statistical evidence for a threshold in the Philippines because all LR test *p*-values are more than 10%. In Thailand, the results of LR testing show that both one and two thresholds exist, with the model with two thresholds being superior.

4.5. Transmission of Financial Instability to the Economic Activity for ASEAN Developing Countries

The study employs the mean of Koop et al. (1996) GIRF (General impulse response function) to examine the transmission of financial instability on economic activity in this section. To begin, a nonlinear IRF for a one-unit positive shock to the financial stress index is calculated with the goal of describing how unpleasant financial shocks are transmitted differently across regimes. Then, to clarify the asymmetric feature of this mechanism, negative financial shocks were added to the GIRF simulation.

Figure 2 displays the effect of a one-unit shock to the financial stress index on the economic activity index and its own in a high-stress regime and a low-stress regime.

The financial stress index responds positively to a single financial shock in both high-stress and low-stress regimes and for all countries, but the magnitude differs between regimes. We can see that the responses of the financial stress index in Indonesia, Malaysia, and the Philippines decrease more quickly in high-stress situations than in normal times. This is due to the policy responses that these countries took when the Asian financial crisis struck in 1997. In the instance of Thailand, there are three different TVAR regimes to consider. Because the GIRF results in two lower regimes are similar yet significantly different from the highest regime, we will refer to the second lower regime as the low-stress regime and the highest regime as the high-stress regime from now on. Although Thailand was similarly affected by the crisis, the response was not the same. Financial stress has a far stronger and longer effect in a high-stress condition than it does in a low-stress state. Because of the domestic political upheaval at the time, the authorities reacted slowly and without direction during the global financial crisis of 2008. Because Vietnam was spared the Asian financial crisis, it can be seen that the responses to financial stress are similar across regimes.

The findings show that a financial shock has a negative impact on economic activity. A reduction in economic activity occurs when financial stress rises. For comparison, the impulse responses of economic activity in both regimes are shown in a single plot (see Figure 2). First, we can see that under a high-stress regime, Indonesia's IP responds strongly and significantly to a one-standard-deviation financial shock, whereas in a low-stress regime, it responds weakly and insignificantly. The drop proportion of IP in the high-stress regime is around twice that in the low-stress regime at its maximum level in the fourth month (–0.036 percent versus –0.02 percent). In both regimes, it decreases after that and is near to zero after twenty months.

Malaysia's IP response pattern is identical to that of Indonesia. In the third month, the reaction of IP in the high-

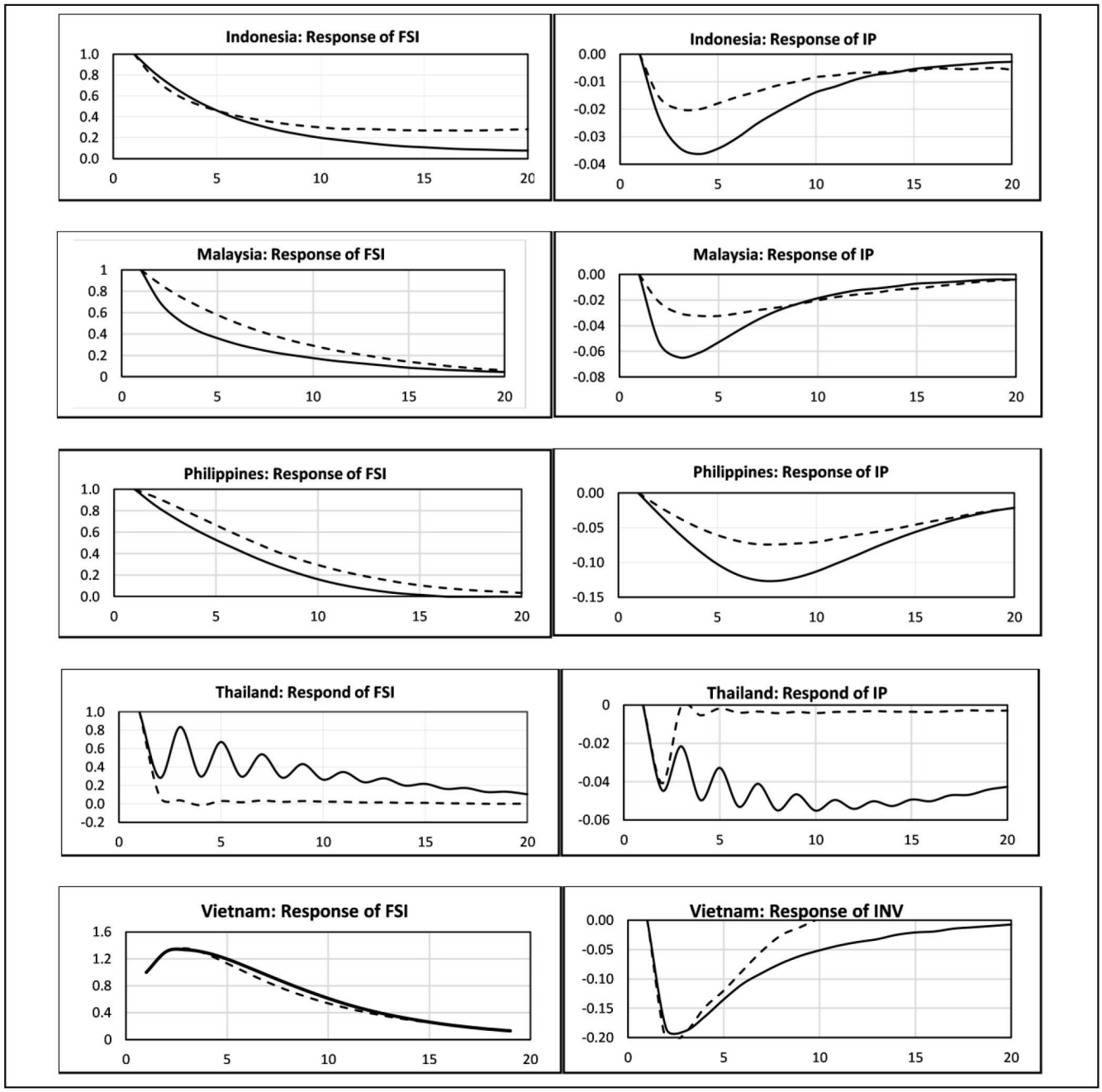

Figure 2: Responses of Financial Stress and Economic Activity to an FSI Shock in High-Stress Regime (Solid Line) and Low-Stress Regime (dotted line)

stress regime is more than double that of the lower-stress regime (0.065 percent against 0.03 percent), and it erodes after 20 months. Although there is no statistical evidence of nonlinearity in the Philippines, the results indicate a similar pattern. In the model for Thailand, there are three stress regimes, with impulse responses in the two lower regimes being identical. As a result, We classify two lower regimes as low-stress and the uppermost regime as high-stress. The IP reaction to financial stress in both regimes is comparable, reaching 0.04 percent after two months, as seen in the graph.

The response in a high-stress environment is then stronger and more persistent than in a low-stress environment. Finally, similar to Thailand, the response of INV to a financial shock in Vietnam is approximate in both regimes and reaches 0.2% after two months. However, the high-stress response is significantly more long-lasting.

Even though the answers analyzed differ by country, it shows that the transmission of financial instability to economic activity is state-dependent. This empirical evidence is consistent with previous research. The economy is resilient to severe exogenous shocks in normal times because non-financial borrowers have enough time to recoup their losses. Endogenous risks are activated in times of high stress, amplifying shocks and reinforcing the relationship between financial stress and the real economy.

Table 4 shows the cumulative response of economic activity to a positive and negative one-unit financial shock over 20 months in terms of shock signs. It demonstrates that in a high-stress environment, a positive shock that increases financial stress has a greater influence on economic activity than in a low-stress environment. In high-stress regimes, a negative shock, which reduces financial stress, has a bigger impact than in low-stress regimes. A one-unit negative shock to FSI, on the other hand, has a smaller impact on economic activity than a one-unit positive shock. Malaysia, Thailand, Vietnam, and, to a lesser extent, Indonesia, all fall into this category. In the case of the Philippines, the answers are insignificant.

This finding differs from that of certain studies conducted in wealthy countries. According to Mittnik and Semmler (2013), a negative shock has a bigger impact on economic activity than a positive shock in the US and large EU nations. According to Van Roye (2014), the effects of a positive and negative financial shock on German economic activity are comparable.

In conclusion, data from nonlinear impulse response analysis reveals that diverse transmission channels of financial instability on economic activity exist. When financial instability reaches a certain level, economic activity begins to decline dramatically. A shock to the financial sector that reduces instability can boost the economy's performance, although on a smaller scale than a shock that increases financial instability.

5. Conclusion

The purpose of this study was to look into the impact of financial instability on economic activity in five ASEAN developing economies: Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. The financial stress index is used to assess financial instability. Financial factors from four key financial sectors, including the banking sector, stock market, bond market, and foreign currency market, are combined. Financial stress index performance for all countries can reflect past events of financial sector threats in each country.

The TVAR model is then used to assess how financial instability affects economic activity. The findings are divided into three categories. To begin with, there is strong evidence that financial instability can lead to a drop in economic activity in most nations, except the Philippines.

Second, the impact of financial instability on economic activity varies depending on the financial sector's level of stress. In a high-stress situation, the contraction in economic activity is much stronger and lasts longer than in a low-stress situation. Third, when financial instability decreases, economic activity improves. And it happens more frequently during times of extreme financial stress than it does in normal times.

The findings have significant policy implications. The financial stress index, it is suggested, should be used as an early warning indication of economic contraction and rigorously monitored if it surpasses a certain threshold for ASEAN emerging countries. When the economy is in a high-stress situation, however, new measures capable of lowering financial market stress should be considered in addition to traditional monetary policies. Following the onset of the global financial crisis in 2008, central banks in industrialized

Table 4: Cumulative Response Of Economic Activity After 20 Months to a Positive and Negative One-Unit Financial Shock

Country	Indonesia	Malaysia	Philippines	Thailand	Vietnam
Economic Activity Response to a Positive Shock					
Low-stress regime	–0.19	–0.38	–0.38	–0.1	–0.76
High-stress regime	–0.29	–0.51	–0.51	–0.89	–1.28
Economic Activity Response to a Negative Shock					
Low-stress regime	0.37	0.15	0	–0.08	0.41
High-stress regime	0.25	0.43	0.09	0.5	0.72

countries utilized unorthodox monetary policy to encourage economic activity. The scale of the policy response is the key source of concern.

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