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THE RELATIONSHIP BETWEEN FINANCIAL DEVELOPMENT, ECONOMIC GROWTH, AND INFLATION: EVIDENCE FROM SOUTHEAST ASIA

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ABSTRACT

This study examines the relationship between financial development, economic growth, and inflation five developing Southeast Asian countries between 1997 and 2016 using a vector autoregressive model. The results revealed that: inflation positively affected money supply and stock market capitalization, but GDP per capita growth rate negatively; GDP per capita growth rate was positively correlated with domestic credit to the private sector; money supply positively affected stock market capitalization and inflation; domestic credit to the private sector exerted a positive influence on GDP per capita growth rate, but negative on inflation; and stock market capitalization was negatively related to inflation. Further, a directional relationship runs from GDP per capita to inflation, from inflation to money supply, and from inflation to domestic credit to the private sector. Policies are recommended to promote economic growth, reduce inflation, and achieve sustainable development in Southeast Asia. First, inflation should be carefully controlled as it causes a decline in the GDP per capita growth rate. Second, GDP per capita growth rate should be promoted owing to its positively effect on domestic credit to the private sector, which has been an important catalyst for economic growth in Southeast Asia over recent decades. Finally, domestic credit to the private sector and stock market capitalization should be fostered because of their contribution to reducing inflation and increasing the GDP per capita growth rate.

Contribution/Originality: This study contributes to the existing literature by clarifying the causal relationship between financial development, economic growth, and inflation in five developing Southeast Asian countries between 1997 and 2016, using a vector autoregressive model.

1. INTRODUCTION

In recent years, economic and financial systems in Asia have faced obstacles in consisting of vulnerable macroeconomic fundamentals, foreign capital inflows, and bank-dominated financial systems with weak risk management (Shimada and Yang, 2011). Unlike the movement of goods, services, and people, finance is less dependent on distance; therefore, the economically advanced members of the Association of Southeast Asian Nations (ASEAN), find it easier to integrate with developed countries outside the region than with neighboring nations (Lee and Takagi, 2015). Although the liberalization of financial services and capital accounts, and the development of capital markets have fostered the integration of ASEAN financial markets, it is still difficult to discern recent financial conditions because of increased financial globalization during the 1990s (Rillo, 2018).

The determinants of financial development have been widely discussed by scholars recently. Key indicators include gross domestic product (GDP) per capita, the level of GDP, and the inflation rate: countries with a higher level of GDP per capita need more sophisticated financial systems to support the economy, leading to greater financial development (Dekle and Pundit, 2016). Dewi *et al.* (2018) investigated the relationship between financial development, economic growth, and poverty alleviation in Indonesia, while Lerohim *et al.* (2014) used a fixed effect model to assess the effect of financial development on economic growth in ASEAN countries. Although existing studies argue that it is necessary to improve the financial sector to reduce inflation and foster economic growth in Southeast Asian countries, none use the vector autoregressive (VAR) model to examine the causality between financial development, economic growth, and inflation. What is the relationship between these three variables in Southeast Asia, and how do they correlate in the short and long term? This study aims therefore to bridge the existing research gap: specifically, its major contribution is in justifying the causal relationship between financial development, economic growth, and inflation of five developing countries in Southeast Asia between 1997 and 2016. More importantly, policies are recommended to facilitate financial development and economic growth, and reduce inflation in Southeast Asia.

This paper is structured as follows: Section 2 presents the empirical review, Section 3 the methodology, Section 4 the results and their discussion, and finally, conclusions and policy implications are summarized in Section 5.

2. EMPIRICAL REVIEW

Some studies have reviewed the relationship between financial development and economic growth in recent years. Akinci *et al.* (2014) examined the correlation between the two in OECD countries from 1980 to 2011, finding a unidirectional causal relationship from economic growth to the three proxy financial development variables and a bidirectional one between the former and broad measure of money. Likewise, Akinboade and Kinfack (2014) investigated the relationship between financial development, economic growth, and millennium development goals in South Africa between 1993 and 2002, discovering that access to private sector credit and increasing per capita incomes were correlated to better health outcomes, while long-term relationships exist between per capita spending on food, per capita income, and financial sector development. A study by Hsueh *et al.* (2013) also assessed the causality between economic growth and financial development in 10 Asian countries from 1980 to 2007 and a directional relationship in which financial development contributes to economic growth in all countries, especially China.

Further, Habibullah and Eng (2006) investigated the relationship between financial development and economic growth over the period 1990–1998 in 13 developing Asian countries, in which they concluded that the former positively affects the latter. Similarly, Muhammad *et al.* (2016) examined the effects of financial development on economic growth in Gulf Cooperation Council (GCC) countries between 1975 and 2012 and proved that foreign direct investment, fixed capital formation, and oil production had a positive impact on economic growth. In addition, Fase and Abma (2003) studied the correlation between financial development and economic growth in Asian countries for 1974–1999 and found causality from financial structure to economic development.

Moreover, a study by Guru and Yadav (2019) examining the relationship between financial development and economic growth for five major emerging economies—Brazil, Russia, India, China, and South Africa—between 1993 and 2014, discovered that the principal indicators of financial development and macroeconomic variables revealed considerable differences between those economies: both credit-to-deposit ratio and domestic credit to private sector, as well as value of shares traded, were positively and significantly correlated with economic growth. Likewise, Bist (2018) investigated the long-term relationship between financial development and economic growth in 16 low-income countries for the period 1995–2014. Their results indicated not only a cross-sectional dependence across the countries but also long-term cointegration between financial development and economic growth: financial development exerting a positive and significant effect on economic growth. Ridzuan *et al.* (2018) also

assessed the impact of financial development and inflation on economic growth in Malaysia from 1985 to 2010 and demonstrated the validity of inflation-led growth nexus, which made a greater contribution to Malaysian economy growth than either financial development or other selected macroeconomic factors.

To conclude, Dewi *et al.* (2018) studied the relationship between financial development, economic growth, and poverty alleviation in Indonesia for the period 1980–2015, finding a unidirectional causality from the financial sector to poverty alleviation and a bidirectional one between the latter and economic growth. Finally, a study by Lerohim *et al.* (2014) examining the impact of financial development on economic growth in ASEAN countries between 2002 and 2011 indicated that while share investment and inflation made an important contribution to economic growth, financial depth had no effect.

3. METHODS

3.1. Data and Sources

To investigate the causal relationship between financial development, economic growth, and inflation, panel data was extracted from the World Development Indicators database released by the World Bank. Specifically, five developing countries in Southeast Asia were selected: Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam. Data covering the period 1997–2016 was then collected, resulting in a total of 100 observations for analysis. Panel data was used because of the following advantages: (1) a large sample provides a greater degree of freedom, more information, and less multicollinearity among variables; and (2) constraints related to controlling for individual or temporal heterogeneity faced by cross-sectional data can be overcome (Hsiao, 2014).

3.2. The Vector Autoregressive (VAR) Model

The VAR model was chosen for this study because it explains the endogenous variables through their own history only, apart from deterministic regressors; therefore, this method incorporates non-statistical, a priori information (Pfaff, 2008). Further, this is a popular model in economics and other sciences, as it is simple and flexible to use with multivariate time-series data (Suharsono *et al.*, 2017).

The VAR model can be defined as follows (Pfaff, 2008):

$$Y_t = A_1 Y_{t-1} + \cdots + A_p Y_{t-p} + \varepsilon_t \qquad (1)$$

where: Y_t denotes a set of K, or endogenous, variables (i.e., money supply, domestic credit to private sector, stock market capitalization, GDP per capita growth rate, and inflation rate); A_i represents (K x K) coefficient matrices for i = 1,…, p; and ε_t is a K-dimensional process with $E(\varepsilon_t) = 0$.

Stability is an important characteristic of the VAR model, which generates stationary time series with time-invariant means, variances, and covariance structure, given sufficient starting values. This characteristic can be checked with the following equation:

$$\det(I_k - A_1 z - \cdots - A_p z^p) \neq 0 \; for \; [z] = 1 \qquad (2)$$

where: I_k denotes the number of orders; A_i represents (K x K) coefficient matrices for i = 1,…, p; and z represents the number of roots.

If the solution for Equation 2 produces a root of z = 1, then either some or all variables in the VAR(p) process are integrated of order one, i.e., I(1).

The stability of an empirical VAR model can also be analyzed using the companion form and calculating the eigenvalues of the coefficient matrix. Thus, a VAR model may be specified as follows (Pfaff, 2008):

$$\varepsilon_t = A\varepsilon_{t-1} + V_t \qquad (3)$$

where: $\mathcal{E}_t$ denotes the dimension of the stacked vector; A represents the dimension of the matrix (K_p x K_p); and V_t represents (K_P x 1).

Indicators for Equation 3 can be calculated as follows:

$$\mathcal{E}_t = \begin{bmatrix} Y_t \\ \vdots \\ Y_{t-p+1} \end{bmatrix}; A = \begin{bmatrix} A_1 & A_2 & \dots & A_{p-1} & A_p \\ I & 0 & \dots & 0 & 0 \\ 0 & I & \dots & 0 & 0 \\ \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & \dots & I & 0 \end{bmatrix}; V_t = \begin{bmatrix} U_t \\ 0 \\ \vdots \\ 0 \end{bmatrix} \quad (4)$$

Table-1. Description of Covariates in the VAR Model.

Variable definitions	Unit
The broad money supply as a percentage of GDP[a]	%
The total domestic credit to the private sector as a percentage of GDP[b]	%
The stock market capitalization as a percentage of GDP[c]	%
GDP per capita growth rate	%
Inflation rate	%

Notes:
[a] used to measure the real size of a country's financial sector.
[b] used to measure the financial depth.
[c] used to measure market development.

Table 1 presents the three indicators used to measure financial development: the broad money supply, for the financial sector's real size; total domestic credit to the private sector, for financial depth; and stock market capitalization, for market development.

In this study, there are six steps to the VAR model procedure: (1) performing the unit root test; (2) determining lag length; (3) estimating the VAR model; (4) testing the Granger causality; (5) checking the stability of the eigenvalues; and (6) conducting the Johansen test for cointegration. The VAR model was estimated using the Stata/MP 14.2 software.

4. RESULTS AND DISCUSSION

4.1. Financial Development, Economic Growth, and Inflation in Southeast Asia: An Overview

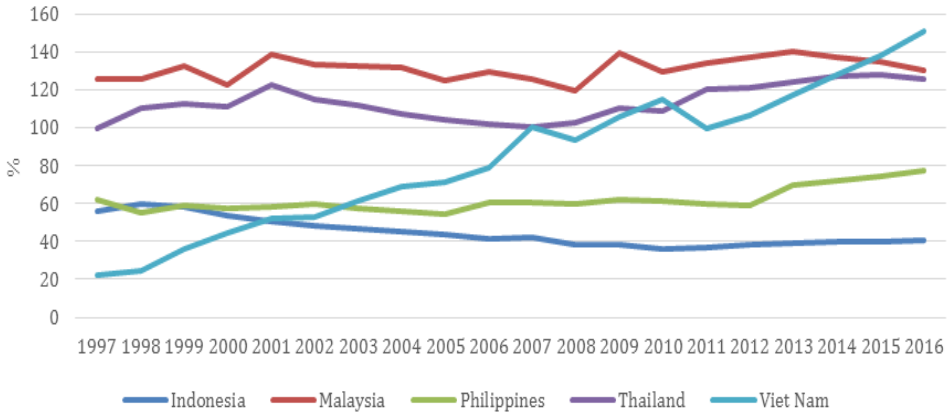

Figure-1. Broad Money Supply of Selected Countries in Southeast Asia.
Source: World Bank (2019).

Over the two decades shown in Figure 1, broad money supply in Southeast Asia is dominated by Malaysia, while from 1997 to 2016, it had declined by about 20% in Indonesia and significantly increased more than seven times, from about 22% to over 150%. This suggests that a large amount of capital is supplied to the market in Viet Nam in response to the rising demand for credit capital from enterprises and individuals to run their businesses.

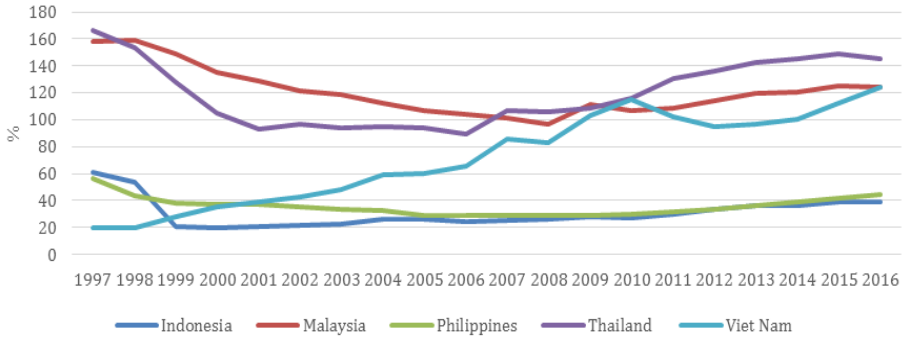

Figure-2. Domestic Credit to the Private Sector of Selected Countries in Southeast Asia.
Source: World Bank (2019).

Figure 2 shows the rate of domestic credit to the private sector in Southeast Asia was dominated by Malaysia from 1997 to 2009, when Thailand took the lead, reaching over 145% by 2016. The rate of domestic credit also rapidly increased in Viet Nam between 1997 and 2016 by more than seven times, from about 20% to over 123%, in contrast to tendency for decline in the Philippines. The implication, therefore, is that the private sector's demand for credit is rising in Thailand, Malaysia, and Viet Nam, where the private sector has played an important role in facilitating the economy.

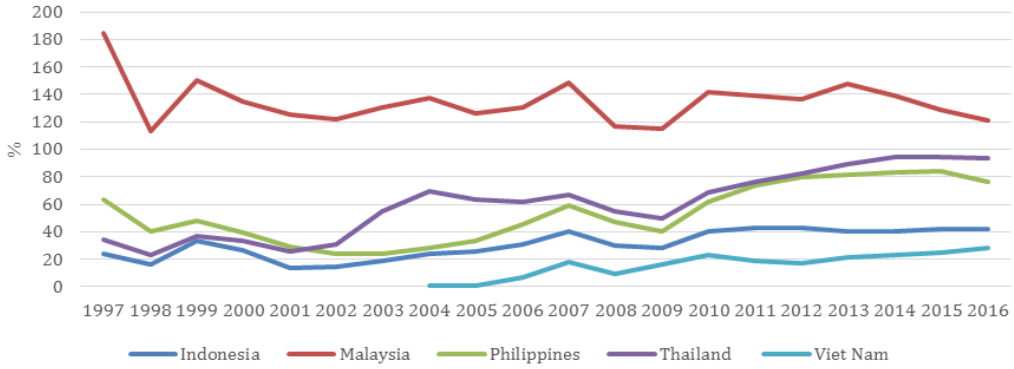

Figure-3. Stock Market Capitalization of Selected Countries in Southeast Asia.
Source: World Bank (2019).

Figure 3 shows the stock market capitalization in Malaysia sharply declined by about 60%, from over 180% in 1997 to 120% in 2016; however, in Thailand and the Philippines it significantly increased over the same period, by about 60% and 20%, respectively. Thus, in addition to the banking sector, the stock market now provides capital to economies in this region.

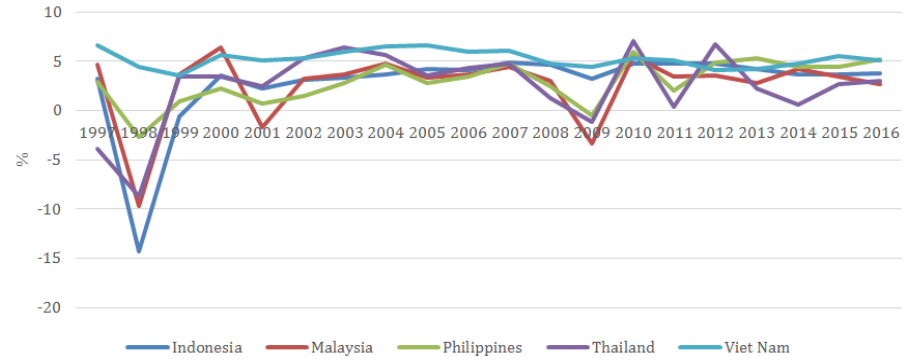

Figure-4. GDP per Capita Growth Rate of Selected Countries in Southeast Asia.
Source: World Bank (2019).

Except for Viet Nam in 1998 and 2009 and Indonesia in 2009, the GDP per capita growth rate of all countries display minus values in 1998 and 2009 in Figure 4, owing to the vulnerability effects of the 1997 Asian and 2008 global financial crises. Conversely, the GDP per capita growth rate in Viet Nam varied between 4% and 6% between 1997 and 2016 because of macroeconomic stability and slow economic integration, enabling the adverse effects of both financial crises to be avoided.

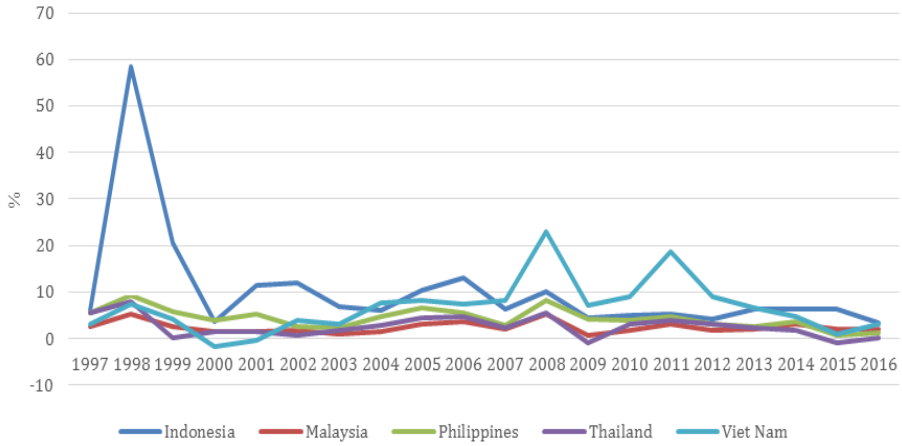

Figure-5. Inflation Rate of Selected Countries in Southeast Asia.
Source: World Bank (2019).

As illustrated in Figure 5, the negative effects of the two financial crises resulted in Indonesia's inflation rate reaching a peak around 60% in 1998 and above 23% in Viet Nam in 2008. Over the entire period, Thailand had the lowest inflation rate, declined rapidly by about 8%.

Table-2. Characteristics of Financial Development, Economic Growth, and Inflation of Selected Countries in Southeast Asia.

Variables	Mean	SD	Min	Max
Money supply	86.82	36.60	22.50	151.10
Domestic credit to the private sector	75.90	44.39	19.80	166.50
Stock market capitalization	57.82	45.60	0.00	184.50
GDP per capita growth rate	3.17	3.28	-14.30	7.00
Inflation rate	5.28	6.73	-1.70	58.50

Note: SD denotes standard deviation.
Source: Author's calculation, 2019.

It is evident from Table 2 that the average proportion of money supply, domestic credit to the private sector, and stock market capitalization in Southeast Asian countries accounts for around 87%, 76%, and 58%, respectively. Further, GDP per capita growth and inflation rates account for 3.2% and 5.3%, respectively.

4.2. The Relationship between Financial Development, Economic Growth, and Inflation in Southeast Asia

4.2.1. Performing the Unit Root Test

The unit root test checks the stationarity or non-stationarity of the time-series variables (Adeola and Ikpesu, 2016). This study used the Augmented Dickey–Fuller (ADF) test to examine the stationarity of all five variables shown in Table 3 and the following hypotheses:

Null hypothesis (H_0): The variables contain a unit root.

Alternative hypothesis (H_a): The variables do not contain a unit root.

Table-3. The ADF Test for the Unit Root.

Variables	Level	1st difference	2nd difference
LnMoney supply	t-statistic: -2.38 p-value: 0.14 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	t-statistic: -2.54 p-value: 0.10 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	t-statistic: -2.37 p-value: 0.14 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58
LnDomestic credit to the private sector	t-statistic: -2.29 p-value: 0.17 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	T-statistic: -2.56 p-value: 0.10 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	t-statistic: -2.63 p-value: 0.08 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58
LnStock market capitalization	t-statistic: -2.26 p-value: 0.18 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	t-statistic: -2.45 p-value: 0.12 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	t-statistic: -2.17 p-value: 0.21 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58
LnGDP per capita growth rate	t-statistic: -8.14 p-value: 0.00 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	t-statistic: -5.36 p-value: 0.00 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	t-statistic: -3.66 p-value: 0.00 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58
LnInflation rate	t-statistic: -5.75 p-value: 0.00 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	t-statistic: -5.05 p-value: 0.00 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	t-statistic: -3.61 p-value: 0.00 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58

Source: Author's calculation, 2019.

The results in Table 3 show that the null hypothesis cannot be rejected because all the p-values are greater than the critical values at 1%, 5%, and 10%, implying that all the variables exhibit a unit root.

4.2.2. Determining Lag Length

The objective of this second step is to identify the optimal lag for the VAR model. If the lag is too small, then the residual of the regression will not show white noise and, as the result, the actual error will not be accurately estimated by the model (Suharsono *et al.*, 2017).

Table-4. Selection of the Lag Length.

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-411.430				0.004	8.675	8.729	8.809
1	-140.660	541.520	25	0.000	0.000	3.555	3.879*	4.356*
2	-115.250	50.830	25	0.002	0.000	3.546	4.140	5.016
3	-82.390	65.710*	25	0.000	0.000*	3.383*	4.247	5.520
4	-71.430	21.920	25	0.640	0.000	3.675	4.809	6.480

Endogenous: LnMoney supply; LnDomestic credit to the private sector; LnStock market capitalization; LnGDP per capita growth rate; LnInflation rate
Exogenous: Constant
Number of observations = 96

Notes: * denotes lag order selected by the criterion; LL—log-likelihood values; LR—sequential modified likelihood ratio test statistics; FPE—final prediction error; AIC—Akaike information criterion; HQIC—Hannan–Quinn information criterion; SBIC—Schwarz's Bayesian information criterion.
Source: Author's calculation, 2019.

The results in Table 4 suggest that the optimal lag is 3 (the number of lags is equal to 3) as recommended by the FPE and AIC indicators that are less than 1 as recommended by the HQIC and SBIC indicators. Therefore, lag 3 was chosen to run the VAR model in the next step.

4.2.3. Estimating the VAR Model

The findings of the third step revealed the positive effects of: inflation rate on money supply and stock market capitalization, and money supply on stock market capitalization and inflation rate; GDP per capita growth rate on domestic credit to the private sector, and vice versa. On the other hand, negative effects were found for: inflation rate on GDP per capita growth rate, and vice versa; stock market capitalization on inflation rate (see details in Table A1 of the Appendix).

4.2.4. Testing the Granger Causality

The Granger causality assesses the predictive capacity of a single variable on the others(Musunuru, 2017), and was used in this study to test several hypotheses:

The relationship between the money supply and other variables:

Null hypothesis (H_0): The money supply does not cause domestic credit to the private sector, stock market capitalization, GDP per capita growth, or inflation Alternative hypothesis (H_a): The money supply causes domestic credit to the private sector, stock market capitalization, GDP per capita growth, and inflation.

The relationship between domestic credit to the private sector and other variables:

Null hypothesis (H_0): Domestic credit to the private sector does not cause money supply, stock market capitalization, GDP per capita growth, or inflation.

Table-5. Results of the Granger Causality Wald Test.

Directional relationship	Probability	Conclusion
Money supply ⟶ Domestic credit	0.63 > 0.05	Accept H_0
Money supply ⟶ Stock market capitalization	0.84 > 0.05	Accept H_0
Money supply ⟶ GDP per capita growth	0.38 > 0.05	Accept H_0
Money supply ⟶ Inflation	0.21 > 0.05	Accept H_0
Domestic credit ⟶ Money supply	0.69 > 0.05	Accept H_0
Domestic credit ⟶ Stock market capitalization	0.85 > 0.05	Accept H_0
Domestic credit ⟶ GDP per capita growth	0.07 > 0.05	Accept H_0
Domestic credit ⟶ Inflation	0.50 > 0.05	Accept H_0
Stock market capitalization ⟶ Money supply	0.30 > 0.05	Accept H_0
Stock market capitalization ⟶ Domestic credit	0.92 > 0.05	Accept H_0
Stock market capitalization ⟶ GDP per capita growth	0.47 > 0.05	Accept H_0
Stock market capitalization ⟶ Inflation	0.06 > 0.05	Accept H_0
GDP per capita growth ⟶ Money supply	0.67 > 0.05	Accept H_0
GDP per capita growth ⟶ Domestic credit	0.10 > 0.05	Accept H_0
GDP per capita growth ⟶ Stock market capitalization	0.07 > 0.05	Accept H_0
GDP per capita growth ⟶ Inflation	0.00 < 0.05	Reject H_0
Inflation ⟶ Money supply	0.00 < 0.05	Reject H_0
Inflation ⟶ Domestic credit	0.01 < 0.05	Reject H_0
Inflation ⟶ Stock market capitalization	0.12 > 0.05	Accept H_0
Inflation ⟶ GDP per capita growth	0.46 > 0.05	Accept H_0

Source: Author's calculation, 2019.

Alternative hypothesis (H_a): Domestic credit to the private sector causes money supply, stock market capitalization, GDP per capita growth, and inflation.

The relationship between stock market capitalization and other variables:

Null hypothesis (H_0): Stock market capitalization does not cause money supply, domestic credit to the private sector, GDP per capita growth, or inflation.

Alternative hypothesis (H_a): Stock market capitalization causes money supply, domestic credit to the private sector, GDP per capita growth, and inflation.

The relationship between GDP per capita growth and other variables:

Null hypothesis (H_0): GDP per capita growth does not cause money supply, domestic credit to the private sector, stock market capitalization, or inflation.

Alternative hypothesis (H_a): GDP per capita growth causes money supply, domestic credit to the private sector, stock market capitalization, and inflation.

The relationship between inflation and other variables:

Null hypothesis (H_0): Inflation does not cause money supply, domestic credit to the private sector, stock market capitalization, or GDP per capita growth.

Alternative hypothesis (Ha): Inflation causes money supply, domestic credit to the private sector, stock market capitalization, and GDP per capita growth.

As can be seen from Table 5, there is a directional relationship from GDP per capita growth to inflation, from inflation to money supply, and from inflation to domestic credit to the private sector.

4.2.5. Checking the Stability of Eigenvalues

If all the eigenvalues lie inside the unit circle, then the VAR model satisfies the stability condition (see Figure 6).

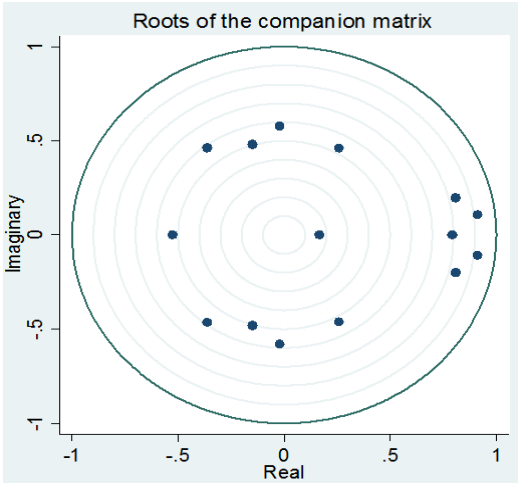

Figure-6. Checking the Stability of Eigenvalues in the VAR Model.

Source: Author's calculation, 2019.

4.2.6. Conducting the Johansen Test for Cointegration

This final step examined the long-term relationship among variables. If variables are cointegrated, then a long-term relationship among variables is possible (Musunuru, 2017).

The following hypotheses were tested:

Null hypothesis (H_0): There is no cointegration among variables.

Alternative hypothesis (H_a): There is cointegration among variables.

In this study, the Johansen cointegration test was performed using the trace statistic, which is a likelihood ratio-type test that operates under different assumptions in the deterministic part of the data generation process (Lütkepohl *et al.*, 2001).

Table-6. Results of Trace Statistic in the Johansen Cointegration Test.

Maximum rank	LL	Eigenvalue	Trace statistic	5% critical value	1% critical value
0	-184.39		96.49	68.52	76.07
1	-161.48	0.37	50.67*1	47.21	54.46
2	-149.66	0.21	27.05*5	29.68	35.65
3	-144.05	0.10	15.81	15.41	20.04
4	-138.97	0.09	5.65	3.76	6.65
5	-136.14	0.05			

Notes: *1 and *5 denote the number of cointegrations (ranks) chosen to accept the null hypothesis at 1% and 5% critical values.
Source: Author's calculation, 2019.

Table 6 shows that the null hypothesis cannot be rejected in rank 1 (one cointegration) because the trace statistic is less than the 1% critical value (50.67 < 54.46), nor in rank 2 (two cointegrations) where it is less than the 5% critical value (27.05 < 29.68). These results thus imply one cointegration among variables at the 1% critical value and two at the 5% critical value.

4.3. Discussion

Overall, the findings of this study demonstrated: positive relationships between inflation, money supply, and stock market capitalization, and between GDP per capita growth rate and domestic credit to the private sector; and negative ones inflation and each of GDP per capita growth rate, domestic credit to the private sector, and stock market capitalization. Thus, fiscal and monetary policies should be integrated to stabilize the economies of Southeast Asian countries; specifically, inflation should be tightly controlled as it causes a reduction in GDP per capita growth rate, which should be promoted owing to its positive effect on domestic credit to the private sector that has been identified as an important catalyst for economic growth in Southeast Asian in recent decades. Domestic credit to the private sector, along with stock market capitalization, should also be fostered because of their contribution to reducing inflation and promoting GDP per capita growth rate. Hence, a directional relationship runs from GDP per capita growth to inflation, from inflation to money supply, and from inflation to domestic credit to the private sector. Further, there is a long-term relationship among the variables.

These results are consistent with Lerohim *et al.* (2014), who concluded that financial development had supported economic growth in ASEAN countries between 2002 and 2011. However, Tan *et al.* (2017) argued that no significant causal relationship existed between financial depth and economic growth in Viet Nam where credit growth had accelerated within several years, while financial depth negatively affected economic growth in both Laos PDR and Cambodia.

5. CONCLUSION AND POLICY IMPLICATIONS

The study aimed to explore the relationship between financial development, economic growth, and inflation in Southeast Asia from 1997 to 2016, and the results revealed both positive and negative relationships, as detailed in Section 4. Consequently, to stabilize the region's economies, especially in the long term, there needs to be integrated fiscal and monetary policies. First, to control inflation, and hence maintain the GDP per capita growth rate, the commodity markets should be stabilized and marketing channels for goods and services improved. Second, to increase the GDP per capita growth rate, and thus domestic credit to the private sector, which was important for economic growth in Southeast Asia, job creation and development of the private sector are crucial. Finally, to further reduce inflation and support GDP per capita growth, domestic credit to the private sector and stock market capitalization should be fostered.

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APPENDIX

Table-A1. Estimation of the VAR Model.

Variables	Coefficient	Standard Error	t-statistic	p-value
LnMoney supply				
LnMoney supply				
L1	1.013***	0.290	3.430	0.001
L2	0.123	0.410	0.300	0.768
L3	-0.333	0.300	-1.090	0.277
LnDomestic credit to the private sector				
L1	0.014	0.170	0.080	0.935
L2	-0.143	0.240	-0.590	0.556
L3	0.217	0.180	1.200	0.234
LnStock market capitalization				
L1	0.001	0.060	0.020	0.984
L2	-0.059	0.100	-0.590	0.558
L3	0.062	0.070	0.890	0.375
LnGDP per capita growth rate				
L1	0.014	0.040	0.300	0.769
L2	0.013	0.040	0.280	0.776
L3	0.069	0.040	1.520	0.131
LnInflation rate				
L1	0.085**	0.040	2.110	0.038
L2	-0.038	0.040	-0.890	0.374
L3	0.000	0.040	0.000	0.997
Constant	0.313	0.370	0.830	0.411
LnDomestic credit to the private sector				
LnMoney supply				
L1	0.274	0.370	0.730	0.468
L2	-0.003	0.530	-0.010	0.995
L3	-0.315	0.380	-0.810	0.420
LnDomestic credit to the private sector				
L1	0.828***	0.220	3.660	0.000
L2	-0.111	0.300	-0.360	0.719
L3	0.191	0.230	0.830	0.410
Constant	-1.014	0.920	-1.100	0.274
LnGDP per capita growth rate				
LnMoney supply				
L1	0.480	0.630	0.760	0.451
L2	-0.401	0.890	-0.450	0.656
L3	0.331	0.650	0.510	0.615
LnDomestic credit to the private sector				
L1	-0.832**	0.380	-2.190	0.032
L2	0.950	0.520	1.820	0.072
L3	-0.498	0.380	-1.280	0.204
LnStock market capitalization				
L1	-0.037	0.140	-0.260	0.796
L2	0.026	0.210	0.120	0.905
L3	-0.132	0.150	-0.870	0.384
LnGDP per capita growth rate				
L1	0.060	0.100	0.580	0.565
L2	0.182*	0.100	1.820	0.073
L3	0.237**	0.090	2.410	0.018
LnInflation rate				
L1	-0.316***	0.080	-3.650	0.000
L2	0.272***	0.090	2.910	0.005
L3	-0.169*	0.080	-1.930	0.057
Constant	1.195	0.810	1.470	0.146

Table-A1. (Continued.)

LnInflation rate				
LnMoney supply				
L1	-2.573***	0.790	-3.230	0.002
L2	2.249**	1.120	1.990	0.050
L3	0.390	0.820	0.480	0.636
LnDomestic credit to the private sector				
L1	1.323***	0.470	2.770	0.007
L2	-1.918***	0.650	-2.930	0.004
L3	0.445	0.480	0.910	0.364
LnStock market capitalization				
L1	0.177	0.180	0.980	0.332
L2	0.046	0.270	0.170	0.867
L3	-0.325*	0.190	-1.710	0.091
LnGDP per capita growth rate				
L1	0.090	0.130	0.690	0.492
L2	0.169	0.120	1.350	0.182
L3	-0.055	0.120	-0.450	0.656
LnInflation rate				
L1	0.230**	0.100	2.120	0.037
L2	0.110	0.110	0.940	0.350
L3	0.162	0.110	1.470	0.145
Constant	1.050	1.020	1.030	0.307

Notes: L1, L2, and L3 refer to lag 1, lag 2, and lag 3; ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.
Source: Author's calculation, 2019.