



CAUSALITY RELATIONSHIP BETWEEN EXCHANGE RATE AND STOCK PRICE INDEX IN ASEAN-4

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Abstract

This study aims to determine the causal relationship between the exchange rate and stock price index in ASEAN-4 in 2012 to 2020. The four countries used in this study are countries in Southeast Asia which are included in the category of emerging market countries, namely Indonesia, Malaysia, the Philippines, and Thailand. This study uses a quantitative method with a comparative causal approach, through the technical analysis of Vector Autoregression (VAR) to determine whether or not there is a causal relationship between the research variables. This study uses secondary data obtained from publications from institutions. This study found that there is a one-way causality relationship and does not apply the opposite from the stock price index to the exchange rates in Indonesia, Malaysia, and the Philippines in the long and short term. Meanwhile, there is a one-way relationship and does not apply the opposite from the exchange rate to the stock price index in Thailand in the long and short term.

Keywords:

ASEAN; Exchange rate; Stock Price Index

Abstrak

Penelitian ini bertujuan untuk mengetahui hubungan kausalitas diantara nilai tukar dan indeks harga saham di ASEAN-4 pada tahun 2012 hingga 2020. Empat negara yang digunakan dalam penelitian ini adalah negara di Asia Tenggara yang masuk kedalam kategori negara emerging market yaitu Indonesia, Malaysia, Filipina, dan Thailand. Penelitian ini menggunakan metode kuantitatif dengan pendekatan kausal komparatif, melalui teknis analisis Vector Autoregression (VAR) untuk mengetahui ada atau tidak nya hubungan sebab akibat diantara variabel penelitian. Penelitian ini menggunakan data sekunder yang diperoleh dari publikasi lembaga-lembaga. Penelitian ini menemukan hasil penelitian bahwa terjadi hubungan kausalitas satu arah dan tidak berlaku sebaliknya dari indeks harga saham ke nilai tukar di Indonesia, Malaysia, dan Filipina dalam jangka panjang dan jangka pendek. Sedangkan terjadi hubungan satu arah dan tidak berlaku sebaliknya dari nilai tukar ke indeks harga saham di negara Thailand dalam jangka panjang dan jangka pendek.

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INTRODUCTION

The Philippines, Malaysia, Indonesia, and Thailand are among the emerging market countries in Southeast Asia. Emerging Market Economy is described as a country with a low economy to the middle level. It becomes a profit itself like the stock market in these countries because the opportunity to invest is quite good because the growth of Gross Domestic Product (GDP) is faster when compared with developed countries. In addition, stocks in emerging market countries also have a very good return on equity, so dividends and investment returns obtained by investors are also quite high. Investors who transact on the stock exchange are not only domestic investors, but foreign investors are also given access to have share ownership. Increased foreign capital flows will participate in influencing the volatility of the exchange rate as a result of foreign demand and supply in securities trading transactions. Mishkin (2017) defines an exchange rate as the price of a country's currency determined based on the currency of another country. According to Rahardja and Manurung (2008), it defines an exchange rate as a price in another country's currency, to define how much a currency must exchange to obtain a unit of foreign currency.

In the opinion of Martalena and Malinda (2011) the stock price index is an indicator that describes the movement of the stock price. While according to Darmadji and Fakhrudin (2001) the stock price index is an important and main indicator in describing stock price movements. The movement of the stock price index is certainly influenced by several factors such as the economic condition of a country and economic turmoil that occurs in other countries. Economic factors such as currency exchange rate instability are part of the cause of the rise and fall of the stock price index. Controllable exchange rate fluctuation can lead to the performance of public companies listed on the stock exchange and affect the movement of stock prices (Kewal, 2010). So that the stability of the exchange rate becomes very important, especially for public companies engaged in export and import. This is in line with The Novi Permata Indah research, from the results of his research showed that macroeconomic factors from the research variables only Rupiah / USD exchange rate had a significant effect on the IDX composite, while inflation and BI rate had no significant effect on changes in the value of the IDX composite. From these results it is known that only the influence of the Rupiah / USD exchange rate is directly proportional to the composite value of IDX (Indah, 2018).

The relationship between exchange rates and stock price indices focuses more on how much influence the exchange rate has on the stock price index. But the exchange rate is not necessarily a sign for company stocks to react as a result of changes in exchange rates. This is in line with Bartram's (2007) research on companies in similar industries in the United States, that the results of the study showed only 13% of the study sample was significantly affected by changes in exchange rates. According to Maheen Jamil and Naeem Ullah (2013) with their research entitled "Impact of Foreign Exchange Rate on Stock Prices" argues that rising domestic stock prices can be an interest for foreign investors to invest in stocks. Because of the increasing demand for domestic stocks makes the demand for domestic exchange rates, so the currency appreciates.

Based on research conducted by Turgut Türsoy (2017) which investigated the interaction between stock prices and exchange rates by applying monthly data from Turkey. Granger's causality analysis results show that the market has the characteristics of a traditional approach phenomenon in the short term. In the short term the market

indicates that the exchange rate affects the movement of the stock price. In the long run, granger causality test results confirmed a two-way relationship of causality between variables. Therefore, these results in the long run reveal that both approaches (traditional and portfolio) are acceptable to explain changes in stock prices and real exchange rates. Another study from Naeem Muhammad and Abdul Rasheed (2014) found that there is no causality relationship between stock prices and exchange rates in Pakistan and India in both the long and short term. In Bangladesh and Sri Lanka there is a two-way causality relationship between two variables over the long term.

Research from Mostafa Ali and Gang Sun (2017) showed that there is no short-term relationship between stock price indexes and exchange rates in Bangladesh but a causal relationship that runs from the stock market to the foreign exchange market in Pakistan. The findings are also supported by the results of granger causality tests. VECM results prove that there is a long-term relationship between the stock market and the foreign exchange market in India and the stock market adjusts to innovation in the foreign exchange market. The study also found a short-term link from stock prices to exchange rates in India. In this study, researchers were unable to find definitive evidence supporting the portfolio hypothesis or the goods market hypothesis but a mixture of interactions of all theories. The study assumes that the differences in findings among the three developing countries in South Asia are due to differences in institutional arrangements, economic measures, exchange rate regulation and accessibility of foreign capital. Investors should understand the interaction in both financial markets.

The relationship between exchange rates and stock price indices is important to research its development. Judging from the results of previous research, if the facts show the results that the exchange rate and stock price index are related and have a causal relationship of the exchange rate to the stock price index, then in the event of economic turmoil, a decline in the stock price index can be anticipated by controlling the exchange rate. Conversely, if there is a causality relationship between the stock price index and the exchange rate, then the right economic policy strategy can be used as a basis in stabilizing the stock price index. If the two markets/prices are related then investors can use this information to predict market conditions using information in other markets. Therefore, the exchange rate and index of the stock price have an important role for the development of a country and for investors in making decisions before making investments. So it becomes important for policy makers or investors need to know how the relationship between exchange rates and stock price indices. This is useful in avoiding high risk, especially if the issuer has a large market capitalization and most of its shares are controlled by foreign investors.

METHOD

The research methods used in this study use quantitative research methods, with a comparative causal approach. This research approach aims to investigate the possibility of a cause-and-effect relationship by observing existing consequences and then retracing the factors that may be the cause through a data. According to Priyono (2016) comparative causal research is a research activity that seeks information about why there is a cause-and-effect relationship and researchers try to trace back the relationship. The analytical tool used in this study is Vector Autoregression (VAR). VAR is one of the time series methods that are often used in research, especially in economics (Basuki & Prawoto, 2016). VAR is also a very useful analytical tool, both in

understanding the existence of reciprocal relationships between economic variables, and in the formation of structured economic models (Enders, 2004).

The object of the research in this study is the Exchange Rate and Stock Price Index in ASEAN-4. The scope of this study is four countries in Southeast Asia namely Indonesia, Malaysia, Philippines, and Thailand. Researchers examined the four countries because Indonesia, Malaysia, the Philippines, and Thailand are countries that enter the emerging market in Southeast Asia. The type of data used in this study is secondary data. Data sources in research come from institutions. Data on exchange rates is sourced from the websites of Bank Indonesia and the World Bank, while data on the stock price index is obtained from the Yahoo Finance website and the publication of the Indonesia Stock Exchange.

USI RESULTS AND DISCUSSIONS

Fluctuations in exchange rates that cannot be controlled can cause the performance of public companies listed on the stock exchange and affect the movement of stock prices. So that the stability of the exchange rate becomes very important, especially for companies engaged in exports and imports and companies that get loans from abroad. The relationship between exchange rates and stock price indices is not necessarily a sign for company stocks to react as a result of changes in exchange rates because each company exerts a different influence in the event of a change in exchange rate. Based on this, the existence of a portfolio balance theory that states that the stock price index can also have an influence on the exchange rate, so this research is important to see which variables give influence first to other variables.

Stationary Test

Table 1. Stationary Test

Country		Level		<i>First Difference</i>		Stationary	
		ER	Index	ER	Index		
Indonesian	ADF	-2.12352 7	-2.10234 8	-11.1919 5	-7.979968	1 st Difference	
	1%	-3.49252 3	-3.49312 9	-3.49312 9	-3.493129		
	Critical Value	5%	-2.88866 9	-2.88893 2	-2.88893 2		-2.888932
	10%	-2.58131 3	-2.58145 3	-2.58145 3	-2.581453		
	Probability	0.2360	0.2443	0.0000	0.0000		
Malaysia	ADF	-1.59139 6	-2.54066 4	-9.32610 2	-10.60009	1 st Difference	
	1%	-3.49252 3	-3.49252 3	-3.49312 9	-3.493129		
	Critical Value						

Philippines	Critical Value	5%	-2.88866 9	-2.88866 9	-2.88893 2	-2.888932	1 st Difference		
		10%	-2.58131 3	-2.58131 3	-2.58145 3	-2.581453			
	Probability	0.4835	0.1089	0.0000	0.0000				
	ADF	-1.27867 1	-2.75871 9	-11.6248 3	-9.201992				
	Critical Value	1%	-3.49252 3	-3.49252 3	-3.49312 9	-3.493129			
		5%	-2.88866 9	-2.88866 9	-2.88893 2	-2.888932			
	Critical Value	10%	-2.58131 3	-2.58131 3	-2.58145 3	-2.581453			
		Probability	0.6374	0.0678	0.0000	0.0000			
	Thailand	Critical Value	ADF	-1.48235 3	-4.00748 9	-9.78258 4		-10.99981	1 st Difference
			1%	-3.49252 3	-3.49312 9	-3.49312 9		-3.493747	
Critical Value		5%	-2.88866 9	-2.88893 2	-2.88893 2	-2.889200			
		10%	-2.58131 3	-2.58145 3	-2.58145 3	-2.581596			
Probability		0.5388	0.0020	0.0000	0.0000				

Source: Data processed by Eviews 11 SV, 2021

Based on the results of stationarity tests at degree levels in all four countries are not stationary. Because the data is not stationary, differentiation is needed. Differentiation in the first degree of difference shows that the data in Malaysia, the Philippines, Thailand, and Indonesia are already stationary.

Lag Length Determination

Based on calculations on each criterion in the Eviews program that to find out the optimal lag is marked with the sign *(star) then obtained the smallest FPE, AIC, and HQ values in the first lag. The LR, FPE, and AIC criteria for Malaysia are at a fourth lag. While the Philippines has the largest LR values, the FPE and AIC are smallest in the first lag and for Thailand, the criteria LR, FPE, and AIC are at the second lag. So the optimal lag for Thailand is at the second lag.

Kointegration Test

The cointegration test used in this study uses Johansen's Cointegration Test method. Where the criteria in this test are, data is integrated if the value of Trace Statistic and Max-Eigen Statistic is greater than the value of Critical Value (Juanda & Junaidi, 2012).

Table 2. Kointegration Test

Country	Hypothesized No. of CE (s)	Johansen Test				Long-term relationships
		Trace Statistic	Critical Value	Max-Eigen n Statistics	Critical Value	
Indonesian	None*	94.10331	15.49471	63.27485	14.26460	Exist
	At most 1*	30.82846	3.841465	30.82846	3.841465	
Malaysia	None*	49.92700	15.49471	30.21348	14.26460	Exist
	At most 1*	19.71352	3.841465	19.71352	3.841465	
Philippines	None*	90.74712	15.49471	47.07190	14.26460	Exist
	At most 1*	43.67522	3.841465	43.67522	3.841465	
Thailand	None*	96.88369	15.49471	60.23942	14.26460	Exist
	At most 1*	36.64427	3.841465	36.64427	3.841465	

Source: Data processed by Eviews 11 SV, 2021

The results of the cointegration test showed that the four countries studied in trace statistics and max-eigen statistics were greater than critical values. It can be concluded that Malaysia, the Philippines, Indonesia, and Thailand have a long-term relationship.

Estimated Vector Error Correction Model (VECM)

The VECM model is the right model used to estimate because the data in this study is stationary data in first degrees and has a long-term relationship. The following are the results of VECM estimates in each country:

Indonesian

Vecm estimates in Indonesia show the following equation:

$$\Delta ER_t = 71.38103 - 0.092477e_t - 0.617102INDEX_{t-1} - 0.282285ER_{t-1}$$

$$\Delta INDEX_t = 7.103327 + 0.039253e_t + 0.428801INDEX_{t-1} + 0.102082ER_{t-1}$$

From the exchange rate equation it is obtained that there is a negative relationship in the amount of the mark between the stock price index and changes in the rupiah exchange rate. If there is a 1% change in the stock price index in the previous month it will affect the current exchange rate by -0.617102. Then there is the effect of the change in the current rupiah exchange rate of -0.282285, if there is a 1% change in the exchange rate one month earlier. While the stock price index equation can be said that the rupiah exchange rate has an insignificant positive influence on the stock price index in the short term. Then there is the effect of significant positive stock price index changes in the previous month on the current stock price index of 0.428801.

Long-term relationship equations:

$$ER_{t-1} = -2917,991 - 1.890183INDEX_{t-1}$$

In the long run, the variable stock price index has a negative and significant effect on a real level of 5%. Based on the results of the statistical t value estimate of -3.77557 is smaller than -1.982597. This means that if there is a 1% change in the stock price index in the previous month, it will lower the rupiah exchange rate in Indonesia by 1.890183 at this time.

Malaysia

Vecm estimates in Indonesia show the following equation:

$$\Delta ER_t = 0.008499 - 0.034813e_t - 0.000638INDEX_{t-1} + 2.57E-05INDEX_{t-2} - 4.17E-05INDEX_{t-3} - 0.000471INDEX_{t-4} + 0.013579ER_{t-1} + 0.061227ER_{t-2} + 0.075097ER_{t-3} - 0.181116ER_{t-4}$$

$$\Delta INDEX_t = -0.48831 - 13.10909e_t - 0.130730INDEX_{t-1} - 0.153001INDEX_{t-2} - 0.303274INDEX_{t-3} - 0.110244INDEX_{t-4} - 29.84468ER_{t-1} - 6.387275ER_{t-2} + 22.50301ER_{t-3} + 63.88808ER_{t-4}$$

Based on the exchange rate equation, there is a negative and significant influence between the stock price index and the change in the ringgit exchange rate in the first and fourth lags. This means that if there is a 1% change in the stock price index one month earlier will affect the current exchange rate by -0.000638 and if there is a 1% change in the stock price index four months earlier will affect the ringgit exchange rate in the current month of -0.000471. While in the stock price index equation it can be said that the ringgit exchange rate does not significantly affect changes in the stock price index in the short term. Then there is the effect of the change in the stock price index negatively significantly on lag three, meaning that if there is a change of 1% of the stock price index three months earlier it will affect the stock price index in the current month of -0.110244.

Long-term relationship equations:

$$ER_{t-1} = -5.465379 + 0.000957INDEX_{t-1}$$

In the long run, variable stock price indexes have a positive and insignificant effect at a real level of 5%. Based on the results of the statistical t value estimate of 0.59444 is smaller than the t table of 1.982597.

Philippines

Vecm estimates in Indonesia show the following equation:

$$\Delta ER_t = 0.065353 - 0.072005e_t - 0.000230INDEX_{t-1} - 0.200844ER_{t-1}$$

$$\Delta INDEX_t = 21.55429 + 17.39448e_t + 0.112635INDEX_{t-1} - 80.48100ER_{t-1}$$

From the exchange rate equation it is found that there is a significant negative influence of the Philippine Peso exchange rate variable on the current exchange rate change of -0.200844, in case of a 1% change in exchange rate one month earlier. In the stock price index equation both the price index against the stock price index itself and the exchange rate against changes in the stock price index in the short term are not significant.

Long-term relationship equations:

$$ER_{t-1} = -10.44738 - 0.00524INDEX_{t-1}$$

In the long run, the variable stock price index negatively and significantly affects the first lag at a real level of 5% of 0.005246. Based on the results of the statistical t value estimate of -5.66624 is smaller than the table t -1.982597. This means that if there is a 1% decrease in the stock price index in the previous month, it will lower the exchange rate in the Philippines by 0.005246 at this time.

Thailand

Vecm estimates in Indonesia show the following equation:

$$\Delta INDEX_t = 2.646395 - 0.109753et - 0.050561INDEX_{t-1} - 0.150188SET_{t-2} - 35.97587ER_{t-1} - 17,26715ER_{t-2}$$

$$\Delta ER_t = -0.006015 + 0.000493et - 0.001190INDEX_{t-1} + 0.000876INDEX_{t-2} + 0.020625ER_{t-1} - 0.150595ER_{t-2}$$

In the stock price index equation it can be said that the Bath exchange rate significantly exerts an influence on the change in the stock price index at a lag of one of -35.9758. This means that if there is a 1% change in bath exchange rate one month earlier will affect the decline of the current stock price index of 35.9758. In the exchange rate equation both the SET Index variable to the bath exchange rate change and the Bath exchange rate variable against the exchange rate itself in the short term are not significant.

Equations in the long run:

$$INDEX_{t-1} = -113.3779 - 42.34791ER_{t-1}$$

In the long run, the Bath exchange rate variable had an insignificant negative effect on the first lag at a real rate of 5% of -42.34791. Based on the results of the statistical t value estimate of -1.31115 greater than t table -1.982597.

Granger Causality Test

Table 3. Granger Causality Test

Country	Null Hypothesis	Obs	F-Statistic	Probability
Indonesian	ER does not Granger Cause INDEX	107	2.13946	0.1466
	INDEX does not Granger Cause ER		5.23999	0.0241
Malaysia	ER does not Granger Cause INDEX	104	0.39804	0.8096
	INDEX does not Granger Cause ER		2.68689	0.0359

Philippines	ER does not Granger Cause INDEX	107	15.9627	0.6924
	INDEX does not Granger Cause ER		0.15738	0.0001
Thailand	INDEX does not Granger Cause ER	106	1.10871	0.3340
	ER does not Granger Cause INDEX		3.58031	0.0315

Source: Data processed by Eviews 11 SV, 2021

Based on the results of Granger's causality tests in all four countries showed different results. In Indonesia, Malaysia, and the Philippines the probability value of the ER variable against index is greater than a significant rate of 5% so the Ho hypothesis is accepted. While the probability value of the INDEX to ER variable is smaller than the significant rate of 5% so Ho is rejected. So it can be concluded that in Indonesia, Malaysia, and the Philippines there is a one-way relationship from variable stock price index to exchange rate and does not apply otherwise. The results of this study are in line with the portfolio balance theory (Frankel & Dominguez, 1993) as well as research conducted by Rosnawintang (2018) where the results of his research state that there is a one-way causality relationship of the stock price index to affect the exchange rate in Indonesia. This study is not in line with research from Azman-Saini (2006) where the results show there is a one-way relationship from exchange rates to stock price indices and does not apply otherwise in Malaysia. The decline in the stock price index is caused because the exchange rate depreciates, while the stability of the exchange rate becomes important so that the stock price index does not fall deeply.

In Thailand the probability value of the INDEX variable against er of 0.3340 is greater than the significant rate of 5% so the Ho hypothesis is accepted. While the probability value of the ER variable against index of 0.0315 is smaller than the significant rate of 5% so Ho is rejected. So it can be concluded in Thailand there is a one-way relationship from the exchange rate variable to the stock price index and does not apply otherwise. The results of this study are in line with the theory of good market approach (Dornbusch & Stanley, 1980) and in line with research conducted by Dwipraptono Agus Harjito (2009) which states that there is a one-way causality relationship from exchange rates to stock price indices in Thailand. But the results of this study contradict Sulistyandari's research, the results of his research show a one-way causality relationship from stock prices to exchange rates. On a macro basis the impact of currency exchange rate fluctuations on capital markets depends heavily on the level of openness of the domestic economy and the continuity of the trade balance (Abdalla & Murinde, 1997).

CONCLUSIONS AND SUGGESTIONS

Based on the results of the Granger causality test, it can be concluded that there is a one-way causality relationship in the short and long term from variable stock price index to exchange rate and does not apply the opposite to the three ASEAN countries studied, namely Indonesia, the Philippines, and Malaysia. While the opposite relationship

is the existence of a one-way causality relationship in the long and short term from variable exchange rate to index stock price and does not apply otherwise in Thailand.

Based on the results of the study, if the facts show the results that the exchange rate and stock price index are related and have a cause-and-effect relationship from the exchange rate to the stock price index, then in the event of economic turmoil, a decline in the stock price index can be anticipated by controlling the exchange rate. Conversely, if there is a causality relationship between the stock price index and the exchange rate, then the right economic policy strategy can be used as a basis in stabilizing the stock price index. If the two markets/prices are related then investors can use this information to predict market conditions using information in other markets. Therefore, the exchange rate and index of the stock price have an important role for the development of a country and for investors in making decisions before making investments.

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