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Original Article

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Dynamic Relationship between Exchange Rate of Hang Seng Index and LQ45 Index: Before and During COVID-19 Pandemic

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Abstract

This study determines the relationship between the exchange rate, the Hang Seng index and the LQ45 index using the Vector Error Correction Model (VECM) method. The data used weekly data for 4 years from 2017 to 2020, comprising 208 time series data. The data used in this study is secondary data based on the official website, namely idx.co.id, www.investing.com, wwww.yahoofinance.co.id, bi.go.id. The results of this study indicate that the exchange rate with the LQ45 index had a positive and significant effect on the LQ45 index before and during the COVID-19 pandemic. The Hang Seng index with the LQ45 index had a negative and significant effect on the LQ45 index before the COVID-19 pandemic. The Hang Seng index with the LQ45 index did not affect the LQ45 index during the COVID-19 pandemic. The exchange rate with the Hang Seng index had a negative and insignificant effect on the Hang Seng index before the COVID-19 pandemic. The exchange rate with the Hang Seng index had a positive and significant effect on the Hang Seng index during the Covid-19 pandemic. These findings can assist investors in being more selective in determining whether to buy, sell, or hold their shares. The government can make policies related to the exchange rate and maintain the stability of the rupiah exchange rate against the dollar so that the effects can be anticipated and handled as well as possible.

1. Introduction

The Indonesian Capital Market is growing rapidly, as evidenced by the increasing number of investors yearly. The capital market is a way to improve a country's economy because it can provide long-term capital and is directed at increasing public participation in mobilizing funds to expand public financing (Christa & Pratomo, 2013). At the moment, globalization unites market forces that can encourage the development of domestic financial products and securities such as mutual funds, bonds, stocks, and so on (Fahlevi et al., 2019). According to the national economic view of the global economy, if an event occurs in one country, it will affect the economic conditions of other countries. The world is facing a pandemic from the coronavirus or severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), an infection that attacks the respiratory system. Covid-19 first originated in Wuhan, China, at the end of December 2019 and has spread worldwide. The Covid-19 pandemic had a significant impact on bonds and the stock market.

The impact of the COVID-19 pandemic was not only on people's welfare but also on the Indonesian economy because the company will stop every activity to prevent the spread of COVID-19. One of the things affected by this pandemic was shares in companies on the Indonesia Stock Exchange and the company's financial performance. The company's financial performance on the Indonesia Stock Exchange has decreased the LQ45 index (Febriyanti, 2020). The LQ45 index was 45 stocks selected based on high liquidity value and large market capitalization and adjusted every six months, namely February and August, so the stocks in the LQ45 index will always change (Arfah et al., 2020).

The performance of the LQ45 index on the Indonesian stock exchange has decreased during the pandemic, as can be seen from the performance of stocks included in the LQ45 index classification during the pandemic,

because every world economy has experienced a decline, thus affecting the performance of the LQ45 index, at the fact that this stock had a high market capitalization value (Martini & Djohan, 2020). In addition, the risks that investors will face, such as the movement of foreign currency against the rupiah currency, the value of foreign currencies has a strong relationship with stock prices because when the currency's value increases, the IHSG decreases. When the IHSG increases, the currency's value decreases (Choiriyah & Yuliana, 2018). This allows for a diversion of investment from the capital market to the foreign exchange market because investors seek to gain greater profits in the foreign exchange market. Stock investors pay close attention to the development of the rupiah exchange rate to determine investment choices.

Cooperation between countries in the trade sector will affect domestic stock prices. The countries with strong economies will affect the countries with weaker economies. As China will affect Indonesia, this cannot be separated from the intertwined free trade between ASEAN and China (Mutakif & Nurwulandari, 2012). China's influence is mostly through trade routes and commodity prices, whereas Indonesia views China as the main destination for exports of goods, including commodities (Wilis & Nurwulandari, 2020). Hong Kong is Indonesia's export center for handicrafts such as jewellery, fashion, ceramics, batik, home decoration ceramics, furniture, and stationery (Beureukat & Andriani, 2022).

The progress of China's capital market had a higher market capitalization compared to Indonesia, including the development of the Hang Seng Index. The Hang Seng Index consists of 45 companies divided into four sub-indices: Commerce and Industry, Finance, Utilities and Properties. According to Syarofi in research Wicaksono & Yasa (2017) the rise or fall of the Hang Seng Index reflects the performance of the total shares traded. China's economic growth and decline can be seen from the rise and fall of the Hang Seng Index stock price index. The Hang Seng Index is very much in demand because it has a large market capitalization and the largest growth and value compared to other indices. Based on research results (Arfah et al., 2020), (Buana & Haryanto, 2016) show that the Exchange Rate has a positive and significant effect on the LQ45 index. The results of research conducted by Mutakif & Nurwulandari (2012), Sudirman (2018), Wicaksono & Yasa (2017) show the Hang Seng Index has a positive effect on the Composite Stock Price Index on the IDX.

The analytical method used in this research used vector autoregressive (VAR), proposed by Sims in Ajija et al. (2011), who said that economic variables are interrelated. The VAR method describes the past movement of other variables based on the time series and gives a dynamic impact on the equation. By using this VAR method, researchers want to see the relationship between the Exchange Rate variable, the Hang Seng Index and the LQ45 Index before and during the Covid-19 Pandemic.

2. Literature Review

Exchange rate

According to Harsono (2019), The foreign exchange rate is the number of rupiah needed to obtain one unit of foreign currency.

Hang Seng Index

According to Krisnawati & Nursiam (2020), Hang Seng Index (HSI) was the market capitalization index of companies traded on the Hong Kong stock exchange.

LQ45 Index

According to Martini & Djohan (2020), the LQ45 index was the leading stock in Indonesia, consisting of 45 issuers with high liquidity, and selected through several selection criteria.

COVID-19 Pandemic

At the end of 2019, the world was challenged with an outbreak of the coronavirus, or severe acute respiratory syndrome coronavirus 2 (SARS-Co-V-2), an infection that attacks the respiratory system, first discovered in Wuhan, China. On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a pandemic (Shrestha et al., 2020).

3. Materials and Methods

3.1. Data Sources

The data in this research was weekly exchange rate data, the Hang Seng Index and the LQ45 Index for the period 2017 to 2020 so the population in this study consists of 208 time series data. The sample in this study consists of weekly data on Exchange Rates, Hang Seng Index and LQ45 Index from January 2017 to December 2020 where in one year, there are 52 weeks multiplied by 4 years, so the number of samples used is 208 time series data.

3.2. Data Collection

The data used in this study is quantitative in the form of numbers and obtained from secondary data sources in the form of Exchange Rate data, Hang Seng Index, and LQ45 Index from January 2017 to December 2020 published by idx.co.id, www.investing .com, and www.yahoofinance.co.id, bi.go.id.

4. Results and Discussion

The method used to perform the unit root test in this study is the Augmented Dickey-Fuller Test (ADF Test). In the ADF test, if the variable is not stationary at the level, it must be continued with a test for unit root in 1st difference, with the same procedure as at the level.

Table 1. Data Stationarity Test

Before COVID-19			During COVID-19
Variable	Unit Root	ADF Test Statistic	ADF Test Statistic
Exchange rate	I(0)	-1.539	-3.628
	I(1)	-1.193	-7.525
Index of Hang Seng	I(0)	-2.709.	-1.875
	I(1)	-1.241	-6.477
Index of LQ45	I(0)	-2.605	-1.404
	I(1)	-1.193	-5.957

The standard for determining whether or not a data is stationary is the ADF (Augmented Dickey-Fuller) value. If the ADF value is greater than the critical value, then Ho is accepted, which means there is a unit root and it is not stationary. On the other hand, if the ADF value is less than the critical value of 5%, Ho is rejected, meaning there is no unit root and the data is stationary.

4.1. Optimal Lag Test

The optimal lag test is very important in using VAR modelling to eliminate autocorrelation symptoms. The optimal lag test uses the Akaike Information Criterion (AIC) value.

Table 2. Optimal Lag Test

Lag	Before COVID-19	During COVID-19
	AIC	AIC
0	4.315.808	4.180.408
1	3.789.533	39.75941*
2	3.778.118	3.995.595
3	37.72781*	4.009.954
4	3.778.136	-
5	3.781.181	-
6	3.785.988	-
7	3.790.125	-
8	3.789.023	-

The recommended optimal lag is indicated by an asterisk (*).

4.2. VECM Stability Test

The VECM model is stable if all its roots have a modulus less than 1.

Table 3. Result of VECM Stability Test

Before COVID-19		During COVID-19	
Root	Modulus	Root	Modulus
0.954	0.954	0.966	0.966
0.924 - 0.083i	0.928	0.063 - 0.406i	0.410
0.924 + 0.083i	0.928	0.063 + 0.406i	0.410
-0.426	0.426	0.271 - 0.089i	0.285
-0.139	0.139	0.271 + 0.089i	0.285
-0.015	0.015	-0.220	0.220

Table 3 shows the VECM stability test and indicates that the VECM model formed is stable.

4.3. Cointegration Test

Table 4 presents the cointegration test results using Johansen's Cointegration Test method.

Table 4. Comparison of Cointegration Test

Before COVID-19			During COVID-19		
No.of CE(s)	Eigen	Trace	No.of CE(s)	Eigen	Trace
None *	0.105	3.202	None *	0.556	3.821
At most 1 *	0.066	1.603	At most 1	0.238	9.788
At most 2 *	0.041	6.134	At most 2	0.007	0.266

Table 4 shows that by using the 5% significance level, there is at most one cointegrated equation. This can be seen from the trace statistics value, greater than the critical value of 5%.

4.4. Granger Causality Test

Granger causality test results can be seen in the following Table 5:

Table 5. Result of Comparison of Granger Causality Test

Hypothesis	Before Prob.	During Prob.	Decision
Exchange rate does not Granger Cause LQ45	0.0644	0.0002	Not-Yes
LQ45 does not Granger Cause Exchange rate	0.0081	0.0304	Yes-Yes
Index of HANG SENG does not Granger Cause LQ45	0.1747	0.9147	Not-Not
LQ45 does not Granger Cause Index of HANG SENG	0.0448	0.2852	Yes-Not
Index of HANG SENG does not Granger Cause Exchange rate	0.0008	0.1188	Yes-Not
Exchange rate does not Granger Cause Index of HANG SENG	0.3377	0.0011	Not-Yes

Before the pandemic, the Exchange Rate did not affect the LQ45 Index, the LQ45 Index affected the Exchange Rate, the Hang Seng Index did not affect the LQ45 Index, and the LQ45 Index variable affected the Hang Seng Index, the Hang Seng Index affected the Exchange Rate, the Exchange Rate did not affect the Hang Seng Index.

During the Pandemic the Exchange Rate affects the LQ45 Index, the LQ45 Index also affects the Exchange Rate, the Exchange Rate with the LQ45 Index affects each other, the Hang Seng Index does not affect the LQ45, the LQ45 Index does not affect the Hang Seng Index, the Hang Seng Index does not affect the Exchange Rate, the Exchange Rate affects the Index Hang Seng.

4.5. VECM Estimate

The results of the long-term VECM estimation of the Exchange Rate and the Hang Seng Index against the LQ45 Index can be seen in Table 6 as follows:

Table 6. Comparison of Long-Term VECM Estimation Results

Variable	Before COVID-19		During COVID-19	
	t-stats	Effect	t-stats	Effect
Exchange rate	2.53764	Significant positive	6.32346	Significant positive
Index of Hang Seng	-5.28524	Significant negative	0.63273	Not Significant

Table 6 shows the magnitude of the coefficient and its significance. In the long term, the variable that affects LQ45 is the Exchange Rate. The results of the short-term VECM estimation of the Exchange Rate and Hang Seng Index against the LQ45 Index can be seen in the following table:

Table 7. Comparison of Short-Term VECM Estimation Results

Variable	Before COVID-19		During COVID-19	
	t-stats	Effect	t-stats	Effect
Exchange rate <-> Index of LQ45	-1.413	Not Significant	1.275	Not Significant
Index of Hang Seng <-> Index of LQ45	0.738	Not Significant	0.080	Not Significant
Exchange rate <-> Index Hang Seng	-0.884	Not Significant	1.991	Significant positive

Table 7 shows that the Exchange Rate variable with the Hang Seng Index has a positive and significant effect in the short term.

5. Conclusion

This study aims to determine the dynamic relationship between the exchange rate, the Hang Seng index and the LQ45 index before and during the COVID-19 pandemic. In conclusion, this study indicates that the relationship of the exchange rate variable with the LQ45 index before the COVID-19 pandemic has a positive and significant effect on the LQ45 index in the long term. The relationship of the exchange rate variable with the LQ45 index during the COVID-19 pandemic has a positive and significant effect on the LQ45 index in the long term. The relationship between the Hang Seng index and the LQ45 index before the COVID-19 pandemic in the long term has a negative and significant effect on the LQ45 index. The relationship between the Hang Seng index and the LQ45 index during the COVID-19 pandemic in the long term does not affect the LQ45 index. The relationship between the exchange rate and the Hang Seng Index before the COVID-19 pandemic had a negative and insignificant effect on the Hang Seng Index in the short term. The relationship between the exchange rate and the Hang Seng Index during the COVID-19 pandemic in the short term has a positive and significant impact on the Hang Seng Index.

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