

Print ISSN: 2288-4637 / Online ISSN 2288-4645
doi:10.13106/jafeb.2021.vol8.no6.0651

The Impact of Exchange Rate, Bank Indonesia Certificate and Global Indexes on the Composite Price Index (IHSG) in Indonesia

Muhamad YUNANTO¹, Henny MEDYAWATI²

Received: March 10, 2021 Revised: May 08, 2021 Accepted: May 15, 2021

Abstract

The purpose of this study is to analyze the contribution of exchange rates, Bank Indonesia Certificate (SBI), and global stock price indexes toward the Composite Stock Price Index (IHSG), and the shocks caused by the global index to the IHSG. The research variables are HSGI, rupiah exchange rate, and global stock price index, which includes NASDAQ, the Hong Kong stock price index (Hang Seng), the Japanese stock price index (Nikkei 225), and the South Korean stock price index (Kospi). The data used is monthly time-series data from 2008 to 2019. The data used in this study are secondary data obtained from Bank Indonesia publications through www.bi.go.id, the Indonesia Stock Exchange, and Yahoo Finance (finance.yahoo.com). Following the type of data used, the research steps include the unit root test, cointegration test, and estimation using the Vector Error Correction Model (VECM). Based on the results of the impulse response and variance decomposition analysis, it can be seen that the overall global index, exchange rates, and SBI interest rates contributed to the IHSG movement. Based on the analysis of variance decomposition, the percentage value of the contribution of the Hang Seng index is the biggest compared to the NASDAQ, Nikkei 225, and Kospi.

Keywords: IHSG, Stock Price Index, Vector Error Correction Model

JEL Classification Code: C22, E40, F30

1. Introduction

Investment in the capital market is influenced by several factors, both economic and non-economic. Aspects that affect investment activities in the capital market are macroeconomic conditions in which these conditions are reflected as monetary economic indicators. These include GDP, inflation, interest rates, the rupiah exchange rate against the US dollar, foreign exchange reserves, the balance of payments, and conditions of regional exchanges. In Indonesia, capital market trading is carried out on the Indonesia Stock Exchange. The Indonesia Stock Exchange can spur economic growth because cheap funds can be obtained from the capital market, even though

its performance has ups and downs. Investors can take advantage of the capital market as a means of investing to gain profits in the form of increased capital (capital gains) and dividends to invest in the stock market, and interest for investing in the bond market. If the returns expected from an investment are high, the risk is also high. To make the right investment decision or to get returns as expected, investors need to make assess in advance the stocks they would want to choose. The stock valuation that produces intrinsic value information will then be compared with the stock market price to determine the buying or selling position of a company's stock (Tandelilin, 2010).

The fall in financial and monetary markets as a result of the financial crisis in the United States had a negative impact on other countries, such as Indonesia where the rupiah depreciated against the dollar and resulted in a decline in the price of trading shares on Indonesia Stock Exchange (IDX) incorporated in IHSG. IHSG is the yardstick that is used to measure the combined performance of all shares listed on the IDX. The more developed the national capital market, the more will the IHSG increase. Susilo, Wahyudi, and Pangestuti (2020) examine the influence of the world and regional capital market conditions on the Indonesian

¹First Author. Associate Professor, Gunadarma University, Indonesia.

²Corresponding Author. Associate Professor, Gunadarma University, Indonesia [Postal Address: Bukit Cengkeh Berbunga Blok A2/17 Jalan Anggrek 1 Depok 16418, West Java, Indonesia]
Email: henmedya@staff.gunadarma.ac.id; medyawati70@gmail.com

© Copyright: The Author(s)

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

capital market (IDX) condition. It was found that there was a significant positive effect of DJIA with lag 1 and Hang Seng index on the IHSG, but no significant effect was found from the Nikkei 225 index on the IHSG. Investment in the capital market is influenced by several factors, both economic and non-economic factors.

Apart from monetary economic indicators, other things that need to be considered, namely, regional exchanges, especially the United States, which has the largest capital market industry in the world, so that it is used as an indicator of other stock market developments (Sunariyah, 2011). Samsul (2006) states that index movements in a country's capital market are influenced by world capital market indexes. This is due to trade flows between countries, freedom of information flow, and deregulation of capital market regulations, which make it easier for investors to enter a country's capital market. Garefalakis, Dimitras, Koemtzopoulos, and Spinthropoulos (2011) explore the effects of equity, energy, gold, and currency indicators on the Hang Seng index. The results suggest that the major stock markets, and particularly the SP500, positively influence the Hong Kong stock market, a fact that is attributed to the integration and internationalization of stock markets. This study, also, provides evidence that crude oil, as a proxy for economic activity and playing a substantial role in the modern portfolio formation, also affects, positively the Hong Kong stock market. Furthermore, the results show that the volatility of the gold returns influence, the mean return of the Hang Seng index negatively. Finally, the research findings show that the volatility of Hang Seng index returns has revealed an asymmetric phenomenon, as it appears to be more volatile in response to negative shocks caused by lower Hang Seng index prices.

The dollar exchange rate is one of the factors that mostly influence the ups and downs of the IHSG. If the dollar exchange rate is high, investors will prefer to invest in US dollars compared to investments in securities because investing in securities is a long-term investment. Likewise, if the value of the US dollar exchange rate decreases, investors will prefer investing in securities so that it will affect the value of stock transactions, which in turn will affect the IHSG (Hermawan & Triono, 2010). Lee and Brahmasrene (2019) found that the results of vector error correction estimates show that long-term causality from exchange rates to the Korean stock market is observed. For short-term causality, the coefficient of the Japanese yen exchange rate is significant with a positive sign, that is, short-term causality from the Japanese yen exchange rate to the Korean stock market is observed. The coefficient of the financial crises, i.e., 1997–1999 Asian financial crisis and 2007–2008 global financial crisis on the endogenous variables in the model and the Korean economy is significant. The result indicates that the financial crises have considerably affected

the Korean economy, especially a negative effect on the money supply.

Apart from exchange rates, there are other factors, namely, the global stock market index, which is used to measure the economic performance of a country. The global stock exchange index used in this study is the first, stock exchange index in America, namely the Nasdaq. The NASDAQ Stock Market is the second-largest stock exchange in the world after the NYSE. NASDAQ was founded in 1939 in Washington. Exchange members on the NASDAQ are called market-makers, the number of which reaches 415 securities companies (Samsul, 2006). Second is the stock exchange index in Hong Kong, namely, the Hang Seng. The Hang Seng Index has the average combined price of 33 blue-chip companies in Hong Kong, one of which is HSBC. Third is the stock exchange index in Japan, namely, the Nikkei 225. Japan is a country that plays a role in encouraging Indonesia's economic development, which can be viewed from three aspects including the trade, investment, and economic cooperation sectors. Fourth is the stock exchange index in South Korea, namely, KOSPI. Indonesia is one of the countries that have an important position in South Korea, in several fields, such as economy, industry, manufacturing, and cultural exchange. Besides, South Korea has experienced an economic growth in recent years, partly due to the sale of electronic products, which are in great demand by Indonesians.

The purpose of this study is to analyze the impact of the shock from the global index (Nasdaq, Hang Seng, Nikkei 225, KOSPI), SBI, and exchange rates on the IHSG on the IDX for the 2008–2019 period. Also, this study analyzes the percentage contribution of each variable in the research model toward the movement of IHSG, which is relatively uncommon in previous studies. The contribution of this research is to continue on the previous research conducted by Medyawati and Yunanto (2015) with the additional data from 12 years and the addition of variables, namely, interest rates. This is to obtain a more in-depth and thorough analysis. In this study, the interest rate used is that from SBI (Bank Indonesia Certificate). The estimation method used in this study is the Vector Error Correction Model (VECM) because it is considered the most suitable for the type of time-series data. Some studies that use the VAR model are generally related to the analysis of the impact, contribution, or influence of a variable on other variables with a long research time (more than 10 years), namely, Purwono and Mucha (2018) who conducted an impact analysis from exchange rate volatility with research data from 2005–2014. Nguyen (2020) analyzed the relationship between various factors such as FDI, foreign aid, exports, and economic growth in Vietnam. This research employed secondary time-series data from 1997–2018.

2. Literature Review

The following describes several studies that discuss the influence of macro variables on the IHSB movement. According to Dornbusch and Fischer (1980) state that changes in currency or exchange rates affect the competitiveness of a company, which in turn affects the company's revenue or cost of funds and subsequently its share price. On a macro level, the impact of currency exchange rate fluctuations on the capital market depends highly on the level of openness of the domestic economy and the sustainability of the trade balance. Roni (2013) analyzes the cointegration and causality relationship as well as the dynamic relationship between foreign capital flows and changes in exchange rates and the movement of the IHSB in the Indonesian capital market. The results of this study indicate that the IHSB is better able to explain its effect on capital inflow into Indonesia, while capital inflow can explain its effect on the movement of the rupiah exchange rate.

Yuliana and Syamsudin (2010) examined the effect of macroeconomic variables and the foreign stock price index on the composite stock price index. The results from their study show that inflation, money supply, and the Dow Jones Industrial Average have a positive effect on the IHSB, while the SBI and exchange rates have a negative effect on the IHSB. Research conducted by Sidiq (2010) on the effect of the STI (The Straits Times Index), TAIEX, KOSPI, HANG SENG stock index on the movement of the composite stock price index on the IDX shows that the Asia Pacific stock price index has an effect on the IHSB except for TAIEX, whereas simultaneously the Asia Pacific stock price index affects on the IHSB movement. Research has also been conducted by Hasibuan and Taufik (2011) on the effect of the global stock price index on the movement of the composite stock price index. The results showed that the global stock price index, namely Nasdaq, Kospi, Taiex, and Nikkei simultaneously affected the IHSB. The partial analysis shows that the Nasdaq and Kospi indexes have an effect, while Taiex and Nikkei have no significant effect on the IHSB. The relationship between currency exchange rates and stock prices has been studied for more than 30 years. Purnomo (2012) examines both short and long-term relationships between domestic and foreign source stocks and the Composite Stock Market Index (IHSB). This research finds that the Indonesian-dollar exchange rate has bidirectional influences on the IHSB.

In addition to domestic macroeconomic variables, this research reports evidence that the IHSB is cointegrated with the stock market indexes of several Southeast Asian stock markets. Haryogo (2013) examines the effect of the exchange rate and the Dow Jones index on the Composite Index on the Indonesia Stock Exchange. The results showed that partially, the exchange rate had no significant effect on the IHSB, while the Dow Jones had a significant effect

on the IHSB. Taking the exchange rate and the Dow Jones influence the IHSB. Sutanto, Werner, and Ernawati (2013) analyzed the effect of macroeconomics on the IHSB. The variables used in this research are SBI, World Oil Price, World Gold Price, Rupiah Exchange Rate against Dollar, Nikkei 225 Index, and Dow Jones Index. The results showed that the SBI and World Oil Price variables had no significant positive effect on the IHSB. World Gold Price Variables, Nikkei 225 Index, and Dow Jones Index have a significant positive effect on the IHSB. The variable the Rupiah exchange rate against the Dollar has a significant negative effect on the IHSB. Nezky (2013) shows that the US crisis affects the capital market in Indonesia where the Dow Jones Industrial Average plays a greater role in explaining the IHSB, compared to the Rupiah rate, production index, and the trade income tax. Besides, the US crisis affects the volume and the trade income tax in Indonesia. Asia Pacific stock prices affect the JCI. Gom (2013) found that the Fed variable influences negatively against the IHSB, while the Dow Jones Index and the Nikkei 225 Index influence positively against the IHSB.

Oktarina (2016) analyzes the effect of several global stock indexes and macroeconomic indicators on JCI. The global stock indexes and macroeconomic indicators used in this study are the Dow Jones Industrial Average Index, Nikkei 225 index, Shanghai Composite Index, FTSE100 index, oil prices, gold prices, exchange rate IDR/USD, BI rate, and inflation, that were taken monthly from 2009 until 2014. This research used multiple linear regression analysis. The results indicate that the Dow Jones Industrial Average index, Nikkei 225 index, gold prices, and inflation have a positive effect on IHSB, while the Shanghai Composite index, FTSE100 index, oil prices, exchange rate IDR/USD, and BI rate have a negative effect to IHSB. Murty, Anthony, and Vighnesvaran (2017) studied the relationship between Kuala Lumpur Composite Index Stock Market Return and four macroeconomic determinants, namely, interest rate, exchange rate, money supply, and oil price from January 1997 to December 2015 monthly with a total of 228 observations. Results indicated that there is a negative relationship between exchange rate and stock market return and a positive relationship between money supply and stock market return. Interest rate and oil price are found to have an insignificant relationship with the stock market return. Nidar and Diwangsa (2017) found that the Dow Jones index and the STI index have a significant positive effect on the movement of foreign investments in the Stock Exchange. In contrast, the movement of world oil prices and the exchange rate of the IDR/USD have a significant negative effect on the movement of foreign investments in the BEI. Kusumawati and Asandimitra (2017) analyze the influence of DIJA Index, FTSE100 Index, NIKKEI I225 Index, KOSPI Index, Hang Sheng Index, Gold Price, Money

Supply and net export to Indonesia Composite Index. The result of this study shows that DJIA, FTSE100, Hang Seng, money supply, and net export have not influenced Indonesia's Composite Index. Meanwhile, NIKKEI 225, KOSPI, and gold price have a positive relationship with Indonesia Composite Index.

Larasati and Topowijono (2017) analyze the influence of inflation rate, interest rate of SBI, and United States Dollar exchange rate simultaneously and partially on the Composite Stock Price Index (IHSG). The sample was based on monthly time-series data from January 2010 to December 2011. Results indicated that inflation rate, SBI rate, and US Dollar exchange rate have significant influence on the IHSG simultaneously. They further indicate that inflation rate, SBI rate and US Dollar exchange rate each had a negative effect and are significant to IHSG. The most dominant influential variable in this research is US Dollar exchange rate. Oktavia, and Handayani (2018) analyze the effect of the rupiah exchange rate on GDP growth, and the Dow Jones Index Average (DJIA) on the composite stock price index on the Indonesia stock exchange, over the period 2012–2015. Based on the result it is known that the rupiah exchange rate has no effect on the Composite Stock Price Index (IHSG). GDP growth and the Dow Jones index Average (DJIA) have affected the IHSG. Widodo (2018) found that N225, KS11 and KLSE variables have positive and significant influence on JKSE variable. Whereas HSI and STI variables have no effect on JKSE variable during January 2009 to May 2017. Setiawan and Mulyani (2020) analyzes the effect of Rupiah exchange rate, inflation rate, and international exchange index towards IHSG. The independent variables of this study are rupiah exchange rate, inflation rate, Dow Jones index, Nikkei 225 index, and Hang Seng index.

3. Research Method and Materials

The research variables are HSGI, rupiah exchange rate, and global stock price index, which includes the American stock price index (Nasdaq), Hong Kong stock price index (Hang Seng), Japanese stock price index (Nikkei 225), and South Korean stock price index (Kospi). The data used is monthly time-series data from 2008 to 2019. The reason for the start of the research year to be 2008 is because that year there was a global crisis and Indonesia was one of the countries affected by the crisis. The data used in this study are secondary data obtained from Bank Indonesia publications through www.bi.go.id, the Indonesia Stock Exchange, and Yahoo Finance (finance.yahoo.com). Following the type of data used, the research steps include the unit root test, cointegration test, and estimation using VECM. In a situation where all variables contain unit roots but are co-integrated, the Vector Error Correction Model (VECM) model can be used (Rosadi, 2012, p. 216).

4. Results and Discussion

This study uses seven variables, namely, IHSG, exchange rates, SBI, and global stock indexes represented by NASDAQ, Hangseng, Nikkei, and Kospi. The IHSG has been fluctuating for 12 years. This indicates that the stock market in Indonesia is very active and can provide a special attraction for domestic and foreign investors. In August 2008 IHSG experienced a decline due to the global crisis. The decline was sharp enough to touch the level of 1241.54 points in 2008. But after the global crisis, the IHSG again showed positive things seen from 2009 to 2015 IHSG tended to continue to increase. In 2015 IHSG in the first semester could reach the level of 5518.51 points. However, after the first semester of 2015 till early 2016, the IHSG experienced a slight decline, i.e., in the range of 4223.78 to 5422.38 points. 2015 was a hectic year, marked with high volatility due to uncertainty about the timing of the US interest rate hike (which was finally decided by the Federal Reserve in December 2015) and the economic slowdown of the People's Republic of China (PRC). 2017 seems to have been quite an exciting year for the Indonesian stock market. The Jakarta Composite Index (IHSG) has experienced a strengthening trend from the beginning of the year to the end of the year. HSG continued its strengthening trend during June and July 2017. At its peak, the IHSG again recorded its highest record, at 5,900 on 3 July 2017. The strengthening of the IHSG was welcomed by many parties, including President Joko Widodo. Jokowi stated that the increase in the JCI to a record high was proof of the high level of investor confidence in the Indonesian economy (Setiawan, 2017).

The rupiah exchange rate is the exchange rate of rupiah against the United States dollar. The exchange rate used is the rupiah middle exchange rate against the United States dollar issued by Bank Indonesia. The rupiah exchange rate fluctuated slightly in the 2008–2019 period. In November 2008, the rupiah exchange rate was the highest, while in February 2013 the rupiah was at the lowest. For the first time since April 2009, in September 2013, the US-rupiah middle exchange rate rose to Rp11,000. This is due to, among other things, unstable political conditions in certain countries. At that time, market participants were worried that, if it happened, the United States' attack on Syria would make crude oil prices go even higher. If this happens, we can be sure that the holes for the deficit in the trade balance, current account, and Indonesia's budget will be even wider (Jatmiko, 2013). The rupiah exchange rate closed this year's trading position by occupying the lowest depreciation position in the Asian region, correcting 10.15% to a level of Rp13,788 per US dollar year-to-date. The strengthening of the dollar was due to lower oil prices and many other commodities (Sukirno, 2015). This condition was much different from the conditions in 2018, even though the rupiah

at that time had almost reached IDR15 thousand/US dollar. Inflation is currently under control at the level of 3.2%. The reference interest rate, although experiencing an increase, is still at 5.5% and the domestic economy is still growing at around 5%. Besides, Bank Indonesia’s foreign exchange reserves amounted to US\$117.93 billion, or about five times higher than during the crisis, which was only around US\$18 billion. The rupiah exchange rate in 2019 was recorded to strengthen at the level of Rp14,146 against the US dollar, an appreciation of 3.9%. According to the Minister of Finance, the rupiah exchange rate tends to strengthen in 2019 and there is an increase in the supply of money in circulation, so the rupiah exchange rate will improve or strengthen in 2019. The exchange rate appreciation reached 3.9% at the end of this period because it was driven by an increase in foreign currency supply (Anggraeni, 2020).

During the study period, the SBI interest rate fluctuated quite sharply. The SBI interest rate with a tenor of 1 month had reached 70%/year during the monetary crisis in 1998. The prices of goods surged and the occurrence of riots in almost all regions of Indonesia triggered inflation of more than 70%, causing interest rates to soar. The domestic economy experienced a contraction (negative growth) of more than 13%, causing the rupiah exchange rate to depreciate to above Rp15,000/United States dollar. In October 2008, the SBI interest rate tended to decline. However, it rose quite sharply to 9.50%, but only lasted 3 months and then fell back to 8.25% at the beginning of 2009. In the following 4 months, interest rates remained at 7.5, i.e., until June 2009. The next years, 2010, 2011 rates were stable at 6.5%. For 3 years, namely, till the end of 2013, 2014, 2015 successively, the interest rate increased to 7.5%.

The next discussion is about the NASDAQ Index. The NASDAQ index was chosen to represent the American stock exchange because NASDAQ is the first electronic stock exchange in the world. NASDAQ (an abbreviation for National Association of Securities Dealers Automated

Quotations) started on February 8, 1971. NASDAQ is a stock exchange that accommodates small, medium, and large-scale companies. The NASDAQ index during the study period tended to increase. This can be seen in Figure 1.

Toward the end of 2016, the Wall Street stock market ended in the negative zone by the close of trading, in late 2016. IT-based stocks weighed heavily on the Wall Street stock market in the United States. Analysts pointed out that trading volume declined due to factors leading up to the holiday and many investors shifted funds from the capital market to bonds after a long stock market rally following the sentiment of the presidential election in the USA. Analysts also criticized the behavior of investors when the stock market plunged in January 2016 on a sentiment related to China’s slowing economic growth. However, the majority of the stock indexes recovered and rallied, ending higher this year. The weakening US stock market went up the country’s stock market strengthening this year along with most of the markets that have been maintained since Republicans won the US election. This has sparked hopes for a higher growth policy from the newly elected president’s government. The Hang Seng Index represents the Hong Kong’s stock market fluctuated quite sharply (see Figure 1). The Hang Seng Index (HSI) is a cumulative index of 38 blue-chip stocks from the Hong Kong Stock Market, which is one of the most trusted stock indexes, which used by investors and fund managers to invest. In 2017, despite geopolitical turmoil such as the heat of the Korean Peninsula and the Iran-Saudi Arabia conflict, Asian stock exchanges showed an extraordinary performance, when the Hang Seng Index led the market’s rise. Throughout 2017 until the close of trading in December 2017, the Hang Seng index recorded an increase of 35.99% per year to date (Rahmawati, 2017).

The growth of the Nikkei index showed a relatively stable movement between 2009 and 2012 as seen in Figure 2. From 2012 to 2014 the Nikkei index continued to increase.

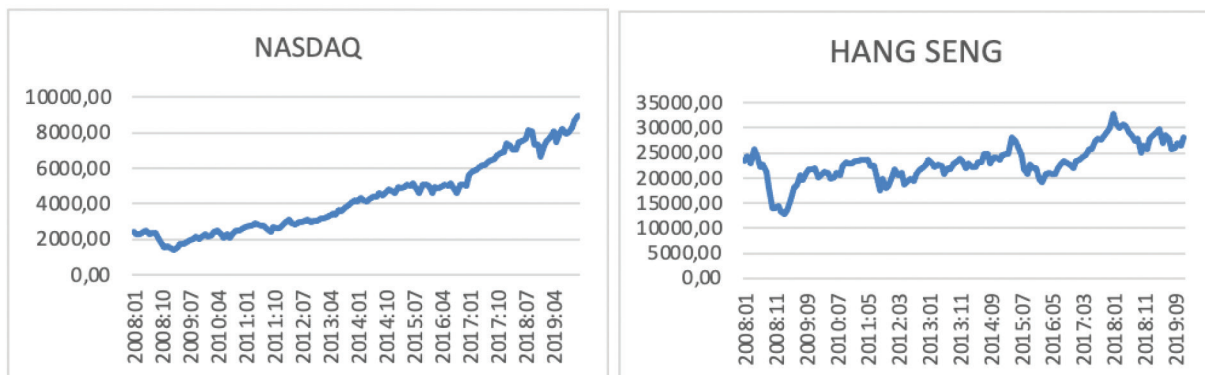


Figure 1: The Growth of NASDAQ and HANG SENG Index in Period 2008–2019

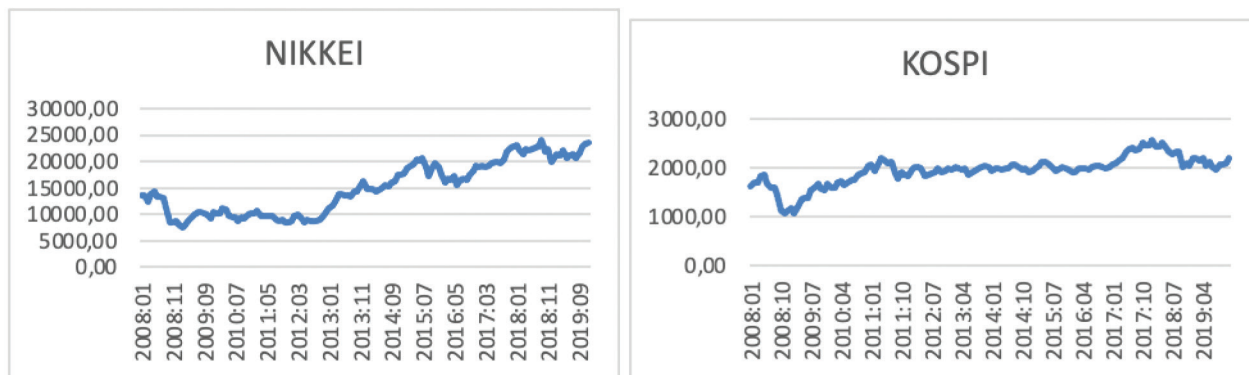


Figure 2: The Growth of Nikkei 225 and KOSPI Index in the Period 2008–2019

This shows that investor confidence continued to grow and the condition of the capital market has been trading actively. The Nikkei 225 Stock Average has risen in the last two days setting a record break in 15 years. The jump in the index occurred after the Central Bank of Japan (BoJ) promised to increase its monetary stimulus. The Nikkei 222 index rose 0.8% to 19,789.81 in the close of trading in Tokyo, the highest since April 2000. Strengthening stocks led by energy companies were triggered by rising crude oil prices to reach their highest levels this year. Dentsu Inc shares rose by 6.1% after the company announced increased sales. Kawasaki Heavy Industries Ltd shares rose 2.5% after it was reported that the company would experience an increase in fiscal revenue of up to 16% (Santosa, 2015).

The KOSPI Index has been down since October 2008, from the previous 1448.06 in September to 1113.06 in October. In 2009 March, it climbed back to position 1206.26. There are growing signs that the world’s 13th largest economy, the Republic of Korea, is among the most vulnerable during the global financial crisis. A senior Bank of Korea (BOK) official declared on December 2 that the annualized growth for the fourth quarter would be less than 3%. The IMF, however, has already slashed its 2009 forecast for South Korea to just 2% and the fear is that it may enter negative growth next year for the first time since the 1997–98 Asian financial crisis. On December 1, Samsung Securities predicted that the economy would shrink by 0.2 percent in 2009, following in the steps of the US, Japan and Europe (Chan, 2008). The KOSPI index was corrected in mid-May 2015 after the Bank of Korea decided to maintain its benchmark interest rate. The KOSPI fell 0.65% to 2,106.50 levels, having gained 0.58% to 2,132.53 levels at the opening. The index today is fluctuating in the range of 2,104.77–2,134.36. The Central Bank of South Korea used data on the spike in household debt throughout April 2015 as an excuse to delay monetary easing policy

Table 1: Unit Root Test

Variable	Level I(0)	First Difference I(1)
IHSG	-0.637225	-10.17935
KURS	-0.796974	-11.05200
NASDAQ	1.183578	-13.11989
HANG SENG	-1.879549	-11.90616
NIKKEI	-0.195314	-11.55864
KOSPI	-1.842022	-10.57432
SBI	-2.241568	-4.819805

(Gosta, 2015). The movement of the KOSPI index weakened in trading in December 2017. The index is lower by 0.42% or 10.49 points at the level of 2,461.00. After the previous trading, the index had closed up 0.30% or 7.49 points at the level of 2,471, 49 (Nugroho, 2017).

The VAR model is a regression equation model that uses time-series data. The first step in forming the VAR model is to test the stationarity of the data. The result of the unit root test shows that all variables in this study have a unit root as listed in Table 1.

In a situation where all variables contain unit roots, but are co-integrated, the Vector Error Correction Model (VECM) model can be used (Rosadi, 2012, p. 216). The VECM model is used in the non-structural VAR model that is the time-series data is not stationary at the level, but is stationary in differentiation and cointegration data so that it shows a theoretical relationship between variables. With this cointegration, the VECM model, which is a non-structural VAR model, is called the restricted VAR model (Widarjono, 2007). The next stage for data processing is to test whether there is cointegration in the research variables. The cointegration test used is the Johansen test, where Johansen statistics can be used to see the amount

of cointegration between variables (Rosadi, 2012, p. 217). This test can only be done when the data, namely all variables in the research model, are integrated to the same degree (Widarjono, 2007). That is if the combination of two series, which is not stationary, moves in the same direction towards its long-run equilibrium and the differentiation between the two series is constant. The results of the Johansen cointegration test showed that the trace test indicates 1 cointegrating equation at 5%. The test results through the Eviews output show that there are indications of cointegration in the two variables. Based on the results of the unit root test and cointegration test, in this study, the analysis used the VECM model. In the VAR method, determining the optimal lag rate is important. This is because the independent variable used is none other than the lag of the endogenous variable. In the first stage, the maximum indolence length in a stable VAR system is observed by performing repeated estimates starting from the lowest lag, which is one, and so on. When the VAR model is estimated with a lag rate of 14, the resulting modulus range is equal to or greater than one. Based on these results, the maximum lag is 13, which can be produced by a stable VAR system. The modulus range values obtained at slowness 13 are 0.245103 to 0.999408.

The next step is to determine the candidates for inaction to determine the optimal lag. In this study, the criteria selected were based on the AIC statistical value. Eviews software, which is used as a data processing tool, provides recommendations for optimal lags with an asterisk (*) as shown in Table 2.

According to the data used in this study, namely, monthly data, the optimal slowness is 13 months. These results indicate that the exchange rate, SBI, and global indexes measured through the Nasdaq, Kospi, Nikkei, Hang Seng indexes affect the IHSG within 13 months. The next stage is to analyze through impulse response and variance decomposition. Individually the coefficients in the VAR model are difficult to interpret, so econometrics use impulse response analysis (Widarjono, 2007). Impulse response analysis tracks the response of endogenous variables in the VAR system due to shocks or changes in the disturbance variable (*e*). In addition to the impulse response, the VAR model also provides a forecast error analysis of the decomposition of variance or often known as variance decomposition. Variance decomposition is useful for predicting the percentage contribution to the variance of each variable due to changes in certain variables in the VAR system. The following is the result of the impulse response (see Figure 3).

Based on Figure 3, it can be seen that the shock from the Hang Seng, Nikkei, and the exchange rate has an impact on ISHG. The shock from the Hang Seng, Nikkei, and exchange rates made the IHSG rise until the second period. The positive impact was relatively brief, namely, only up to the second period, then showed a decline and even received a negative response, i.e., shock by the exchange rate and Nikkei. In terms of the Hang Seng index, after experiencing increases in the second period, the third and fourth sharply fell, the 5th period went up again but then fell back in period 6. The shock from the Hang Seng caused the IHSG

Table 2: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-5374.409	NA	2.13e+27*	82.79091	82.94532*	82.85365*
1	-5330.765	8191663	2.32e+27	82.87331	84.10856	83.37523
2	-5277.900	93.52984	2.19e+27	82.81385	85.12994	83.75496
3	-5252.361	42.43420	3.20e+27	83.17479	86.57172	84.55507
4	-5210.765	64.63487	3.70e+27	83.28869	87.76645	85.10815
5	-5176.245	49.92051	4.86e+27	83.51146	89.07007	85.77011
6	-5131.767	59.53275	5.62e+27	83.58103	90.22047	86.27885
7	-5090.723	50.51519	7.10e+27	83.70343	91.42372	86.84044
8	-5045.261	51.05735	8.75e+27	83.75786	92.55899	87.33405
9	-4982.888	63.33255	8.78e+27	83.55212	93.43409	87.56750
10	-4927.604	50.18066	1.05e+28	83.45545	94.41826	87.91001
11	-4866.689	48.73235	1.27e+28	83.27214	95.31578	88.16587
12	-4766.382	69.44297	9.41e+27	82.48281	95.60729	87.81572
13	-4679.783	50.62739	1.01e+28	81.90435*	96.10968	87.67645

to fluctuate between periods, but did not cause the IHSG to fall below zero points. The Hang Seng Exchange is one of the best performing exchanges, has led to the rise in Asian markets. As explained in the descriptive analysis, throughout 2017 until the close of trading in December 2017, the Hang Seng Index recorded an increase of 35.99% per year to date. Shocks from the Nasdaq, Kospi, and SBI caused the IHSG to fall below zero in the second period. These fluctuations were triggered by political conditions in the United States, as well as the weakening condition of the Kospi index in recent years.

Next, is the analysis of variance decomposition to obtain an overview of the contribution by each variable. Based on the analysis of variance decomposition, the results show that the percentage contribution of the Hang Seng index to the tenth period is relatively the largest compared to other indexes in this study. The amount of the Hang Seng index's contribution is in the range of up to 10,026% to 12.54%. This result is not in line with previous research conducted by Lestari (2014) where Hang Seng index did no effect on the IHSG. The interest rate contributed the least, which was only in the range of 0.0018% (in period 2 or month 2) to 3.04% (on period 12).

In the initial period, in month 1, all variables have not contributed to the IHSG movement (see Table 3). However, from the 2nd to the 13th period, every variable contributed to the IHSG movement, especially up to the 4th period, which showed an increase (except for the Hang Seng Index). At the end of the period, namely, the 13th

month, all research variables showed a slight decrease in the percentage compared to the 12th month. The Hang Seng Index fell by approximately 0.49%, Kospi fell 0.204%, the exchange rate fell 0.28% and the SBI fell by 0.12%. However, NASDAQ Index rose 0.4%, the Nikkei was up 0.894%. Indonesia is a small open economy where these countries are not the countries that determine world inflation and world economic growth. Indonesia is heavily influenced by other major countries such as the United States and the People's Republic of China. According to Daruri (2019), Indonesia is one of the countries that have an orientation to attract investment from the People's Republic of China (PRC).

5. Conclusion

Based on the results of the impulse response and variance decomposition analysis, it can be seen that the overall global index, exchange rates, and SBI interest rates contributed to the IHSG movement. Shocks from the Hang Seng Index, Nikkei 225, and exchange rates made the IHSG rise or in other words, the IHSG gave a positive response to shocks to the Hang Seng index, Nikkei 225, and exchange rates. On the other hand, shocks from Kospi, NASDAQ, and SBI were responded negatively by IHSG. Based on the analysis of variance decomposition, the percentage value of the contribution of the Hang Seng index is the biggest compared to the Nasdaq, Nikkei 225, and Kospi.

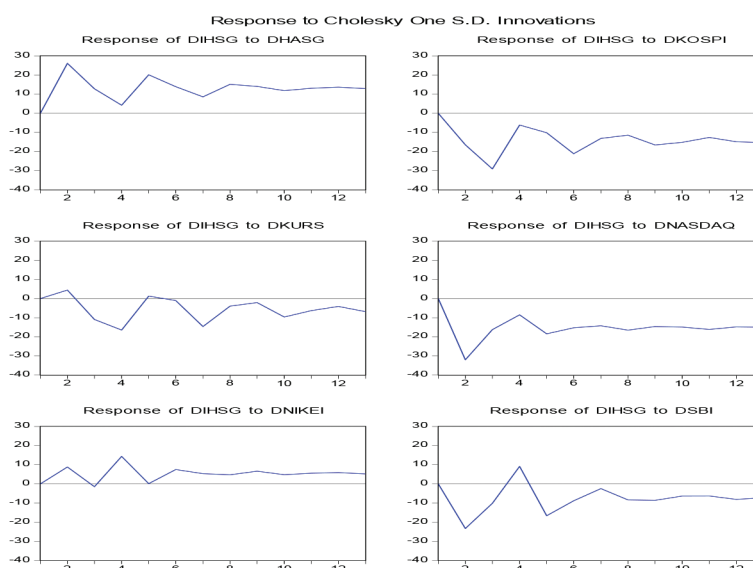


Figure 3: Impulse Response of IHSG

Table 3: Variance Decomposition of IHSG

Period	S.E.	DIHSG	DHSG	DNASDAQ	DKOSPI	DNIKEI	DKURS	DSBI
1	175.6315	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	191.9437	84.89486	0.698643	1.470533	1.821861	0.237247	10.87505	0.001806
3	211.0302	75.13691	11.16623	1.415244	1.966040	0.199143	8.999563	1.116871
4	226.2721	65.84572	10.02627	6.652963	2.039295	1.166141	13.01064	1.258973
5	234.8502	63.27976	12.03241	6.442626	2.336211	1.534593	12.25563	2.118771
6	239.1179	61.99087	11.70991	6.326671	4.314887	1.629554	11.95269	2.075420
7	250.2857	56.58222	10.71837	5.977869	6.370969	6.507439	10.93842	2.904707
8	257.9528	54.45926	12.44501	6.170019	6.418561	7.041573	10.51616	2.949417
9	266.4094	53.56583	12.54079	7.034957	6.017539	7.067957	10.97849	2.794437
10	267.6872	53.62901	12.43002	7.124196	5.971443	7.042251	11.03106	2.772022
11	273.9424	52.52449	12.20277	7.072635	5.715559	9.140438	10.56008	2.784032
12	276.7416	52.32265	12.00111	6.942111	6.288378	9.035050	10.36848	3.042217
13	282.5901	52.08286	11.50986	7.384068	6.085360	9.929223	10.08826	2.920368

References

- Anggraeni, R. (2020). The rupiah exchange rate has strengthened throughout 2019, this is the reason. *Sindonews*. Retrieved from <https://ekbis.sindonews.com/berita/1489777/33/kurs-rupiah-menguat-sepanjang-2019-ini-penyebabnya>
- Daruri, A. D. 2019. Banking supervision for small open economy. *Investor*. Retrieved 16 July, 2020, from <https://investor.id/opinion/pengawasan-perbankan-untuk-small-open-economy>
- Dornbusch, R., & Fischer S. (1980). Exchange rates and current account. *American Economic Review*, 70(5), 960–971.
- Garefalakis, A. E., Dimitras, A., Koemtzopoulos, D., & Spithiropoulos, K. (2011). Determinant factors of Hong Kong stock market. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.1762162>
- Gom, H. G. (2013). Analysis of the influence of the Fed rate, the Dow Jones index and the Nikkei 225 Index on the Composite Stock Price Index (IHSG) on the Indonesia Stock Exchange (BEI) for the 2008–2013 period. *Journal of Economics and Finance*, 1(8), 26–38.
- Gosta, D. R. (2015). South Korean Exchange: BoK interest rate remains KOSPI corrected. *Bisnis*. Retrieved 18 July, 2020, from <https://market.bisnis.com/read/20150515/7/433541/bursa-korsel-15-mei-suku-bunga-bok-bertahan-kospi-terkoreksi>
- Haryogo, A. (2013). The effect of the exchange rate and the Dow Jones index on the composite index on the Indonesia Stock Exchange. *Finesta*, 1(1), 1–6.
- Jatmiko, B. P. (2013). First since 2009, the BI dollar exchange rate has reached Rp. 11,000. *Kompas*. Retrieved 17 July, 2020, from <https://money.kompas.com/read/2013/09/04/1507102/Pertama.Sejak.2009.Kurs.Dollar.BI.Tembus.Rp.11.000>
- Kusumawati, D. A., & Asandimitra, N. (2017). Impact of global index, gold price and macro economic ariable for Indonesia Composite Index. *Research Journal of Finance and Accounting*, 8(2), 53–62.
- Larasati, C. A., & Topowijono. (2017). Effect of the inflation rate, Bank Indonesia Certificate interest rate, and the United States dollar exchange rate on the Composite Stock Price Index: Studies on the Indonesian Stock Exchange 2010–2015. *Business Administration Journal*, 49(2), 147–156.
- Lee, J. W., & Brahmasrene, T. (2019). Long-run and Short-run Causality from Exchange Rates to the Korea Composite Stock Price Index. *Journal of Asian Finance, Economics and Business*, 6(2), 257–267. <https://doi.org/10.13106/jafeb.2019.vol6.no2.257>
- Lestari, D. P. (2014). *Effect of exchange rates and the global stock index on the composite stock price index (IHSG) on the IDX in the 2008–2013 period* (Undergraduate thesis). Faculty of Economics, Gunadarma University, Indonesia.
- Murty, U., Anthony P., & Vighnesvaran, R. (2017). Factors affecting Kuala Lumpur Composite Index (KLCI) stock market return in Malaysia. *International Journal of Business and Management*, 12(1), 122–132.
- Nidar, S. R., & Diwangsa, E. J. (2017). The influence of global stock index and the economic indicators of stock investment decision by foreign investors in the Indonesian Stock Exchange. *Journal of Finance and Banking Review*, 2(1), 32–37.
- Nezky, M. (2013). The influence of the US economic crisis on the Indonesian Stock Exchange and trade. *Economics and Monetary Newsletter*, 15(3), 89–103.
- Nguyen, C. H. (2020). The Impact of Foreign Direct Investment, Aid and Exports on Economic Growth in Vietnam. *Journal*

- of *Asian Finance, Economics and Business*, 7(10), 581–589. <https://doi.org/10.13106/jafeb.2020.vol7.no10.581>
- Nugroho, A. C. (2017). Kopsi and Won Compact closed lower. Retrieved July 15, 2020, from <https://market.bisnis.com/read/20171212/7/717557/kopsi-won-kompak-ditutup-melemah>
- Oktarina, D. (2016). The influence of several global stock indices and macroeconomic indicators on the movement of the JCI. *Journal of Business and Banking*, 5(2), 163–182.
- Oktavia, S., & Handayani, W. (2018). Effect of Rupiah Exchange Rate, GDP Growth, and Dow Jones Index on Composite Stock Price Index in Indonesia Stock Exchange. *Journal of Accounting and Strategic Finance*, 1(1), 23–32.
- Purwono, R., Mucha, K., & Mubin, M. K. (2018). The dynamics of Indonesia's current account deficit: Analysis of the impact of exchange rate volatility. *Journal of Asian Finance, Economics and Business*, 5(2), 25–33. <https://doi.org/10.13106/jafeb.2018.vol5.no2.25>
- Rahmawati, W. T. (2017). Hang Seng won the 2017 Asian regional stock index. *Kontan*. Retrieved July 15, 2020, from <https://investasi.kontan.co.id/news/hang-seng-jawara-indeks-saham-kawasan-asia-2017>
- Roni, M. (2013). *Analysis of the Cointegration Relationship and Causality and the Dynamic Relationship between Foreign Capital Flows, Changes in Exchange Rates and Movement of the JCI in the Indonesian Capital Market 2007–2012*. (Master's thesis). Master of Accounting, Mercu Buana University.
- Rosadi, D. (2012). *Applied econometrics and time series analysis with EViews, applications for economics, business and finance*. Yogyakarta: Andi Offset.
- Samsul, M. (2006). *Capital market and portfolio management*. Jakarta: Erlangga.
- Sidiq, A. (2010). The effect of the STI, TAIEX, KOSPI, HANGSENG stock index on the movement of the composite stock price index on the IDX. *Management and Accounting Research*, 1(2), 1–18.
- Santosa, U. A. (2015). Nikkei 225 record highest record in 15 years. *Kontan*. Retrieved July 15, 2020, from <https://investasi.kontan.co.id/news/nikkei-225-cetak-rekor-tertinggi-dalam-15-tahun>
- Setiawan, S. R. D. (2017). In 2017, IHSG managed to break the highest record. *Kompas*. Retrieved 16 July, 2020, from: <https://ekonomi.kompas.com/read/2017/12/26/063253926/catatan-2017-ihsg-berhasil-tembus-rekor-tertinggi-sepanjang-masa?page=all>
- Setiawan, K., & Mulyani, E. (2020). Effect of changes in the rupiah exchange rate, inflation rate, and international stock index on the Composite Stock Price Index (IHSG) on the Indonesia Stock Exchange (IDX). *EcoGen: Majoring in Economic Education, Faculty of Economics, Padang State University*, 3(1), 7–18.
- Susilo, D., Wahyudi, S., & Pangestuti, I. R. D. (2020). Factors affecting the Indonesia Stock Exchange: A Multi-Index approach. *International Journal of Financial Research*, 11(2), 196–204.
- Sukirno. (2015). *The rupiah exchange rate dropped the most in Asia, during 2015 it was corrected 10.15% to Rp. 13,788/USD* Retrieved from <https://market.bisnis.com/read/20151230/93/505886/kurs-rupiah-paling-jeblok-di-asia-sepanjang-2015-terkoreksi-1015-ke-rp13.788us>
- Sunariyah. (2011). *Introduction to capital market*. Yogyakarta: UPP STIM YKPN.
- Sutanto, B., Werner, R. M., & Ernawati, E. (2013). Analysis of the effect of macroeconomics, the Dow Jones index and the Nikkei 225 index on the Composite Stock Price Index (IHSG) on the IDX for the 2007-2011 period. *Calytra: Student Scientific Journal Surabaya University*, 2(1), 1–9.
- Tandelilin, E. (2010). *Portfolio and investment, theory and application* (1st ed). Yogyakarta: KANISIUS.
- Widodo. (2018). Analysis of the effect of the Asian regional composite stock price index on the Indonesian composite stock price index. *Ekbis: Journal of Economics and Business*, 1(2), 148–164.