The Effect of Dow Jones Industrial Average, Nikkei 225 Index and Shanghai Composite Index on IDX Composite Index
(Testing Hypotheses in Conditions of the Covid-19 Virus Pandemic)

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Abstract

The purpose of this study is to determine the effect of the Dow Jones Industrial Average, the Nikkei 225 index and the Shanghai Composite Index on IDX Composite Index. The population and samples used in this study are the Dow Jones Industrial Average, the Nikkei 225 Index, the Shanghai Composite Index, and the IDX Composite Index for the period January 2 to April 30, 2020. The type of data is secondary data. The analysis method used are classical assumption test which consists of normality test, multicollinearity test and autocorrelation test and multiple regression analysis. Hypothesis test using F-test and t-test. The results of the study found that the Dow Jones Industrial Average and the Nikkie 225 index partially affected the IDX Composite Index positively and significantly. The Shanghai Composite Index has no significant effect on IDX Composite Index.

Keywords: Dow Jones Industrial Average, Nikkei 225 Index, Shanghai Composite Index, IDX Composite Index

1. Introduction

The spread of the corona virus or Covid-19 around the world makes many people worried and anxious. This epidemic is spreading every day and continues to grow. This Covid-19 has already begun to strike in Europe, the United States and Southeast Asia and has begun to wreak havoc in Africa and South America.

Covid-19 first appeared in China in early 2020 and has spread to almost every country in the world. The World Health Organization (WHO) has officially declared COVID-19 a pandemic. A pandemic is a term for an infectious disease that spreads over a wider area, even almost all over the world.

The Covid 19 virus not only has an impact on human health globally but also has an indirect impact on the economy and stock exchanges globally. Quoted from Indonesia.GO.ID (Indonesian Information Portal), on March 24, 2020, "The condition of the global stock market is also inseparable from the onslaught of the Covid-19 outbreak. Meanwhile, Jakarta stock market players generally adhere to the generic formula that price movements on the IDX cannot be separated from global market conditions, especially the United States (US) and the Asian region".

Indications of the impact of Covid-19 on the stock exchange can be seen from the release of large numbers of shares and the result is that the stock price is sold at a lower price than its fundamental value, this causes the index on the stock exchange to fall very sharply. The following is the development of stock indices during the Covid-19 pandemic from developed countries used as research samples as illustrated in table 1, table 2 and table 3 below.

Table 1. **Dow Jones Industrial Average (DJIA) January - April 2020**

	End of Month 2020			
	January	**February**	**March**	**April**
DJIA	28,256.03	25,409.36	21,917.16	24,345.72
Change		(10.07%)	(22.43%)	11.08%

Source: Investing.com

From table 1 above, it can be seen that the Dow Jones Industrial Average (one of the stock market indexes in the United States) in February and March 2020 decreased significantly compared to January 2020, and in April 2020 it increased not so significantly compared to March 2020. The decline in the Dow

Jones Industrial Average in (DJIA) in these months is in line with the outbreak during the corona virus pandemic.

Table 2. Nikkei 225 January - April 2020

	End of Month 2020			
	January	February	March	April
Nikkei 225	23,205.18	21,142.96	18,917.01	20,193.69
Change		(8.89%)	(18.48%)	6.75%

Source: Investing.com

Table 2 above shows that the Nikkei 225 index (Tokyo Stock Exchange index) in February and March 2020 decreased significantly compared to January 2020, and in April 2020 it increased not so significantly compared to March 2020. The decline in the Nikkei 225 index in those months in line with the outbreak during the corona virus pandemic.

Table 3.
Shanghai Composite Index Januari - April 2020

	End of Month 2020			
	January	February	March	April
Shanghai	2.976,53	3.380,30	2.750,30	2.860,08
Change		13.57%	(7.60%)	3,99%

Source: Investing.com

From table 3 above, it is shown that the Shanghai Composite Index (the largest stock exchange index in the People's Republic of China) in February 2020 there was an increase compared to January 2020, and in March 2020 it decreased compared to January and February 2020, in April 2020 it increased not so significantly compared to March 2020 The decline in the Shanghai index in March 2020 was in line with the outbreak during the coronavirus pandemic.

The Covid 19 virus also has an impact on the capital market in Indonesia, this is illustrated by the Composite Index on the Indonesia Stock Exchange (IDX) which showed a decline in the last few weeks of March 2020. The development of the IDX composite index during the corona virus pandemic is presented in table 4 below:

Table 4.
IDX Composite Index January - April 2020

	End of Month 2020			
	January	February	March	April
IDX	6,057.59	5,452.70	4,538.93	4,642.47
Change		(9.99%)	(25.07%)	2.28%

Source: Investing.com

Table 4 above shows that the IDX Composite Index in February and March 2020 decreased quite significantly compared to January 2020, and in April 2020 it increased not so significantly compared to March 2020. The decline in the IDX Composite Index in these months was in line with the spread of the virus.

Negative sentiment caused the decline in the three stock indexes from developed countries as illustrated in tables 1, 2 and 3 in the conditions of the spread of Covid-19, which was followed by a decrease in the IDX composite Index, which was related. Theoretically, Samsul (2008) reveals that the movement of the index in a country's capital market is influenced by world capital market indices. This is due to the flow of trade between countries, the freedom of information flow, and the deregulation of capital market regulations that make it easier for investors to enter a country's capital market. Tryfino (2009) states that the movement of world stock exchanges is sometimes quite significant in influencing the movement of the IDX composite index and stock prices in Indonesia.

Empirically there are researchers who have conducted research related to the global index with the IDX Composite Index, namely Tita & Stella (2009); Shelby (2014), Farikhah & Nurhadi (2019); Oktarina (2015); Wayan and Luh (2015) who found the Dow Jones index had a significant positive effect on the IDX Compsite Index. Tita & Stella (2009); Shelby (2014) found that the Nikkei index had a significant negative effect on the IDX Composite Index. Tita & Stella (2009) found the Shanghai Composite had a significant positive effect on the IDX Composite Index. Shelby (2014); Farikhah & Nurhadi (2019) found the Shanghai Composite Index had a significant negative effect on the IDX Composite Index. Riskin (2016); Sihombing & Rizal (2014) found that the Shanghai Composite Index had a negative but not significant effect on the IDX Composite Index. Riskin (2016); Oktarina (2015); Mansur (2009); Astuti (2013); Susanto (2013), Kartika et al (2013) showed the findings that the Nikkei 225 index had a positive and significant effect on the IDX Composite Index. Wayan and Gede (2015); Sihombing and Rizal (2014) found that the Nikkei 225 index had no significant effect on the IDX Composite Index.

Tandelilin (2010) stated that information on stock market performance is often summarized in an index called the stock market index. The stock market index is an indicator that reflects the performance of stocks in the market. Jogiyanto (2017) stated that the Indonesia Stock Exchange has several indexes, namely the composite stock price index (CSPI), the liquid 45 index (ILQ-45), sectoral IDX (Indonesia Stock Exchange) indexes, the Jakarta Islamic Index (JII) index, Main Board index and Development Board index, Kompas 100 index, BISNIS-27 index, PEFINDO25 index, SRI-KEHATI index, Indonesia Sharia Stock Index (ISSI), and IDX30 Index, Infobank 15, SMitra 18, MNC36, Investors 33.

The Composite Stock Price Index is a stock price index number that has been compiled and

calculated by generating a trend, where the index number is a number that is processed in such a way that it can be used to compare events that can be changes in stock prices from time to time (Jogiyanto: 2013). The IDX Composite Index is considered the basis of analysis that is most often used by analysts to see stock conditions in the Indonesian capital market (Fahmi, 2014). According to Sunariyah (2013), the composite stock price index describes a series of historical information regarding the movement of the combined stock price of all stocks up to a certain date.

The Dow Jones index is one of the main indexes in the United States which includes the 30 largest multinational companies in America, therefore this index is able to describe the performance of the American economy Antonio et al (2013). The Dow Jones 30 index is one of the oldest stock indexes in the world and is often used as a reference for the ups and downs of world stock trading, and was originally pioneered by two Wall Street Journal editors and founders of the leading company Dow Jones & Company, Charles Dow and Edward Jones, the index this is commonly known as the Dow Jones Industrial Average (DJIA), and is sometimes known as the US-30 (Martin, 2014).

The Nikkei 225, commonly known as the Nikkei, Nikkei index, or Nikkei Stock Average, is a stock market index for the Tokyo Stock Exchange (TSE). Since 1950 the Nikkei 225 has been counted daily by the Nihon Keizai Shimbun (Nikkei) newspaper. This index is a price-weighted average (in yen units), and its components are reviewed annually. Today the Nikkei is the most quoted Japanese equity average index, as is the Dow Jones Industrial Average in the United States. The Nikkei 225 was known as the "Dow Jones Nikkei Stock Average" between 1975-1985.

Samsul (2008) revealed that the world capital market indices affect the movement of the index in a country's capital market. This is due to the flow of trade between countries, the freedom of information flow, and the deregulation of capital market regulations that make it easier for investors to enter a country's capital market. Blanchard (2006) states that one of the factors that can affect the movement of a country's stock index is the global stock index. Sunariyah (2013) stated that the increase in the Dow Jones Index indicates that the United States economy is improving. As one of Indonesia's export destinations, which reached 13.99 billion US dollars in 2015, the United States' economic growth can encourage Indonesia's economic growth through export activities and capital inflows, both direct investment and through the capital market.

Fahmi (2014) stated that the reason why it is necessary to understand the United States of America is that at this time the country can be regarded as a reference for the world economy, almost all American companies are involved in investing in various countries, and vice versa, many companies from various countries in the world involved in investing in America. Therefore, Tryfino (2009) stated that the movement of the Dow Jones Industrial Average Index sometimes significantly affects the movement of the index and stock prices in Indonesia.

Previous studies such as Tita and Stella (2009), Shelby (2014), Farikhah and Nurhadi (2019), Oktarina (2015), I Wayan and Luh Gede (2015) found that the Dow Jones index had a positive effect on the JCI. On the basis of the theory and the results of previous research, the first hypothesis in this study is as follows:

H₁: The Dow Jones Industrial Average has a positive and significant effect on IDX Composite Index

Samsul (2008), revealed that world capital market indices affect the movement of the index in a country's capital market. This is due to the flow of trade between countries, the freedom of information flow, and the deregulation of capital market regulations that make it easier for investors to enter a country's capital market. Blanchard (2006) states that one of the factors that can affect the movement of a country's stock index is the global stock index.

The Nikkei 225 Index lists large companies operating globally, including in Indonesia. If the Nikkei 225 index increases, it will give a picture of the improving performance of the Japanese economy. Japan is one of Indonesia's export destinations, Japan's growing economy can encourage Indonesia's economic growth through export activities and capital inflows, both in the form of direct investment and through the capital market, so that this will affect the movement of the JCI (Sunariyah, 2013).

H₂: Nikkei 225 index has a positive and effect on IDX Composite Index

Samsul (2008), revealed that the world capital market indices affect the movement of the index in a country's capital market. This is due to the flow of trade between countries, the freedom of information flow, and the deregulation of capital market regulations that make it easier for investors to enter a country's capital market. Blanchard (2006) states that one of the factors that can affect the movement of a country's stock index is the global stock index.

Andrew Walker (2015) Economic correspondent for the BBC World Service, said: "China is now such a big power in the global economy that it will inevitably affect the whole world. China is the world's second largest economy and the second largest importer of goods and services" (www.bbc.com). Andrew Walker (2015) further argues "The decline in

stocks in China triggered sharp falls in stock markets in Asia, Europe, and the United States."

Previous research such as Tita and Stella (2009) found the Shanghai Composite Index had a positive effect on the IDX Composite Index. On the basis of the theory and the results of previous research, the third hypothesis in this study is as follows:

H₃: The Shanghai Composite Index has a positive effect on the IDX Composite Index

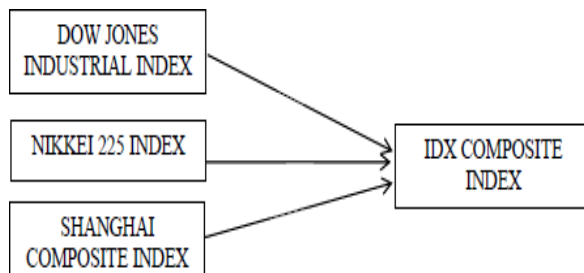Based on the theory, the conceptual framework is as follows:

Figure 1. Research Framework

2. Method

The population and samples used in this study are the Dow Jones Industrial Average, the Nikkei 225 Index, the Shanghai Composite Index, and the IDX Composite Index for the period January 2 to April 30, 2020 (76 days). The type of data used in this study is secondary data in the form of daily data on the IDX Composite Index, Dow Jones Industrial Average, Nikkei 225 Index and Shanghai Index from January 2, 2020 to April 30, 2020. The data source is obtained from the Indonesia Stock Exchange for IDX data, and Investing.com for data on the Dow Jones Industrial Average, Nikkei 225 Index and Shanghai Index.

The analytical method used is multiple regression model with the following formula:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Information:
α: Constant
β_1: Coefficient of direct effect of X_1 on Y
β_2: Coefficient of direct effect of X_2 on Y
β_3: Coefficient of direct effect of X_3 on Y
Y: IDX Composite Index
X_1: Dow Jones Industrial Average
X_2: Nikkei Index 225
X_3: Shanghai Composite Index
ε: Other variables outside the research

3. Result and Discussion

Result

Before performing multiple regression analysis, a prerequisite test is carried out, namely the classical assumption test, the results of the normality test are in table 5 below:

Table 5. Normality Test Result

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
Monte Carlo Sig. (2-tailed)	Sig.	.154d

Data processed by authors

From the table Kolmogorov-Smirnov Test can be seen the calculation results show that the Monte Carlo Sig. (2-tailed) = 0.154 is greater than the significance level (α) used in the test, which is 5%, it can be concluded that the estimation equation data is normally distributed.

The results of the multicollinearity test are in table 6 below:

Table 6. Multicollinearity Test Result

Collinearity Statistics	
Tolerance	VIF
.547	1.828
.533	1.875
.965	1.036

Data processed by authors

The results of the Multicollinearity test in Table 7 Coefficients show that the tolerance value of the independent variables DJIA (Dow Jones Industrial Average) and the Nikkei Index is less than 10% or 0.1, the VIF value of the independent variables DJIA (Dow Jones Industrial Average) and the Nikkei Index is more than 10, so it can be concluded that there are no symptoms of multicollinearity in the research data.

The results of the autocorrelation test presented in Table 7 Model Summary show that of all research variables, the DW (Durbin-Watson) value is 0.393. With the number of samples 84 and the number of independent variables 3 and = 5%, the numbers dl = 1.5723 and du = 1.7199 are obtained. Because DW is 0.393 below dl, it can be concluded that in this regression model there is an autocorrelation.

Table 7. Autocorrelation Test Result

Durbin-Watson
1.707

Data processed by authors

Based on the classical assumption test, it can be concluded that the multiple regression data for research contains symptoms and autocorrelation, so healing must be done with the Cochrane Orcutt Transformation Method.

The following is presented the results of processing SPSS 22 for multiple regression that has been cured.

Table 8. Coefficient Determination Test Result

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.771[a]	.594	.578	0.2261

Data processed by authors

Table 9. F-test Result

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.059	3	.020	38.503	.000[b]
	Residual	.040	79	.001		
	Total	.099	82			

Data processed by authors

Table 10. t-test Result

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.114	.174		-.656	.514
	Lag_X1	.243	.082	.287	2.957	.004
	Lag_X2	.606	.113	.524	5.339	.000
	Lag_X3	.082	.060	.101	1.381	.171

Data processed by author

Based on table 10, the multiple regression equation can be formulated as follows:

$$Y = -0.114 + 0.243X_1 + 0.606X_2 + 0.082X_3$$

From table 9 (ANOVA) it can be seen that the calculation results obtained an F value of 38.503 which is more than t-table (α, nk-1: 5%, 80;3) = 2.72 and α significance value of 0.0000 which is less than 0.05, it can be concluded that the multiple regression model for the study meets the Goodness of Fit and is feasible to use as a model.

From table 8 the coefficient determination test, it can be seen that the coefficient of determination is 0.578 or 57.8% which shows that 57.8% of the variation in the Composite Stock Price Index (Y) can be explained by variations in the independent variables Dow Jones Industrial Average (X1), Nikkei Index (X2). and the Shanghai Index (X3), while the remaining 42.2% is explained by other variables outside the model.

Based on testing the regression coefficients of the partial regression method using the t-test, it can be proven that the Dow Jones Industrial Average (X1) has a significant positive effect on the IDX Composite Index (Y) with a probability value of 0.004 which is less than = 0.05 or t-statistic = 2.957 more than t-table (α, n-k: 5%, 84-4) = 1.664. The Nikkei Index (X2) has a significant positive effect on IDX Composite Index (Y) with a probability value of 0.000 less than = 0.05 or t-statistic = 5.339 more than t-table (α, n-k: 5%, 84-4) = 1.664. The Shanghai Index (X3) has a positive and insignificant effect on the IDX Composite Index (Y) with a probability value of 0.171 which is more than = 0.05 or t-count = 1.381 smaller than t-table (α, n-k: 5%, 84-4) = 1.664.

Discussion

The first hypothesis in this study is that the Dow Jones Industrial Average has a positive effect on the IDX Composite Index. Based on the results of statistical tests, it is found that the Dow Jones Industrial Average (DJIA) has a positive and significant effect on IDX Composite Index, so the first hypothesis can be accepted. The results of this study are in line with research conducted by Tita & Stella (2009), Shelby (2014), Farikhah & Nurhadi (2019), Oktarina (2015), Wayan & Luh (2015) which found the Dow Jones index had a positive effect on the IDX Composite Index.

The DJIA has a significant positive effect on IDX Composite Index, which is in accordance with the data in tables 1 and 4, where in table 1 it can be seen that there was a fairly high decline in the DJIA in February and March 2020 compared to January 2020, which was followed by a fairly high decline in IDX Composite Index (table 4) in February. and March 2020 compared to January 2020. In April 2020 the DJIA increased not so significantly followed by an increase on IDX Composite Index.

The results of this study prove that the DJIA has a positive effect on IDX Composite Index, meaning that if the DJIA decreases, it will cause IDX Composite Index to decline. The results of this study indicate that there is a relationship between the DJIA and IDX Composite Index. This relationship is in accordance with the theory revealed by Samsul (2008), that the movement of the index in a country's capital market is influenced by world capital market indices. This is due to the flow of trade between countries, the freedom of information flow, and the deregulation of capital market regulations that make it easier for investors to enter a country's capital market.

The second hypothesis in this study is that the Nikkei Index has a positive effect on IDX Composite Index. Based on the results of statistical tests, it was found that the Nikkei Index had a positive and significant effect on the IDX Composite Index, so the second hypothesis was accepted. The results of this study are in line with research conducted by Riskin (2016), Oktarina (2015), Mansur (2009), Astuti (2013), Susanto (2013), and Kartika et al (2013) showing the findings that the Nikkei 225 index has a significant positive effect on the IDX Composite Index.

The Nikkei Index has a significant positive effect on IDX Composite Index, which is in agreement with the data in tables 2 and 4, where in table 2 it can be seen that there was a fairly high decline in the Nikkei Index in February and March 2020 compared to January 2020, which was followed by a fairly high

decline on IDX Composite Index (table 4). February and March 2020 compared to January 2020. In April 2020 the Nikkei Index increased not so significantly followed by an increase in the JCI.

The results of this study prove that the Nikkei index has a positive effect on IDX Composite Index, meaning that if the Nikkei Index declines, the IDX Composite Index will decline. The results of this study indicate that there is a relationship between the Nikkei Index and the IDX Composite Index. This relationship is in accordance with the theory revealed by Samsul (2008), that the movement of the index in a country's capital market is influenced by world capital market indices. This is due to the flow of trade between countries, the freedom of information flow, and the deregulation of capital market regulations that make it easier for investors to enter a country's capital market.

The relationship between the Nikkei Index and the JCI was revealed by Sunariyah (2013) who stated that the Nikkei 225 Index listed large companies operating globally, including in Indonesia. If the Nikkei 225 index increases, it will give a picture of the improving performance of the Japanese economy. Japan is one of Indonesia's export destinations, Japan's growing economy can encourage Indonesia's economic growth through export activities and capital inflows, both in the form of direct investment and through the capital market, so that this will affect the IDX Composite Index.

The third hypothesis in this study is that the Shanghai Index has a positive effect on IDX Composite Index. Based on the results of statistical tests, it was found that the Shanghai Index had a significant positive effect on the IDX Composite Index, so the third hypothesis was rejected. This study is in line with research conducted by Riskin Hidayat (2016) and Sihombing and Rizal (2014) that the Shanghai Index has an insignificant negative effect on the IDX Composite Index.

The results of this study do not prove that the Shanghai Index has an effect on IDX Composite Index, meaning that the ups and downs of the Shanghai Index do not have an impact on the IDX Composite Index. The results of this study indicate that there is no conformity with the theory. Theoretically, as revealed by Samsul (2008), the movement of the index in a country's capital market is influenced by world capital market indices. This is due to the flow of trade between countries, the freedom of information flow, and the deregulation of capital market regulations that make it easier for investors to enter a country's capital market.

The Shanghai index has no significant effect on IDX Composite Index, it can be seen from the data on the movement of the index that there is a discrepancy, as shown in tables 3 and 4, where in table 3 it can be seen that the Nikkei Index in February 2020 compared to January there was an increase of 13.57%,

but the JCI experienced an increase of 13.57%. a decrease of 9.99%. In addition, there is a significant difference in decline, where in March 2020 the Shanghai Index decreased by only 7.60% compared to February 2020, while the JCI fell by 25.07%.

4. Conclusion

The results of this study found that the Dow Jones Industrial Average had a positive and significant effect on IDX Composite Index. The Nikkei 225 index has a positive and significant effect on IDX Composite Index. The Shanghai Index has no significant effect on IDX Composite Index.

In order to further develop the results of this study, it is possible to consider other variables, namely apart from the Dow Jones Industrial Average, Nikkei 225 and the Shanghasi Index, which are thought to affect IDX Composite Index. There are still many capital market indices in the United States, Europe and Asia. The number of samples for further research can increase the sample by increasing the research period.

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