
| RESEARCH ARTICLE

Black Swan Event on JCI Value and Sectoral Index for February-April 2020: Effects of Covid-19 in Indonesian Stock Exchange

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| ABSTRACT

The purpose of this study is to determine the effect or impact of the Black Swan Event (Covid19) on the value of the IHSG and Sectoral Index on the IDX and how much the comparison of changes in the value of the IHSG and Sectoral Index before and after the existence of Covid19. This research is included in associative research. Data collection techniques used documentation study. The samples in this study were all IHSG values and all Sectoral Indices on the IDX. The analytical tool used in this research is Structural Equation Modeling (SEM) with the WarpPLS Approach and the Wilcoxon Signed Rank Test. Based on the analysis results using Structural Equation Modeling (SEM) with the WarpPLS approach, it can be said that the Black Swan Event had a negative and significant effect on the movement of the IHSG value and the value of the Sectoral Index on the Indonesia Stock Exchange. In addition, the test results using the Wilcoxon Signed Rank Test also show that there is a very significant difference between the IHSG value and the Sectoral Index value before and after the Black Swan Event or the Covid19 phenomenon in Indonesia.

| KEYWORDS

Black Swan Event, IHSG, Sectoral Index, Covid19

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1. Introduction

The capital market is quite sensitive to changes in the economic conditions of a country because, basically, the existence of the capital market encourages capital inflow in a country. Therefore, an optimistic attitude from investors is needed in order to get a more optimal capital inflow. At the beginning of 2020, the Composite Stock Price Index (JCI) movement showed a positive signal of 6,323.46. The value of the JCI is very volatile and shows symptoms of a significant decline until the end of May 2020.

The sectoral index is a sub-index of the JCI. All issuers listed on the Indonesia Stock Exchange (IDX) are classified into 10 sectors, namely: Agriculture Sector, Mining Sector, Basic and Chemical Industry Sector, Miscellaneous Industry Sector, Consumer Goods Industry Sector, Property Sector, Real Estate and Building Construction, Infrastructure Sector, Utilities and Transportation, Financial Sector, Trade Sector, Services and Investment, and Manufacturing Sector. The sectoral index value also experienced a significant decline. The highest decline occurred in March and increased slightly again in May. But the sectoral index value in May was not higher than the sectoral index value in January. The declines that occurred in March with January as the basis were as follows: Agriculture Sector -30.33%, Mining Sector -15.71%, Basic Industry and Chemicals Sector -34.6%, Miscellaneous Industry Sector 34.54%, Consumer Goods Industry Sector -16.47%, Property, Real Estate and Building Construction Sector 25.02%, Infrastructure, Utilities and Transportation Sector -22.89%, Finance Sector -24.82%, Trade, Services and Investment Sector - 16.67%, and Manufacturing Sector -25.13%.

This decline is not without reason. This is closely related to the Covid 19 virus, which began to enter Indonesia in February 2020. At first, the Covid-19 virus was only endemic in the city of Wuhan, the capital of Hubei province, China. Then, over a period of no less than a month, this virus spread to almost the entire mainland of the Bamboo Curtain Country. In fact, to a number of countries

around the world. Meanwhile, there have been six people in Indonesia who have tested positive for the Covid-19 virus (Kompas, 2020).

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At the close of stock trading, Wednesday (18/3/2020), for example. JCI closed down 138.78 points or 3.11 percent to 4,317.96. If calculated in the last month, the JCI has weakened 26.96 percent. It was so bad that the Indonesia Stock Exchange (IDX) suddenly stopped trading stocks temporarily (trading halt) on Friday, last weekend. A sudden move to protect the market. The temporary suspension refers to the JCI figure, which has shrunk by 5 percent. The last trading halt was carried out by the IDX in 2008 and 2015 (Liputan6, 2020).

Since the first cases of COVID-19 patients were discovered in Indonesia, the Indonesian capital market has been in shambles. The regulators have tried hard by issuing various policies, but they are still unable to withstand the collapse of the Composite Stock Price Index (JCI) (Detik Finance, 2020).

Some of the phenomena above show that the Covid 19 outbreak has not significantly affected the stock market movement in Indonesia. The stock market movement is shaped by stock exchange players, both issuers, stock exchange intermediaries, and investors. Covid 19 is a special event whose appearance cannot be predicted by anyone. In financial behaviour, this phenomenon is commonly referred to as a black swan event. Black Swan Theory is something that refers to rare, high-impact, unpredictable and out of the ordinary events. A black swan is a term that refers to an event with a very small probability (nearly predictable, at least with statistics) but which can have a systematic and large impact (Taleb, 2009).

The impact of the black swan can be categorized as very large; for example, a terrorist attack on September 11 is an example of an event that is classified as a black swan and has a very large impact on the United States (Taleb, 2009). An empirical study was also conducted on the Shanghai and Shen Zhen capital markets on 24 August 2015 (Lin & Tsai, 2019). Based on several phenomena that occur, it becomes the basis for this study to determine the extent of the influence of black swan events on the Indonesia Stock Exchange, especially on the value of the JCI and sectoral indexes. In addition, how significant are the changes that have occurred due to Covid 19, which is considered a black swan event?

2. Literature Review

2.1 Capital market

The capital market is a meeting between parties who have excess funds and those who need funds by trading securities (Tandellin, 2017; Alisbha & Intishar, 2020). The benefits of the existence of capital markets can be explained as follows (Suteja & Gunardi, 2016); (1) Provide a source of (long-term) financing for the business world while at the same time enabling optimal allocation of funding sources; (2) Providing investment vehicles for investors while enabling diversification efforts; (3) The spread of company ownership to the middle class of society; (4) Provide the opportunity to have a healthy company and have prospects; (5) Openness and professionalism, creating a healthy business climate, creating interesting job/profession opportunities.

2.2 Share

Stock includes several things (1) Evidence of equity/fund ownership in a company; (2) Paper with clearly stated nominal value company name and followed by rights and obligations explained to each holder; (3) Inventories that are ready for sale (Fahmi, 2017).

In the capital market, there are two types that can be reviewed in several aspects, including (Kasmir, 2010): (a) In terms of the mode of transition; (1) Bearer stocks are shares that do not have a name or the name of the owner in the shares is not written; (2) Shares in the name (registered stocks), the name of the owner of the shares is written in the shares and to be transferred to another party certain conditions and procedures are required (b) In terms of collection rights; (1) Common stocks. For the owners of these shares, the right to receive dividends will take precedence over preferred shares; (2) Preferred stocks are shares that have the main right in dividends and assets when the company is liquidated.

2.3 Stock Market Index

The stock market index is an indicator that reflects the performance of stocks in the market. Because it is an indicator that describes the movement of stock prices, the stock market index is also called the stock price index (Stock Price Index). The composite stock price index (CSPI) or composite stock price index uses all listed stocks as a component of calculating the Index (Tandellin, 2017). An index is needed as an indicator to observe the price movements of securities (Jogiyanto, 2017).

The Composite Stock Price Index (JCI) is an index that measures the price performance of all stocks listed on the Main Board and Development Board of the Indonesia Stock Exchange (Bursa Efek Indonesia, 2020). The sectoral index is a sub-index of JCI. All issuers listed on the exchange are divided into several sectors, namely the Agricultural Sector Index, Mining Sector Index, Basic and Chemical Industrial Sector Index, Multi-Industry Sector Index, Consumer Goods Industry Sector Index, Property Sector Index, Real Estate, and Building Construction, Infrastructure Sector Index, Utilities and Transportation, Financial Sector Index, Trade Sector Index, Services and Investment, Manufacturing Sector Index (Bursa Efek Indonesia, 2020).

2.4 Behavioral Finance

Behavioral finance is a study of psychological factors that influence investors in investment decision making. After receiving information and facts, investors make decisions based on cognitive factors and emotional factors. The problem is that both factors are very easy to experience bias or deviation. Cognitive bias: Cognition is the process of understanding, processing, drawing conclusions on information or fact. Cognitive bias describes irregularities or errors in the process. Emotional bias: Emotions emphasize feelings and spontaneity more than facts. Emotional bias describes a decision error for ignoring facts (Manulife Asset Management, 2015).

Nofsinger (2001) defines behavioural finance (behavioural finance), which is studying how humans actually behave in a financial setting (a financial setting). Nofsinger also mentions that behavioral finance studies psychological factors that will influence financial decisions, companies, and financial markets. The explanation clearly explained that behavioral finance is an approach that explains how humans make investments that are influenced by psychological factors (Wiryaningtyas, 2016).

According to Riciardi (2000), behavioural finance is a science in which there is interaction from various disciplines (interdisciplinary) and continues to integrate so that the discussion cannot be isolated. Behavioral finance grew out of various assumptions and ideas from behavioral economics. Behavioral finance also involves emotions, traits, preferences and various kinds of things that exist in humans as intellectual and social beings who will interact underlie the emergence of decisions in taking action (Wiryaningtyas, 2016).

2.5 Black Swan

Black Swan is an event that could not be predicted in advance by (all but a very few of) the observers. In econometrics and statistics, an event such as a Black Swan would be considered to be an outlier, a value or number which deviates from the rest of the data "(Brunåker & Nordqvist, 2013).

Black Swans Anomalies is an unpredictable event because its place is out of common expectation, and it did not happen in the past, so it is impossible to show the result. *Black Swans Anomalies* greatly impact individual life and organizational evolution such as *history-making* "(Christianto & Murhadi, 2016).

The black swan in China was detected early 3 months before the event occurred. Some literature emphasizes the importance of considering human behavior, which is sometimes more often irrational in making decisions (Lin & Tsai, 2019). The black swan is an event that is very difficult to predict (in other words, the possibility of the event is very small) but can have a very significant impact. The impact of the black swan can be categorized as very large. What's interesting about this incident is that no matter how great mathematics and statistics are in making predictions, once this event occurs, the impact caused can result in a very large shift in prediction results (Kiky, 2020).

The frame of mind can be seen in the image below:

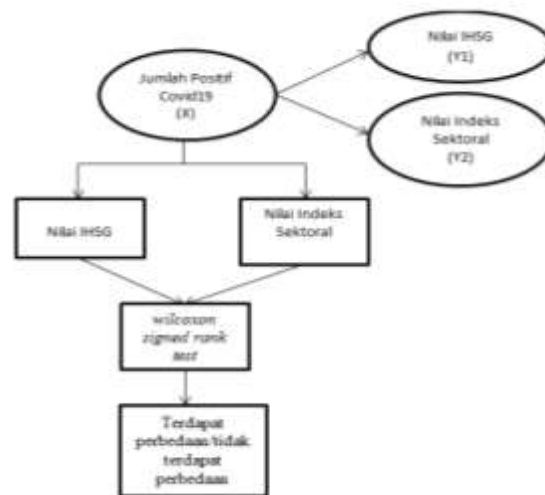


Figure 1. Framework of Thought

3. Research Methods

This research was conducted on the value of the JCI and all sectoral indices contained in the Indonesia Stock Exchange. The period used in this research is 3 months, starting from February-March 2020. This research is included in associative research. The data collection technique uses a documentation study where the documents used are monthly and weakly statistical stock index values

on the Indonesia Stock Exchange. The sample in this study is the entire value of the JCI and all sectoral indices on the Indonesia Stock Exchange by taking data for 3 months. The variables used in this study: The independent variables were the number of positive Covid19 (X) viruses; the dependent variable is the value of JCI (Y1); and the value of the Sectoral Index (Y2- Y11).

3.1 SEM with WarpPLS Approach

The data analysis method used is Structural Equation Modeling (SEM) with WarpPLS Approach. Before interpreting the results of hypothesis testing, the model should have a good Goodness of Fit. Goodness of Fit in question is an index and measure of the goodness of the relationship between latent variables (inner model) related to its assumptions (Solimun, 2017). *The Goodness of Fit Model on WarpPLS analysis can be seen in the following table.*

Table 1. Model Fit and Quality Indices

No	Model fit and quality indices	Fit criteria
1	Average path coefficient (APC)	$p < 0,05$
2	Average R-squared (ARS)	$p < 0,05$
3	Average adjusted R-squared (AARS)	$p < 0,05$
4	Tenanhaus GoF (GoF)	Small $\geq 0,1$, medium $\geq 0,25$, large $\geq 0,36$
5	Sympson's paradox ratio (SPR)	Acceptable if $\geq 0,7$, ideally = 1
6	R-squared contribution ratio (RSCR)	Acceptable if $\geq 0,9$, ideally = 1
7	Statistical suppression ratio (SSR)	Acceptable if $\geq 0,7$
8	Nonlinear bivariate causality direction ratio (NLBCDR)	Acceptable if $\geq 0,7$

Source: (Solimun, 2017)

If there are one or two indicators of Model Fit and Quality Indices, of course, the model can still be used.

3.2 Descriptive statistics

Descriptive statistics are statistics used to analyze by describing or describing the data that has been collected as it is without the intention of making generally accepted conclusions or generalizations (Sugiyono, 2017).

3.3 Wilcoxon Signed-Rank Test

The Wilcoxon Signed Rank Test is a non-parametric statistical hypothesis test used when comparing two related samples, the same sample or re-measurement on a single sample to assess whether there are differences in two measurements on the same sample. (Suryani & Hendryadi, 2015).

This different test is used to evaluate a particular treatment on the same sample at two different observation periods. The observations that will be carried out in this study are the conditions before and after the Covid19 in Indonesia.

The hypothesis test will be divided into 2, namely:

H0: There is no difference between JCI and Sectoral Index before and after Covid19 cases.

Ha: There is a difference between JCI and Sectoral Index before and after Covid19 cases.

4. Results and Discussions

4.1 Model Fit dan Quality Indices

Table 2. Fit and Quality Indices Model Results

No	Model Fit and Quality Indices	Fit Criteria	Results of Analysis	Information
1.	Average path coefficient (APC)	$p < 0.05$	$p = 0,001$	Good
2.	Average R-squared (ARS)	$p < 0.05$	$p = 0,001$	Good
3.	Average adjusted R-squared (AARS)	$p < 0.05$	$p = 0,001$	Good
6.	Tenanhaus GoF (GoF)	Small $\geq 0,1$, medium $\geq 0,25$, large $\geq 0,36$	0,870	Large (Ideal)
7.	Sympson's paradox ratio (SPR)	Acceptable if $\geq 0,7$, ideally = 1	1,000	Ideally
8.	R-squared contribution ratio (RSCR)	Acceptable if $\geq 0,9$, ideally = 1	1,000	Ideally
9.	Statistical suppression ratio (SSR)	Acceptable if $\geq 0,7$, ideally = 1	1,000	Ideally
10.	Nonlinear bivariate causality direction ratio (NLBCDR)	Acceptable if $\geq 0,7$, ideally = 1	1,000	Ideally

Source: Processed Data, 2020

Based on the Fit and *Quality Indices Model* results, it can be seen that the data used in the study has good and ideal *criteria*. This shows that the data used is worthy of further testing, namely hypothesis testing.

4.2 Output Total Effects

The results of hypothesis testing can be explained as follows:

Table 3. Output Total Effects

No	Relationships between Variables		Coefficient Line	P-Value	Information
1	X	Y1	-0,871	$<0,001$	<i>Highly Significant</i>
2	X	Y2	-0,891	$<0,001$	<i>Highly Significant</i>
3	X	Y3	-0,828	$<0,001$	<i>Highly Significant</i>
4	X	Y4	-0,882	$<0,001$	<i>Highly Significant</i>
5	X	Y5	-0,885	$<0,001$	<i>Highly Significant</i>
6	X	Y6	-0,844	$<0,001$	<i>Highly Significant</i>
7	X	Y7	-0,882	$<0,001$	<i>Highly Significant</i>
8	X	Y8	-0,852	$<0,001$	<i>Highly Significant</i>
9	X	Y9	-0,868	$<0,001$	<i>Highly Significant</i>
10	X	Y10	-0,890	$<0,001$	<i>Highly Significant</i>
11	X	Y11	-0,870	$<0,001$	<i>Highly Significant</i>

Source: Processed Data, 2020

Based on the results of the total effects contained in Table 5.2, it shows that variable X, namely the number of positive Covid-19 patients in Indonesia, has a very negative and very significant effect on the JCI value and the value of the Sectoral Index, which consists of Index values for the Agricultural Sector, Mining Sector, Basic Industry Sector and Chemicals. , Miscellaneous Industry Sector, Consumer Goods Industry Sector, Property Sector, Real Estate and Building Construction, Financial Sector, Trade, Services and Investment Sector, and Manufacturing Sector. The p-value for all variables shows a value of <0.001 , so it can be said that the level of significance that is owned is very high (Highly Significant). So if the number of positive Covid-19 patients in Indonesia increases, the JCI level and sectoral index on the Indonesia Stock Exchange will decrease and vice versa.

4.3 Descriptive Statistics

le 4. Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation	Variance
X	.00	337.00	86.9250	79.47049	6.316E3
Y1	3937.00	5999.00	5.3063E3	686.23078	4.709E5
Y2	819.00	1375.00	1.1385E3	182.89004	3.345E4
Y3	1047.00	1454.00	1.3060E3	133.53882	1.783E4
Y4	507.00	890.00	7.4263E2	134.29983	1.804E4
Y5	637.00	1137.00	9.6050E2	160.40653	2.573E4
Y6	1375.00	1994.00	1.7701E3	187.30597	3.508E4
Y7	307.00	458.00	4.0540E2	52.28512	2.734E3
Y8	688.00	1049.00	9.2955E2	117.90673	1.390E4
Y9	846.00	1349.00	1.1951E3	165.63101	2.743E4
Y10	549.00	719.00	6.5340E2	57.63537	3.322E3
Y11	873.00	1377.00	1.1915E3	163.59189	2.676E4
Valid N (listwise)					

Source: Processed Data, 2020

Based on the results of descriptive statistics, it can be seen that for the lowest number of positive Covid-19 patients with a value of 0 or zero cases, while the highest number is 337 positive Covid-19 cases in Indonesia. The lowest value of JCI is 3,937, and the highest value is 5,999. The lowest sectoral index value is owned by the Property, Real Estate, and Building Construction sector, which is 307, and the highest sectoral index value is in the Consumer Goods Industry sector, which is 1,994. The highest standard deviation is the JCI value of 686.23, which indicates that the JCI has the highest deviation value, while the lowest standard deviation is the Property, Real Estate and Building Construction sector of 52.28, which indicates that this sector has the lowest deviation value compared to other sectors on the Indonesia Stock Exchange.

4.4 Wilcoxon Signed-Rank Test

Table 5. Wilcoxon Signed-Rank Test Results

Variable	Significance
Y1 (JCI)	0,000
Y2 (Agricultural Sector)	0,000
Y3 (Mining Sector)	0,000
Y4 (Basic Industrial and Chemical Sector)	0,000
Y5 (Multi-Industry Sector)	0,000
Y6 (Consumer Goods Industry Sector)	0,000
Y7 (Property Sector, Real Estate and Building Construction)	0,000
Y8 (Infrastructure, Utilities and Transportation Sector)	0,000
Y9 (Financial Sector)	0,000
Y10 (Trade, Services and Investment Sector)	0,000
Y11 (Manufacturing Sector)	0,000

Source: Processed Data, 2020

Based on the results of the different tests using the Wilcoxon Signed Rank Test, which can be seen in Table 5.5, it can be seen that the results of all variables show the asymp sig value. (2-tailed) of 0.000, which means less than the probability level of 5% (0.05) so that H0 is rejected and Ha is accepted. So, in conclusion, there is a very significant difference between the JCI value and the sectoral index for all sectors on the Indonesia Stock Exchange between before the Covid19 and after the Covid19 in Indonesia.

5. Conclusion

Based on the test results, it can be said that the Black Swan Event has a negative and significant effect on the movement of the JCI and Sectoral Index values on the Indonesia Stock Exchange. In addition, there is also a very significant difference between the JCI value and the value of the Sectoral Index before and after the Black Swan Event. From the results of the study, it can be seen that the Black Swan Event has a significant influence on the value of the JCI and the Sectoral Index on the Indonesia Stock Exchange, so investors who invest in the Indonesia Stock Exchange must be careful and respond quickly in dealing with all conditions that may occur. In addition, sharp analysis is also needed by investors in dealing with this Black Swan Event.

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