

Melinda Malau (Comparative Analysis of Sell-In-May-And-Go- Away and Monthly Effect Before and During COVID-19 Pandemic at LQ45 IDX)

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Submission date: 06-Mar-2024 02:19PM (UTC+0700)

Submission ID: 2306678113

File name: ative_Analysis_of_Sell-In-May-And-Go-Away_and_Monthly_Effect.pdf (577.68K)

Word count: 6906

Character count: 34551



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Comparative Analysis of Sell-In-May-And-Go-Away and Monthly Effect Before and During COVID-19 Pandemic at LQ45 IDX

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Article Info

Article history:

Received September, 15th 2023

Revised October, 5th 2023

Accepted October, 25th 2023

Keywords:

LQ45, Covid-19, Monthly Return, Variance, Sell-In-May-And-Go-Away (SIMAGA)

ABSTRACT

In 2022, the number of investors in the Indonesian stock market experienced a four-fold growth compared to 2019. This surge occurred during the epidemic period. This financial research aims to analyze the impact of the COVID-19 pandemic on the monthly average return and risk pattern of LQ45, as well as the presence of the Sell-in-May-and-Go-Away (SIMAGA) effect and the optimal investment strategy for LQ45. The study uses a descriptive-comparative methodology and employs mathematical and statistical frameworks. The sample consists of LQ45 companies from 1997 to 2022. Data analysis techniques include the Normality Test, Wilcoxon Rank Test, F Test, and investment strategy simulation. The results indicate that COVID-19 did not have a negative effect on the monthly returns and risk patterns of LQ45, except in 2002. Additionally, the SIMAGA phenomenon is not present in LQ45, but the Sell in August-Buy in November (SIABIN) strategy has been identified as the most effective. These findings provide valuable insights for investors in allocating their investments and determining the best strategy for buying stocks. It is important to consider monthly return variance as a key metric for measuring investment risk and its impact on overall returns.



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INTRODUCTION

The COVID-19 pandemic that has affected almost every region in the world has impacted the economies of several countries, including Indonesia (Meita & Malau, 2023). Coronavirus, also known as COVID-19, is caused by the spread of the coronavirus. Coronavirus is a rare event that has a significant impact on the global economy. The Covid-19 pandemic has sparked a worldwide crisis. Not only a health crisis, but it has spread to a social to economic crisis, including the financial sector. The regulatory and supervisory authority of the financial sector, namely the Financial Services Authority (OJK), said that the COVID-19 pandemic had dealt a heavy blow. One of them is the Composite Stock Price Index (JCI). From the beginning of 2020 to 20 March 2020, aka only three months, the JCI landslide from the level of 6,300 to 3,900. Transaction volume also fell. If in 2019, the transaction volume was 36,534,971,048, in 2020 it fell to 27,495,947,445. This reflects mostly wait-and-see investor behaviour. Investors are worried about future market conditions (Karunia, 2020). Due to the large number of victims due to this pandemic, stock market prices have decreased in price. In addition, the COVID-19 pandemic in Indonesia also affected the capital market in Indonesia as well as changes in the trading time of the Indonesia Stock Exchange. This resulted in more investors selling their shares so that the stock market decreased and increased inefficiency in the stock market.

According to Tandelilin (2017) the capital market serves as a platform for parties with extra cash and parties in need of money to trade assets. The capital market may also be thought of as a venue for trading securities with a longer duration of maturity, such as mutual funds, stocks, and bonds. According to Fadly (2021), because it serves two purposes, the capital market is crucial to the economy of a nation. As a technique of getting cash from the investor community or as a source of corporate capital, first. The capital market may provide money for a variety of uses, including corporate growth and additional operating capital. Second, the capital market gives the general people the chance to invest in financial goods like stocks, bonds, mutual funds, and others. To a certain extent, supply and demand

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will cause the price of a stock to rise or fall. Investors often rely on circulating information and expert recommendations when deciding whether to buy or let go of a security.

Zarika & Paramita (2021) mention that investment in the capital market sector is becoming very popular. Among all the capital market products, stocks ⁵⁴ are one of the most popular and are in demand by investors. In Indonesia, this is evidenced by the **increase in the number of SIDs (Single Investor Identification)** in data released by the Indonesian Central Securities Depository (KSEI) in February 2022.

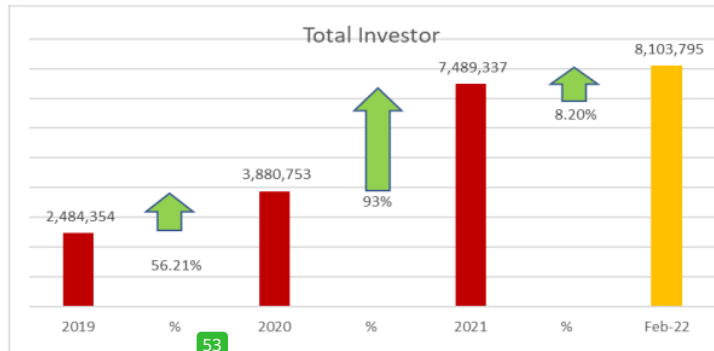


Figure 1 Development of the Number of Investors in the Indonesian Capital Market

Source: KSEI, February 2022

Based on Figure 1, it can be seen that in February 2022, the increase in the number of SID reached 8,103,795, an increase of 8.20% from December 2021. The implementation of stock investment has become very popular along with the development of technology and the internet, where investors can easily transact with media computers and mobile phones. According to (Wicaksana & Asandimitra, 2018), this is because stock investment offers a high level of profit, and the increase in stock prices can be very ³⁶ significant.

In an efficient market, stock price changes follow a random walk pattern, where stock price projections cannot be based on the historical price of the stock, but rather on all accessible information that appears in the market. In the world of capital markets, a number of irrational events called market anomalies often occur in relation to efficient markets. In these anomalies, something is found that should not happen if the market is truly efficient. (Hayati & Jamil, 2018) define anomaly as a situation where the stock return of a company does not match the expected value, namely when the average financial performance of all companies is good, the return should increase.

³ Two calendar anomalies that have been observed in financial markets are 1) ⁵ **cover effect**: the average rate of return determined for the month's last day and the next three days is higher than the average rate of return estimated for the month, which only considers the rate of return for one session. 2) the **Sell-in-May-and-Go-Away effect (also called Halloween)** means November through April has a larger return rate than May through October, according to empirical evidence. An anomaly is a condition where the company's stock return is not in accordance with what it should be. When the average financial performance of all companies is good, there should be an increase in returns. The anomalous state that starts in May and ends in October is called Sell-in-May-and-Go-Away (SIMAGA). **Investors prefer not to invest and sell their shares in May**, which is referred to as SIMAGA in the stock market. This cycle will mark the beginning of a negative trend, or a decline ⁵ in stock values, that will span from May to October. Beginning in November and peaking in January of the following year until ending in April, this cycle will turn around.

Based on Kochman & Bray (2017) research on the Standard & Poor's 500 index on www.bigcharts.com, The returns for the six-month period from January to February were shockingly flat, notwithstanding the Sell-in-May effect's ongoing effectiveness. Between 1995 and 2015, the returns for January-February were on average -0.04%, whereas the returns for **March-April** and **November-December** were 5.11% and 3.33%, respectively. However, annual returns for **November-April** are nearly six times greater than returns for **May-October**. Moreover, Borowski (2015) notes that calendar effects, in particular Sell-in-May-And-Go-Away, are a major concern in financial market

efficiency. According to the investment horizon and calculated rate of return, the study looked at the Sell-in-May-and-Go-Away strategy and its modifications on 122 equity indexes and 39 commodities using eight distinct methodologies. The results show that annualised returns in the November-April period are almost six times greater than those in the May-October period, providing important insights into portfolio management and financial behaviour. The calculations in this study show that the Sell-in-May-and-Go-Away effect was present in both the traditional time frame and alternative time frames for the market under review.

According to Hartono (2022), an event study is a study that examines the market reaction to an event whose details are published as an announcement. The Sell-in-May-and-Go-Away effect was classified as an anomaly in the capital market, so analysts and researchers began to connect the phenomenon to behavioural finance theory. Behavioural finance, according to Ricciardi & Simon in Hayati et al. (2022), aims to explain and increase understanding of the patterns of investor reasoning, including the emotive aspect and the degree to which these aspects influence decision-making. According to Zhao (2013), the Indonesia Stock Exchange is one of the emerging markets affected by the Sell-in-May-and-Go-Away effect. As evidenced by the low rate of return between May and October (+3.17) and between November and April (+17.48), the SIMAGA effect impacts the investor and trader's psychology in Indonesia.

A review of previous studies shows that the Sell-in-May-and-Go-Away effect does have a significant impact on market performance. It is therefore important to consider that market performance is the result of multiple factors and can be affected by the current economic, political, and financial situation. In this study, the researcher tries to reveal how the pandemic affected the return pattern and variance of the LQ45 index, which are important aspects of financial market analysis. Furthermore, this research provides valuable insights into the effectiveness of investment strategies such as SIMAGA, SIABIN, and BAH during the pandemic period. Then it can open a new window in connecting the SIMAGA phenomenon with behavioural finance theory, highlighting the role of emotional and psychological factors in investment decision-making. And this research provides a special understanding of how this phenomenon affects investors and traders in Indonesia.

RESEARCH METHODS

The research in this paper uses quantitative research that is based on a mathematical or statistical approach. The quantitative data collected will be analysed using computational techniques. The type of research used is comparative research that uses independent variables in different populations and samples, as well as different time periods. This research uses the event study method which aims to analyse the reaction to a particular event or announcement that is thought to have information content that will affect market reactions and is useful for assessing the efficiency of the semi-strong form of market (Hartono, 2022). The population selected in this study are the shares of companies listed on the IDX LQ45. The research sample used is the shares of all companies listed in LQ45 during the period 1997 to 2022, with a purposive sampling method approach. The selected sample consists of shares of companies listed in LQ45 during the period 1997-2022. The sample selection criteria are: Companies that have been listed on the Indonesia Stock Exchange for at least 3 months, Companies that are included in the top 60 companies with the highest market capitalisation and highest transaction value in the last 12 months, and companies that publish complete financial reports (audited) for the period 1997-2022.

This study uses LQ45 index record data for the period 1997-2022. Research procedures can collect data from both primary data sources and secondary data sources. This research uses secondary data in the form of the LQ45 index for the period 1997 to 2022. The data is taken from Yahoo Finance. This study uses graphical representation, F test, T test/Wilcoxon Sum Rank test to determine the difference. SPSS was used to execute the model in the study. The results of this data analysis explain whether at least one of the coefficients is not equal to zero and show the procedure for assessing each coefficient.

The theoretical framework

The market return is an indicator that encompasses the stock price movement and the preference stock movement within the market. Based on the Efficient Market Hypothesis (EMH), there should not be differences between months. It is because if there are differences in patterns between months,

investors could just invest in the regularized pattern. On the contrary, there could also be a Sell-in-May-and-Go-Away (SIMAGA) pattern. Based on the research of (Sembel et al., 2022), they stated that the spread of COVID-19 had resulted in an economic slowdown. (Saraswati, 2020) states that the COVID-19 pandemic caused a decline in stock prices in all industrial sectors. (Halisa & Annisa, 2020) state that the number of COVID-19 cases in Indonesia, the rupiah exchange rate, the Shanghai composite index, or SSE (SSEC), and the New York composite index or NYSE (NYA), both simultaneously and partially have an influence on the Indonesian Composite Stock Price Index (IHSG). (Nurcahyono et al., 2021) assert that COVID-19 had a detrimental effect on the performance of the Indonesian stock market. Stock returns are negatively impacted by the rise of positive cases and fatalities. These researchers' findings support the notion that the COVID-19 pandemic has a detrimental impact on the stock index, so for research question 1 (average monthly return), the theoretical hypothesis is as follows:

H1: There is a negative effect of COVID-19 on the average monthly return pattern of LQ45

According to (Wicaksana & Asandimitra, 2018), the stock market on the Indonesian stock exchange does not offer anomalous returns that vary across time periods. (Hayati et al., 2020) note in their study's findings that although the average return increased from November to April due to January's high returns, there was no selling in May, and the increase disappeared on stock exchange in Indonesia. In these circumstances, risk and return have an opposing relationship, showing that the Indonesia Stock Exchange corresponds to the efficient market theory. According to (Andrade et al., 2013), the average stock return was approximately 10 percent higher for the November-April half-year period than for the May-October half-year period, and the Sell-in-May effect was pervasive in the financial markets. Based on the research results of these experts, for research question 2 (variance return), the theoretical hypotheses are as follows:

H2: There is a negative effect of COVID-19 on the LQ45 monthly return variance pattern

In the words of Zhao (2013), there is evidence of a Sell-in-May effect in developed markets, developing countries, and frontier markets based on research findings. The May Effect was most pronounced in emerging markets, where returns were 11.07 percent higher from November to April than from May to October. As stated by Borowski (2015), the research results indicate that there is a Sell-In-May-And-Go-Away effect on the market when analysed in both traditional and non-traditional time frames. According to the research of Hap & Sumarsono (2020), the Sell-In-May-And-Go-Away phenomenon has a significant impact on negative returns in the agricultural stock market and other sectors. Meanwhile, the influence of the SIMAGA phenomenon on risk was determined to be negligible. Based on the research results of these experts, for research question 3, the theoretical hypotheses are as follows:

H3: The LQ45 Return for The May-October Period is lower than January-April plus November-December

Jacobsen & Zhang (2014) stated that from the results of the study, they found significant negative excess returns during the summer (-1.2% based on 33,348 monthly returns). Over the full year, we find a positive estimate for the equity premium of 3.7% annually (t-value 7.65). In the findings of Kochman & Bray (2017), Despite the Sell-In-May effect's ongoing performance, profits from the January-February sector for the six-month period remained unchanged. Between 1995 and 2015, March-April had average returns of 5.11 percent, November-December had average returns of 3.33 percent, and January-February had average returns of -0.04 percent. Annual returns from November to April, however, are roughly six times higher than those from May to October. As determined by (Zika & Paramita, 2021), on the Indonesian and Malaysian Stock Exchanges between 2017 and 2019, there was no difference in returns between the best and worst instances of the phenomena known as "sell-in-may-and-go-away." For some investors, SIMAGA no longer appears as a technique to purchase stocks at the best times and sell stocks during the worst times since it is not a phenomenon that contains good information that may affect stock price movements. As indicated by Waggle & Agrawal (2018), The Sell-In-May effect appeared to persist over time, but the oddity did not manifest itself in election-free years, according to the authors. In years without elections, there is no appreciable difference between May-October and November-April share returns.

The sell-in-May effect was caused by subpar stock returns from May through October before US presidential or legislative elections, which were followed by strong performance from November through April soon after the election. The effect's other possible explanations, such as emotional seasonality, weather, and daylight saving time, are not now commonly recognized. (Schabek & Castro, 2017) cite research findings showing that, even after adjusting for weather (sundial), behaviour (sentiment index), the number of initial public offerings (IPOs), and macroeconomic factors (industrial production), strategies beginning in October, November, and December can still achieve abnormal returns. (Guo et al., 2014) according to the results of their analysis, the Halloween impact could still be seen in 34 35 nations. In comparison to the buy-and-hold strategy, an aggressive trading approach that entails shorting the market in the summer and going long in the winter results in a 4.77 percentage point increase in profit. The endurance of the Halloween effect is given a fresh justification.

The market underperforms in the summer and recovers in the winter due to the positive feedback between investor beliefs and behaviour, culminating in a self-fulfilling prophecy. According to Carrazedo et al. (2016), if an investor follows the Halloween approach "blindly," it will produce an average yearly excess return of 2.42% above the buy-and-hold strategy while lowering risk across all indices by about 7.5% annually. The Halloween technique works in two out of every three calendar years. There have been a number of potential explanations for the anomaly, but one can adequately substantiate a seasonal effect. It proposes that a potential explanation relates to the negative average returns over the period from May to October, rather than the superior performance over the period from November to April. Based on the research results of these experts, for research questions 4a-4d, the theoretical hypotheses are as follows:

- H4a: SIMAG investment strategy had the best performance on IDX LQ45 in 1997-2022
- H4b: SIAB investment strategy had the best performance on IDX LQ45 in 1997-2022
- H4c: BAH investment strategy had the best performance on IDX LQ45 in 1997-2022

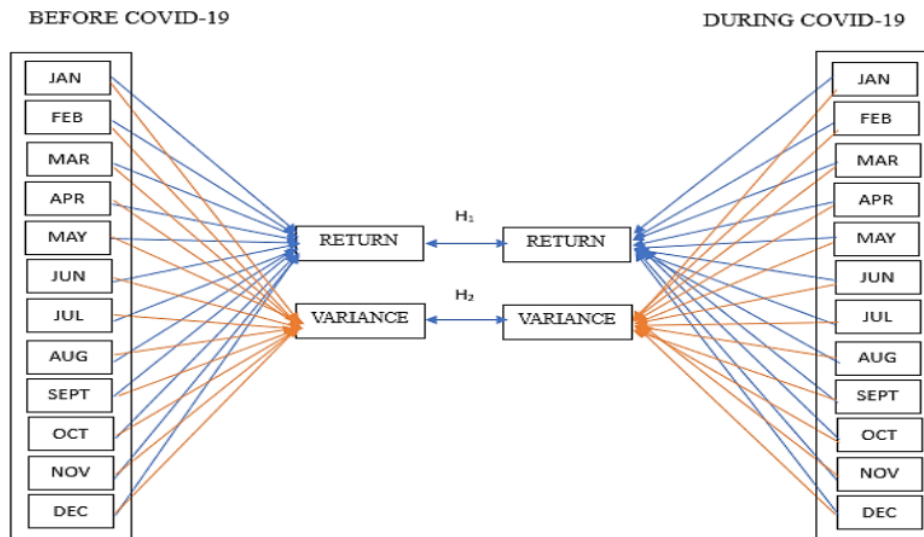


Figure 2 Research Framework (I)

Figure 2 shows the research framework developed to test the first hypothesis (H1) and the second hypothesis (H2). The tests carried out include Wilcoxon Sum Rank Test, F test and graph.

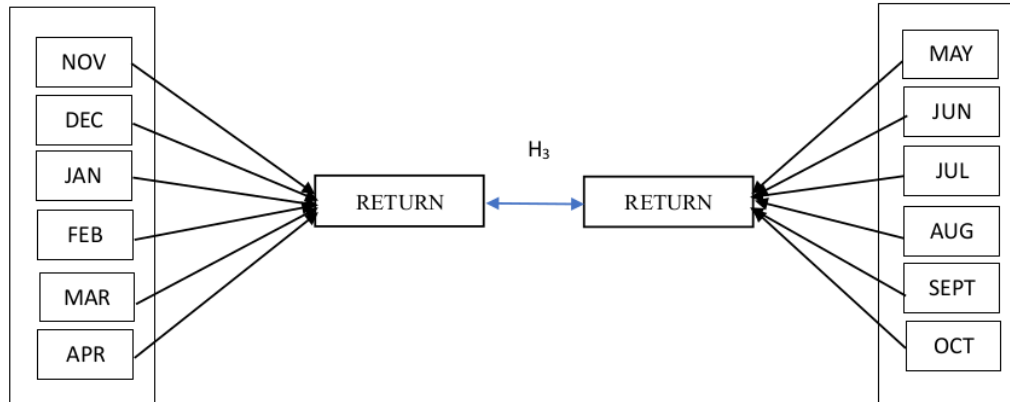


Figure 3 Research Framework (II)

Figure 3 shows the second research framework developed to test the third hypothesis (H3). The tests include the Wilcoxon Sum Rank Test for the third hypothesis (H3). Investment strategy calculations and graphs were conducted to test the fourth hypothesis (H4).

RESULTS AND DISCUSSION

The scope of this study is LQ45 monthly returns for the period February 1997 to December 2022. After obtaining LQ45 index data from Yahoo Finance, it was processed using Microsoft Excel and IBM SPSS 22.00.

Normality Test

The normality test aims to test the normality of the data distribution (Simanullang et al., 2023). For the normality test, the method to check normality is based on the histogram and normal p-plot of regression (Sianturi et al., 2021), and the condition is said to be normal if the Kolmogorov-Smirnov significance $> \alpha$ is used. The following results of normality testing can be seen in the table below.

Table 1 Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Jan	.204	25	.009	.836	25	.001
Feb	.130	25	.200*	.950	25	.252
Mar	.189	25	.022	.935	25	.116
Apr	.117	25	.200*	.973	25	.724
May	.135	25	.200*	.975	25	.764
Jun	.133	25	.200*	.958	25	.379
Jul	.103	25	.200*	.984	25	.957
Aug	.174	25	.050	.784	25	.000
Sept	.110	25	.200*	.977	25	.828
Oct	.179	25	.039	.808	25	.000
Nov	.181	25	.034	.765	25	.000
Dec	.141	25	.200*	.953	25	.292

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Source: SPSS result (2023)

Based on Table 1, the significance value (p) in the Kolmogorov-Smirnov test is 0.200 ($p > 0.05/2 = 0.025$), except for January and March, which are below 0.025, so overall the data is said to be

not normally distributed. H_a is accepted, meaning that the data comes from a population that is not normally distributed.

Wilcoxon Test

Discussion at this point reveals the impact of LQ45 returns during the period 1997-2022, followed by COVID-19 pandemic situation during the 2020-2022 period. The test results can be seen in the table below.

Table 2 Wilcoxon Sum Rank Test for Monthly Return LQ45

Group	Before			During			Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
	N	Mean Rank	Total Ratings	N	Mean Rank	Total Ratings					
Jan	2	13,73	302,00	3	7,67	23,00	17,000	23,000	-1,338	,181	,206b
Feb	2	12,77	281,00	3	14,67	44,00	28,000	281,000	-,418	,676	,723b
Mar	2	14,13	325,00	3	8,67	26,00	20,000	26,000	-1,164	,245	,275b
Apr	2	13,39	308,00	3	14,33	43,00	32,000	308,000	-,201	,841	,880b
May	2	13,74	316,00	3	11,67	35,00	29,000	35,000	-,441	,659	,705b
Jun	2	14,17	326,00	3	8,33	25,00	19,000	25,000	-1,244	,214	,242b
Jul	2	13,52	311,00	3	13,33	40,00	34,000	40,000	-,040	,968	1,000b
Aug	2	12,17	280,00	3	23,67	71,00	4,000	280,000	-2,448	,014	,008b
Sept	2	13,83	318,00	3	11,00	33,00	27,000	33,000	-,602	,547	,594b
Oct	2	13,04	300,00	3	17,00	51,00	24,000	300,000	-,843	,399	,442b
Nov	2	13,30	306,00	3	15,00	45,00	30,000	306,000	-,361	,718	,762b
Dec	2	14,26	328,00	3	7,67	23,00	17,000	23,000	-1,405	,160	,182b

a. Grouping Variable: Group
b. Not corrected for ties.

Source: SPSS result (2023)

Based on the results of the Z test, the probability of the Z test is generally above $\alpha (0.05/2) = 0.025$, except in August, which is below $\alpha (0.05/2) = 0.025$, which is 0.014. So, overall, accept $H_a (\mu_0 \neq \mu_1$, if the sig. (2 tailed) $> \alpha (0.05/2)$ then H_0 is accepted). This means, there is no negative effect of COVID-19 on the average monthly return pattern of LQ45 except in August.

F-Test

The F-test identifies whether there is a significant relationship occurring between the dependent variable and all of the independent variables. F-test uses the confidence level of 95% ($\alpha = 0.05$, which came from 100%-95%), and the F calculation is extracted and compared with the F table. The test results can be seen in the table below.

Table 3 Variance and Mean Return of LQ45 per Month (Total Variance, Variance Before COVID-19, and Variance During COVID-19)

Period		Mean	Variance	df	F-Test	$\rho (F \leq f)$ one-tail	F Critical one-tail
Jan	Before	0,031083	0,009790	21	10,6396	0,0893	39,4503
	During	-0,022474	0,000920	2			
Feb	Before	0,001233	0,002055	21	0,3728	0,0917	0,2262
	During	-0,000305	0,005512	2			
Mar	Before	0,017071	0,005062	22	0,3061	0,0572	0,2282
	During	-0,073540	0,016538	2			
Apr	Before	0,024654	0,011352	22	8,8704	0,1061	39,4525
	During	0,027860	0,001280	2			
May	Before	0,008572	0,006552	22	13,8487	0,0694	39,4525

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Period		Mean	Variance	df	F-Test	ρ (F<=f) one-tail	F Critical one-tail
Jun	During	-0,005002	0,000473	2	0,8921	0,3439	0,2282
	Before	0,021558	0,002840	22			
Jul	During	-0,022934	0,003183	2	1,6185	0,4518	39,4525
	Before	0,016506	0,003647	22			
Aug	During	0,007556	0,002253	2	50,8284	0,0195	39,4525
	Before	-0,053109	0,009393	22			
Sept	During	0,041441	0,000185	2	2,0766	0,3758	39,4525
	Before	-0,004016	0,010355	22			
Oct	During	-0,028053	0,004987	2	7,0314	0,1318	39,4525
	Before	0,003053	0,010294	22			
Nov	During	0,046570	0,001464	2	2,1147	0,3706	39,4525
	Before	0,017201	0,012306	22			
Dec	During	0,029549	0,005819	2	0,5554	0,1887	0,2282
	Before	0,046766	0,002326	22			
	During	-0,003787	0,004187	2			

Source: SPSS result (2023)

Based on Table 3, it is known that the results of the sig. (1 tailed) $> \alpha$ (0.05) except August, then accept H_a ($\sigma_1^2 > \sigma_2^2 =$ the LQ45 variance before the COVID 19 pandemic $>$ the LQ45 variance during the COVID-19 pandemic), or it can be said to accept H_0 (There is no negative effect of COVID-19 on LQ45 monthly return variance pattern).

Wilcoxon Sum Rank Test

The Wilcoxon Rank Sum Test is a comparative test with two independent samples if the scale is ordinal, interval, or ratio but not normally distributed. The comparative test in question is a test to find out the difference in the number of ratings between two groups. The test results can be seen in the table below.

Table 4 Wilcoxon Sum Rank for SIMAGA

Period	Non-SIMAGA (May-October)			SIMAGA (Nov-Des + Jan-Apr)			Man- Whitney U	Wilcoxon W	Z	Asymp .sign. (2-tail)	Sign. [2*(Sig. 1-tail)]
	N	Mean Rank	Total Ratings	N	Rankings Mean	Total Ratings					
1997	6	6,33	38,00	4	4,25	17,00	7	17	-1,066	,286	,352b
1998	6	5,33	32,00	6	7,67	46,00	11	32	-1,121	,262	,310b
1999	6	5,83	35,00	6	7,17	43,00	14	35	-,641	,522	,589b
2000	6	6,50	39,00	6	6,50	39,00	18	39	0,000	1	1,000b
2001	6	6,83	41,00	6	6,17	37,00	16	37	-,320	,749	,818b
2002	6	3,50	21,00	6	9,50	57,00	0,000	21	-2,882	,004	,002b
2003	6	7,00	42,00	6	6,00	36,00	15	36	-,480	,631	,699b
2004	6	5,67	34,00	6	7,33	44,00	13	34	-,801	,423	,485b
2005	6	6,17	37,00	6	6,83	41,00	16	37	-,320	,749	,818b
2006	6	4,50	27,00	6	8,50	51,00	6	27	-1,922	,055	,065b
2007	6	7,50	45,00	6	5,50	33,00	12	33	-,961	,337	,394b
2008	6	5,50	33,00	6	7,50	45,00	12	33	-,961	,337	,394b
2009	6	6,83	41,00	6	6,17	37,00	16	37	-,320	,749	,818b
2010	6	6,83	41,00	6	6,17	37,00	16	37	-,320	,749	,818b
2011	6	6,33	38,00	6	6,67	40,00	17	38	-,160	,873	,937b
2012	6	7,33	44,00	6	5,67	34,00	13	34	-,801	,423	,485b
2013	6	5,33	32,00	6	7,67	46,00	11	32	-1,121	,262	,310b
2014	6	4,50	27,00	6	8,50	51,00	6	27	-1,922	,055	,065b
2015	6	6,00	36,00	6	7,00	42,00	15	36	-,480	,631	,699b
2016	6	7,00	42,00	6	6,00	36,00	15	36	-,480	,631	,699b
2017	6	5,67	34,00	6	7,33	44,00	13	34	-,801	,423	,485b
2018	6	6,33	38,00	6	6,67	40,00	17	38	-,160	,873	,937b
2019	6	6,00	36,00	6	7,00	42,00	15	36	-,480	,631	,699b

Period	Non-SIMAGA (May-October)			SIMAGA (Nov-Des + Jan-Apr)			Man- Whitney U	Wilcoxon W	Z	Asymp. sign. (2-tail)	Sign. [2*(Sig. 1-tail)]
	N	Mean Rank	Total Ratings	N	Rankings Mean	Total Ratings					
2020	6	7,00	42,00	6	6,00	36,00	15	36	-.480	,631	,699b
2021	6	7,17	43,00	6	5,83	35,00	14	35	-.641	,522	,589b
2022	6	5,17	31,00	6	7,83	47,00	10	31	-1.281	,200	,240b

Source: SPSS results (2023)

From observations, in general, the Z-test results show a probability value $> \alpha = 0,025$ (0.05/2). So, rejecting H_a and accepting H_o (there is no difference indicating the occurrence of the SIMAGA effect except 2002). Furthermore, combined testing of all LQ45 return data was carried out, and the following results were obtained:

Table 5 Wilcoxon Sum Rank Test for LQ45 – SIMAGA

24 Group	N	Mean Rank	Sum of Ranks	Mann- Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
LQ45 Non-SIMAGA	156	148,72	23200,00	10954	23200	-	0,12757209
LQ45 SIMAGA	156	164,28	25628,00			1,5237463	
Total	312						

a. Grouping Variable: group
Source: SPSS result (2023)

Based on the output of Table 5, it is known that Asymp. Sig. (2-tailed) of $0.1275 > \alpha = 0.05/2 = 0.025$, so the decision is to reject H_{a3} and accept H_{o3} , namely, the return for May-October period is not lower than January-April plus November-December return on LQ45.

Analyse Investm²⁹ Strategy

In order to compare the Sell-In-May-And-Go-Away (SIMAGA) strategy with the Sell-In-August-Buy-In-November (SIABIN) strategy and the Buy-In strategy, the research results are displayed using graphs and summarized using tables. And-Hold (BAH) is a trading strategy based on simulations using historical data. The first of these measures involved an investment of IDR 1,000,000.00 in February 1997. Then, from January to December (BAH) and from December to July (SIABIN), invest money in LQ45 with a return on investment equal to (current month LQ45 / previous month LQ45) - 1. Additionally, from May to October (SIMAGA) and August to November (SIABIN), withdraw money from the market and place it in a time deposit with an expected annual return of 0.05%.

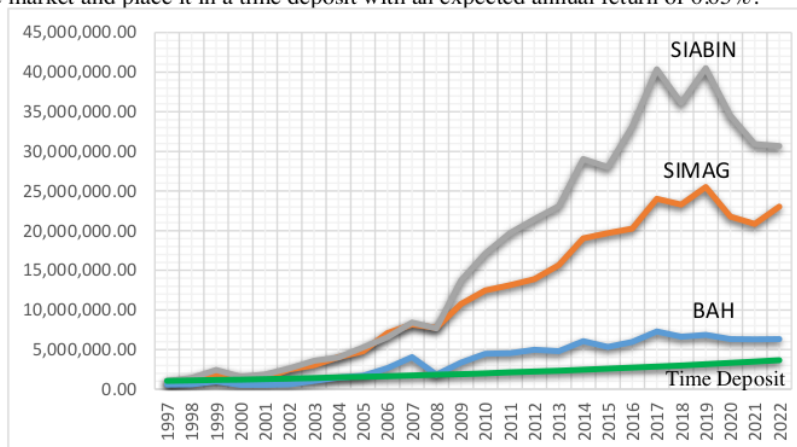


Figure 4 Return Simulation Test Result (SIMAGA, SIABIN, BAH, and Time Deposit)

Source: MS. Excel result (2023)

Based on figure 4, the best investment strategy is the SIABIN strategy because it produces the biggest return, which is IDR 30,693,263.97, then rejects Ho4a and accepts Ha4b (SIABIN investment strategy had the best performance on IDX LQ45 in 1997-2022).

Discussion of Findings

The effect of COVID-19 on average monthly return pattern of LQ45

There is no negative effect of COVID-19 on the average monthly return pattern of LQ45. This is proven by accepting H_0 ($\mu_0 \neq \mu_1$, if the sig. (2 tailed) $> \alpha$ (0.05/2) then H_0 is accepted). The results of this study are in accordance with the results of research by (Dichtl & Drobetz, 2014), which declare that the overall results are consistent with the notion of effective capital markets.

The effect of COVID-19 on the pattern of variance LQ45 monthly return.

There is no negative effect of COVID-19 on LQ45 monthly return variance pattern, except in August. This is proven from the F-test, by accepting H_0 (the sig. (1 tailed) $> \alpha$ (0.05), then accepting H_0 ($\sigma_1^2 > \sigma_2^2 =$ the LQ45 variance before the COVID-19 pandemic $>$ the LQ45 variance during the COVID-19 pandemic). The results of this study are in accordance with the results of Hapsari & Sumarsono (2020), Dichtl & Drobetz (2014), Andrade et al. (2013), and Fisher (2014), who stated that the effect of the SIMAGA phenomenon on risk was found to be insignificant. Overall, the research findings support the theory of efficient capital markets, as we find a lack of a SIMAGA effect, as well as, on average, higher returns for the November - April half-year period.

Analyse whether LQ45 monthly return has the SIMAGA effect.

The return for May-October period is not lower than January-April plus November-December return on LQ45. This is evidenced by the results of the Wilcoxon Sum Ranks Test, in general, the Z-test results show a probability value $> \alpha = 0.025$ (0.05/2), and the non-SIMAGA mean ranks (May-October) are generally higher than the mean ranks SIMAGA (November-December plus January-April). The research results are in accordance with the results of Hapsari & Sumarsono (2020), Carrazedo et al. (2016), Dichtl & Drobetz (2014), and Fisher (2014), who state that the effect of the SIMAGA phenomenon on risk is insignificant, there is no sufficient explanation for the seasonal effects, especially the SIMAGA effect, and research findings show more support for the efficient capital market theory.

Analyse Investment Strategy

SIABIN investment strategy had the best performance on IDX LQ45 in 1997 - 2022, as evidenced by the investment returns of IDR 30,693,263.97, so it accepts Ha4b. The results of this study are in accordance with the results of Zarika & Paramita (2021), Wagle & Agrawal (2018), Hapsari & Sumarsono (2020), and Fisher (2014), who mentioned SIMAGA as a strategy of buying stocks in the best period and selling them in the worst period is no longer valid, found a lack of a reliable SIMAGA effect. Other potential explanations for the effect, including seasonal affective disorder, weather, and daylight saving time, are not widely accepted. The effect of the SIMAGA phenomenon on risk was found to be insignificant, and increasing emphasis was placed on the corresponding durability of returns.

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CONCLUSION

Based on the results of this study, it can be concluded that there is no negative influence of COVID-19 on the average monthly return pattern of LQ45, except in August. Then there is no negative influence of COVID-19 on the LQ45 monthly return variance pattern, except in August. Furthermore, the May-October period return is not lower than the January-April return plus the November-December return on the LQ45, except in 2002. The SIABIN investment strategy has the best performance on the IDX LQ45 in 1997-2022. This study has several limitations, namely research limited to companies listed on the IDX and included in the LQ45 period February 1997-December 2022. Then the time deposit interest rate is set at 5% per year. Based on these limitations, future researchers are advised to increase the number of research samples on a wider index or focus on company business groups, for example on KOMPAS100, IDX 30, IDX 80, or sectoral or industry groups on the IDX. Then it is

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recommended to add the use of dummy variable regression models to investigate returns and risk (variance).

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