The Effects of the Monetary Policy on the Banking Sector Index in Indonesia during the COVID-19 Pandemic: An Event Study Analysis

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ABSTRACT*: Using the event study method, this paper examines the impact of 31 monetary policy announcements in the form of the policy rate during the COVID-19 period on the financial sector's performance in the Indonesia Stock Exchange. This study also analyzes the effect of monetary policy announcements when the policy interest rate is unchanged, decreases, and increases compared to the previous period. We found that all 31 policy rate announcements had no significant impact on the announcement day or Day 0. When the policy rate decreased during the event window, Abnormal Return (AR)was significantly positively influenced. Cumulative Abnormal Return (CAR) also experienced a positive upward trend. Furthermore, when the policy rate is unchanged, we found a significant negative effect on AR and CAR, showing greater dynamics response in unchanged monetary policy announcements and tending to be in a negative trend. Furthermore, when the policy rate increased, the impact on the financial sector AR was significantly positive, while CAR showed a dynamic response. This indicates that the financial sector's response to monetary policy, which increases policy interest rates, is better than when monetary policy is unchanged or reduced.*

KEYWORDS -*event study; financial sector index; monetary policy announcement*

I. INTRODUCTION

The emergence of the COVID-19 pandemic since December 2019 has brought about structural changes in various aspects of life globally. World Health Organization (WHO) declared COVID-19 as a pandemic disease that can spread quickly and widely, resulting in the deaths of millions of people worldwide. This situation subsequently resulted in economic uncertainty in the financial markets and had significant short-term and long-term economic consequences for global finance. The impact of COVID-19 can affect aggregate demand and supply. After all, the government's efforts to mitigate transmission must establish a policy limiting people's mobility to carry out a lockdown. International Monetary Fund (IMF) expressed concern about this development, as reflected in its initial report in April 2020. IMF predicted that GDP growth in 2020 would fall by 3%. Under these conditions, the relevant authorities are required to be able to formulate appropriate and effective policies, particularly from a monetary policy standpoint.

Based on the pandemic background, it is necessary to investigate the impact of the Bank Indonesia 7-day reverse repo rate (policy rate) announcement during the COVID-19 pandemic period on financial sector stock return in Indonesia. Given its vital role in the monetary policy transmission mechanism, it is essential to analyze the financial sector to achieve the ultimate monetary policy target: economic stability and financial stability. Overall, our research investigates the effect of the monetary policy rate announcement during the COVID-19 pandemic on the financial sector in Indonesia. For this purpose, we apply an event study methodology based on daily data on the Indonesian Stock Exchange's financial sector stock returns from 7 October 2019 to 3 November 2022.

According to MacKinlay (1997), the event study methodology generally divides the data into estimation, event, and post-even windows. Furthermore, in their empirical study, Günay and Bayraktaroğlu (2022) found that the impact of policy rate announcements is weak for the tourism sector stock. In this study, we use an estimation window of 120 days and an event window of 10 days before and after the policy rate announcement as the decisions of the Bank Indonesia Board of Governors Meeting. We do not see a post-even window because, generally, it is used for the longer-term horizon. This study wants to analyze the short-term effects of the policy rate announcement resulting from the Board of Governors Meeting. The results of this research are expected to provide input for investors in the stock market, especially in the financial sector and related authorities, especially in looking at the impact of the central bank policy rate during the COVID-19 pandemic period on the financial sector index in Indonesia.

II. LITERATURE STUDY

Monetary policy has the main objective of maintaining price and macroeconomic stability. However, the effect of monetary policy also has sentiment and impacts on the stock market. In this regard, it is essential to observe and study the effect of monetary policy announcements on the stock market, as one of the financial sectors, which is the important channel of the central bank's monetary policy transmission mechanism through the asset price channel. Warjiyo and Juda (2002) found that even though monetary shock could alter stock portfolios, they failed to be transmitted further to inflation.

According to Fama (1970), efficient market prices should "fully reflect" available information. His empirical study divided the efficient market hypothesis into three categories, they are strong-form that concerned with whether investors have monopolistic access to any relevant information; second is semi-strong-form related to publicly available information can be enjoyed by all investors; and weak-form that related to historical price—this information including monetary policy announcements, especially policy rate announcements. Thus, when monetary policy decisions are announced, what will move stock prices are announcements that deviate from what market participants expect. Furthermore, Thorbecke (1997) found that monetary policy affects ex-ante and ex-post stock returns.

Many researchers have investigated the effects of COVID-19 on the stock market in various countries, industrial sectors, and individual companies. Several studies conducting event studies on the impact of the COVID-19 pandemic and the COVID-19 period on the stock market included Günay and Bayraktaroğlu (2022), who examined the effect of policy interest rate announcements on the tourism sector in Istanbul. Event study research conducted by Günai and Bayraktaroğlu (2022) on the tourism sector in Borsa Istanbul found that the announcement of the interest rate policy did not have a significant effect on day 0. Maran (2022) examines the impact of monetary policy shocks on the stock market in the Philippines, and Zarei and Honarmandi (2021) studied the impact of the COVID-19 outbreak on the stock sector in Tehran.

Alam et al. (2020) examined the impact of the COVID-19 outbreak on stock performance in Australia. He found that the transportation, real estate, and energy sectors experienced a decrease in Cumulative Abnormal Returns (CAR) during the COVID-19 period, mainly due to restrictions on people's mobility. Meanwhile, Zuhro (2022), who examined the effectiveness of policies in the COVID-19 period, specifically related to credit, found that these policies were quite effective in reducing the volatility of banking sector stock returns in the early period of COVID-19, which is March 2020 compared to before the policy was taken.

Hsing (2013), who used GARCH to examinethe effects of monetary and fiscal policy on the stock market in Poland, found that monetary policy in the form of an increase in policy interest rates had a negative impact on the composite stock index in the 2013 period before the COVID-19 pandemic. Furthermore, several studies have assessed the impact of unanticipated monetary policy changes on stock returns, such as Maran (2022). The main conclusion from this study is that monetary policy shocks significantly impact the stock market in the Philippines, especially during the period of mobility restrictions due to the COVID-19 pandemic.

The COVID-19 variable has been widely used in recent research because it is an unprecedented shock to economic activity worldwide. These events led to a growing literature on the impact of pandemic-related policy responses on financial markets. In line with Maran (2022), Zarei and Honarmandi (2022) also considered the COVID-19 outbreak variable in conducting an event study on stock returns in Tehran. They found that the financial sector was one of the sectors that received an increase in the average return on the Tehran stock market.

III. METHODOLOGY

The Event study has gained popularity among scholars because of its powerful and effective features in fulfilling various goals. Wang and Ngai (2020) have identified primary clusters, namely "environmental and CSR events," "monetary policy," market-related events," and "cross-border M&A." Technically, according to Mackinlay (1997), the initial task of conducting an event study is to determine a particular event and identify the period in which the stock prices associated with the event will be tested through the event window in a few days. Furthermore, MacKinlay (1997) also mentions that to carry out event identification, it is necessary to determine the selection criteria for the inclusion of certain companies in this study. At this stage, it is helpful to summarize some of the characteristics of the sample and note any potential sample selection bias.
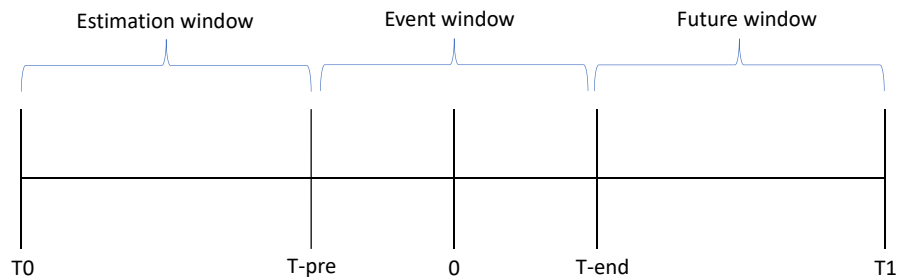The timeline of an event study can be shown in Fig. 1.

Figure 1. Event Study Timeline

The estimation window is used to determine the normal behavior of the stock market factors. Meanwhile, in the event window, we use data from this period to determine whether the event announcement was anticipated or leaked, and also the post-announcement or future window effect of how long it took for the event information to be absorbed by the market.

Furthermore, assessing the impact of an event requires a measure of abnormal return. The abnormal return itself is defined as the actual return during the event window minus the normal return during the event window.

To calculate the actual return, the formula will be used

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}} \qquad (1)$$

which is expressed in logarithmic form

$$R_t = ln \frac{P_t}{P_{t-1}}. \qquad (2)$$

The normal return is defined as the expected return without conditioning on events that occur and is denoted as follows:

$$AR_{it} = R_{it} - E(R_{it}|X_t) \qquad (3)$$

where AR_{it} is abnormal return, R_{it} is actual return, and $E(R_{it}|X_t)$ is normal return, while $|X_t$ is conditional information for normal return model.

To calculate Abnormal Return (AR), several methods can be used. However, in this study, only one approach will be used to calculate abnormal return (AR), i.e., the risk-adjusted model (RAR). The first is the mean-adjusted return model (MAR), which is denoted by

$$AR_t = R_t - \bar{R}_j, \qquad (4)$$

where R_t is the stock return at time t and $\bar{R}_j$ is the average return on the stock. The second method used is the market-adjusted return model (MKAR)

$$AR_t = R_t - R_{Mt} \qquad (5)$$

where R_{Mt} is market return at time t.

Furthermore, the third method is the risk-adjusted returns model (RAR)

$$AR_t = R_t - (\hat{\alpha} + \hat{\beta} R_{Mt}) \qquad (6)$$

where α and β are estimated by regression of the stock index to the market index.

Then, AR_t must be aggregated to describe overall inferences from the event of interest. It is called the cumulative abnormal return (CAR_t). The aggregation can be done in two ways: based on time or across the stock. In this study, a time-based aggregation approach will be used, which is denoted as follows

$$CAR_t = \sum_{t=1}^{n} AR_t \qquad (7)$$

where CAR_t is sum of AR_t of the beginning day "t" to n.

Furthermore, to test the hypothesis that the event has an impact on returns, a t-test will be used with the formula

$$t = \frac{AR_t}{\sigma} \qquad (8)$$

where σ is the standard deviation of the estimated window return.

This study will use data from the CEIC database, i.e., daily closing data on the Jakarta Composite Index (JCI) and financial sector indexes. In addition, this research refers to Bank Indonesia's website on the policy rate announcement as the result of the Monthly Board of Governors Meeting. Bank Indonesia's policy rate refers to Bank Indonesia's 7-day Reverse Repo Rate (Fig. 2). Referring to the government's decision to stipulate a COVID-19 pandemic situation based on the Presidential Decree dated 13 April 2020 (Presidential Decree No. 12 of 2020) concerning the Stipulation of non-natural disasters for the spread of coronavirus disease 2019 (COVID-19)), the policy rate announcements taken are from April 2020 to the most recent October 2022. Based on this period, we got 31 policy rate announcement events divided into 3 events that increased the policy rate, 24 events that did not change the policy rate interest rate, and 4 events that lowered the policy rate.

Next, we conducted an event study analysis to see the reaction from the financial sector on the IDX to the policy rate announcement. The financial sector was chosen because the financial sector, especially the banking sector, is the main channel of the monetary policy transmission mechanism in achieving the ultimate target of maintaining economic and financial stability. This Event study analysis is carried out by calculating the daily return on the JCI and the financial sector, calculating the parameter estimation window for 120 days, calculating the Abnormal Return (AR) in the 10 day event window (-10, 10) by calculating the difference between the actual daily return and the return obtained from the risk-adjusted return model. We use Alam et al. (2020) as a reference that suggested using 120 days estimation window and a 10-day event window. The last one in this study will also calculate the Cumulative Abnormal Return (CAR) in the event window (-10, 10) to investigate the trend in the announcement window. We also conduct a significance test using the t-test method on the event window and event date.
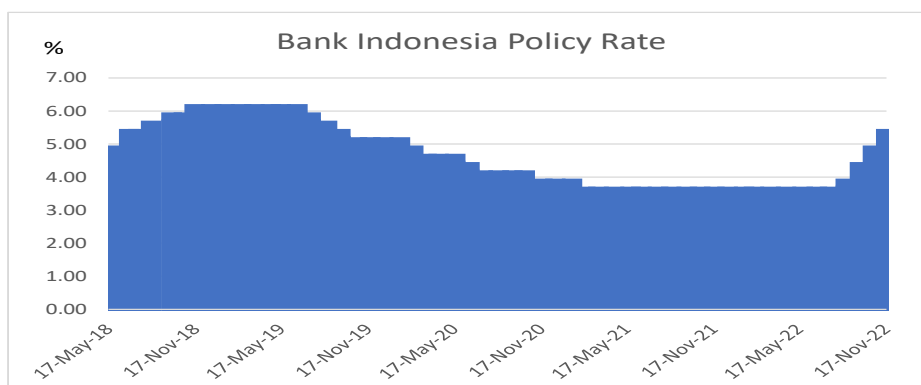
Source: www.bi.go.id
Figure 2. The Policy Rate Bank Indonesia 7 Days Repo Rate Announcement (BI7DRR)

IV.   ANALYSIS

In the event announcement of the policy rate decreased during the COVID-19 pandemic (Table 1), all events were observed to get a significant positive effect on the abnormal return in the financial sector before the event, namely days -8 and -6 (the week before). We can see it on the announcement on June 18, 2020, with AR 1.67% on day -8, on July 16, 2020, with AR 1.50% on day -6, on November 18, 2020, with AR 1.21% on day -6, and on February 18, 2021, with AR 1.29% on day -6. In addition, AR, after the policy rate announcement event on November 18, 2020, had a significant negative effect on the financial sector at +6 and +10 days (the week after), i.e., -1.16% and -1.18%. However, at the policy rate announcement on 18 February 2021, the effect on AR in this sector was significantly positive on day +7 at 1.22%. It is important to note that the event date of the policy rate announcement (day 0) did not significantly affect the AR of the financial sector. Based on these findings, it can be concluded that during the 10-day event window before and after the event date, the AR of the financial sector will be significantly affected (generally positively affected) by the policy rate announcement, which decreases the interest rate.

Table 1. Abnormal Return for Policy Rate Decrease Announcements.

Event Day	18-Jun-20	Sig	16-Jul-20	Sig2	18-Nov-20	Sig3	18-Feb-21	Sig4
-10	0.11%		-0.74%		-0.41%		0.50%	
-9	0.13%		-0.42%		0.23%		0.23%	
-8	1.67%	**	0.10%		-0.51%		-0.31%	
-7	-0.05%		0.12%		0.38%		0.03%	
-6	-0.32%		1.50%	*	1.21%	*	1.29%	**
-5	-0.53%		-0.21%		-0.13%		-0.22%	
-4	1.20%		0.59%		-1.00%		-0.04%	
-3	-1.36%		-0.29%		0.49%		-0.37%	
-2	1.03%		-0.28%		-0.64%		0.43%	
-1	-0.67%		-0.46%		-0.62%		0.58%	
0	0.10%		-0.69%		0.22%		0.09%	
1	-0.02%		-0.63%		-0.28%		0.43%	
2	-0.19%		-0.03%		-0.19%		0.06%	
3	0.43%		0.35%		-1.02%		-0.23%	
4	1.24%		-0.12%		-0.46%		0.83%	
5	0.19%		0.14%		0.61%		-0.02%	
6	-0.23%		-0.15%		-1.16%	*	0.15%	
7	0.42%		0.68%		-0.98%		1.22%	**
8	0.71%		0.59%		0.50%		-0.42%	
9	0.83%		-0.67%		0.12%		0.85%	
10	-0.68%		0.49%		-1.18%	*	-0.24%	

Note: t-statistics with *, **, *** denotes statistical significance at 10%, 5%, 1% level of significance
Source: Authors' calculation based on the CEIC data.

Furthermore, 24 policy rate announcement events (out of 31 observation periods) maintained the BI7RRR rate (Table 2). Of the 24 events, 6 events in 2020, 11 events in 2021, and the remaining 7 events in 2022. Overall, during the window events before the policy rate announcement, there was generally a significant effect on the AR of the financial sector, which can be viewed in 15 of the 24 event periods COVID-19 until October 2022. Furthermore, 9 events experienced a significant effect 10 days before and after the event date, 3 events experienced a significant effect 10 days before the event date (on August 19, 2021, significant AR on day -1 at -1.26% and day -8 at -1.78%; on February 10, 2022, significant AR on day -2 at 0.97%; and on March 17, 2022, significant AR on day -8 at -0.87% and day -9 at -0.79%), and 3 events experienced a significant effect 10 days after the event date (on December 17, 2020, significant AR on day 2 at -1.03%; on September 21, 2021, significant AR on day 5 at -0.96%; and on November 18, 2021, significant AR on day 3 at -1.04%).

Based on the time horizon, during 2020, 3 of the 6 events experienced a significant influence from the policy rate announcement in the event window, and 3 other events did not experience a significant effect. In 2021, out of 11 events, 6 events were significantly affected by the policy rate announcement. Meanwhile, 2022 has the most significant impact because out of 7 events of the policy rate announcement that were unchanged, the 6 events have had a significant impact on the AR of the financial sector.

Based on the type of influence, in the 10-day event window of the policy rate announcement that maintained the current rate, the policy rate had a significant negative effect on the financial sector's AR in 9 events before the event date and 9 events after the event date. Meanwhile, there were AR 4 events before and 5 events after the event date for the positive influence on the financial sector. Thus, based on these findings, it can be concluded that during the event window 10 days before and after the policy rate announcement, which retained the policy rate, there was a significant effect on the AR of the financial sector and was generally a negative influence.

Table 2. Abnormal Return for Unchanged Policy Announcements.

Event Day	14-Apr-20	Sig	19-May-20	Sig2	19-Aug-20	Sig3	17-Sep-20	Sig4	13-Oct-20	Sig5	17-Dec-20	Sig6	21-Jan-21	Sig7	18-Mar-21	Sig8	20-Apr-21	Sig9	25-May-21	Sig10	17-Jun-21	Sig11	22-Jul-21	Sig12
-10	0.07%		1.48%	**	-0.14%		0.37%		0.15%		-1.10%	*	0.02%		0.83%		-0.39%		0.47%		0.29%		0.02%	
-9	-2.11%	***	-0.48%		-0.98%		-0.28%		-0.67%		0.39%		-0.74%		-0.28%		0.03%		-0.16%		0.34%		0.55%	
-8	-0.07%		0.38%		-0.42%		-0.85%		0.24%		-0.22%		1.44%	***	0.88%		-0.05%		-0.51%		-0.67%		-0.67%	
-7	-1.78%	***	-0.93%		0.14%		0.36%		0.02%		-0.85%		0.77%		-0.26%		0.74%		0.36%		-0.23%		0.70%	
-6	-0.41%		0.12%		-0.22%		-0.08%		0.45%		-0.56%		-0.56%		0.04%		0.59%		0.93%		0.59%		0.36%	
-5	-0.78%		-1.18%	*	-0.29%		-0.29%		0.71%		0.48%		-0.51%		0.12%		-0.28%		-1.05%	*	0.58%		-0.19%	
-4	0.34%		-0.17%		1.25%		-1.09%		0.20%		0.49%		-0.40%		-0.83%		0.63%		-0.24%		-0.61%		0.57%	
-3	0.16%		-1.84%	***	-0.22%		-0.05%		-0.09%		-0.71%		0.11%		-0.24%		-0.30%		-0.64%		0.00%		0.06%	
-2	-1.16%	**	-2.55%	***	0.27%		-0.81%		0.46%		-0.17%		0.48%		-0.14%		-0.41%		0.71%		-0.48%		-0.04%	
-1	-0.69%		-0.79%		0.33%		-0.19%		0.92%		-0.93%		0.30%		-0.38%		0.32%		0.64%		-1.28%	**	0.35%	
0	-0.54%		1.04%		0.21%		-0.34%		0.91%		0.40%		-0.70%		0.25%		-0.64%		0.34%		0.38%		0.50%	
1	0.00%		2.28%	***	0.39%		-1.04%		-0.23%		-0.93%		1.00%	*	-0.44%		-0.13%		-1.09%	**	0.69%		0.13%	
2	-0.15%		0.15%		0.67%		0.36%		-0.19%		-1.03%	*	1.00%	*	-0.58%		-0.03%		0.77%		-0.25%		-0.13%	
3	-0.06%		0.55%		0.03%		-0.50%		-0.60%		0.86%		0.00%		0.02%		0.30%		0.12%		0.42%		0.16%	
4	0.01%		2.14%	***	0.69%		0.00%		0.57%		0.20%		-0.29%		0.21%		-0.87%		-0.66%		-1.21%	**	0.31%	
5	-0.55%		0.57%		-0.19%		0.12%		0.15%		-0.20%		1.01%	*	-0.77%		0.73%		0.25%		0.31%		-0.36%	
6	-0.82%		1.27%	*	-0.65%		0.59%		-0.58%		0.10%		-0.76%		-0.13%		-0.47%		0.36%		-0.05%		-0.40%	
7	-0.63%		1.10%		0.44%		-0.70%		0.26%		0.53%		-1.27%	**	-0.22%		0.00%		-0.67%		-0.08%		-0.69%	
8	-1.43%	**	0.10%		-0.26%		0.08%		-0.27%		-0.72%		-0.29%		0.22%		-0.72%		-0.18%		-0.18%		0.61%	
9	-0.39%		0.15%		0.37%		-0.72%		0.59%		0.42%		0.48%		-0.70%		0.13%		0.57%		0.37%		0.79%	
10	-2.05%	***	1.73%	**	-0.29%		0.31%		0.23%		0.16%		0.21%		-0.31%		0.18%		0.55%		-0.49%		1.81%	***

Event Day	19-Aug-21	Sig	21-Sep-21	Sig2	21-Oct-21	Sig3	18-Nov-21	Sig4	16-Dec-21	Sig5	20-Jan-22	Sig6	10-Feb-22	Sig7	17-Mar-22	Sig8	19-Apr-22	Sig9	24-May-22	Sig10	23-Jun-22	Sig11	21-Jul-22	Sig12
-10	-0.58%		0.54%		0.27%		-0.34%		-0.30%		0.24%		-0.56%		-0.55%		-0.90%	**	0.88%	*	0.09%		0.69%	
-9	-0.76%		-0.18%		0.01%		-0.02%		-0.02%		-0.07%		0.09%		-0.79%	*	-0.55%		-0.19%		0.02%		0.41%	
-8	-1.78%	***	-0.38%		-0.04%		0.71%		0.46%		1.24%	***	0.41%		-0.87%	**	-0.53%		-0.48%		-0.14%		0.39%	
-7	0.83%		0.34%		-0.08%		-0.30%		0.48%		0.57%		-0.20%		-0.39%		0.33%		0.74%		-0.58%		0.33%	
-6	0.07%		0.32%		0.28%		-0.04%		0.18%		-1.05%	**	0.39%		0.10%		-1.06%	**	-0.86%	*	0.74%		0.55%	
-5	-0.10%		-0.72%		-0.14%		0.11%		-0.26%		-0.48%		-0.42%		0.49%		-1.27%	***	-0.55%		0.43%		-1.49%	***
-4	0.70%		-0.26%		-0.21%		-0.53%		-0.42%		0.03%		-0.32%		-0.49%		0.26%		-2.00%	***	0.85%		1.64%	***
-3	-0.54%		0.46%		0.40%		0.36%		0.33%		0.30%		-0.23%		0.25%		-0.87%	**	0.41%		0.02%		1.08%	*
-2	-0.63%		-0.12%		0.58%		0.20%		-0.14%		0.42%		0.97%	**	0.47%		0.19%		-1.21%	**	-0.20%		-0.19%	
-1	-1.26%	**	0.81%		0.35%		0.31%		0.25%		-0.36%		-0.23%		0.33%		-0.75%	*	0.21%		-0.48%		0.41%	
0	0.15%		-0.70%		0.91%		-0.31%		0.37%		-0.37%		-0.47%		-0.16%		0.64%		-1.02%	**	-0.44%		0.51%	
1	-0.29%		0.24%		0.44%		-0.82%		-0.41%		-0.38%		-0.09%		-0.07%		1.55%	***	-0.33%		-0.07%		-0.34%	
2	0.41%		0.66%		-0.13%		0.25%		-0.12%		-0.23%		-0.49%		-0.72%		0.57%		0.20%		0.79%		-0.09%	
3	0.31%		-0.27%		0.01%		-1.04%	**	-0.04%		-0.78%	*	0.15%		-0.68%		0.11%		0.56%		-0.66%		0.86%	
4	0.01%		-0.30%		-0.32%		0.18%		0.03%		-0.59%		0.13%		-0.33%		0.46%		-0.51%		0.59%		-0.67%	
5	0.26%		-0.96%	*	0.39%		0.03%		0.10%		0.17%		0.04%		-0.23%		0.31%		-1.27%	**	-0.51%		1.00%	*
6	0.20%		-0.56%		0.17%		0.04%		-0.27%		0.38%		-0.08%		0.11%		-0.04%		-0.50%		-0.20%		0.22%	
7	0.51%		0.54%		-0.34%		0.37%		-0.38%		-0.21%		0.63%		-0.25%		0.56%		0.23%		-0.12%		0.15%	
8	0.24%		0.39%		0.27%		0.32%		-0.08%		0.35%		-0.14%		0.15%		0.91%	**	-0.95%	*	-0.09%		-0.17%	
9	-0.23%		-0.17%		0.27%		-0.27%		-0.23%		-0.43%		-0.37%		-0.09%		-0.20%		0.24%		0.80%		0.19%	
10	0.22%		-0.16%		-0.32%		-0.25%		-0.58%		-0.36%		-0.78%		-0.23%		-0.51%		0.06%		0.69%		-0.16%	

Note: t-statistics with *, **, *** denotes statistical significance at 10%, 5%, 1% level of significance
Source: Authors' calculation based on the CEIC data.

Furthermore, for the policy rate announcement, which decides the increasing rate, during the observation period, there were 3 events, all of them in 2022 (Table 3): on the 23rd of August, the 22nd of September, and the 20th of October. Overall, the Board of Governor Meeting decision that increases the policy rate generally significantly affects the AR of the financial sector in all event windows. A total of 2 events experienced a significant effect before and after the announcement of the increasing policy rate, i.e., on August 23, 2022, and on October 20, 2022; and 1 event only experienced a significant effect before the announcement, that is, on September 22, 2022.

Based on the effect type, in the 10 days event window, the announcement of an increasing policy rate had a significant negative effect on the AR of the financial sector 2 times before the event date, i.e., on August 23, 2022, on day -4 at -1.02% and on October 20, 2022, on day -3 at -1.24%; and then, 1 time after the event date on October 20, 2022, on day 4 at -1.41%. Meanwhile, for a positive influence on financial sector AR, 2 times before the event date on September 22, 2022, on day -7 at 1.13% and 3 times after the event date on August 23, 2022, on day 6 at 1.40% and on October 20, 2022, on day 1 and 2 at 1.09% and 1.11%. Thus, the policy rate announcement can be viewed in the short term as a significant influence on more abnormal returns in the financial sector stocks.

Table 3. Abnormal Return for Increasing Policy Rate Announcements

Event Day	23-Aug-22	Sig	22-Sep-22	Sig2	20-Oct-22	Sig3
-10	0.06%		0.20%		0.57%	
-9	0.25%		-0.24%		-0.03%	
-8	0.17%		-0.42%		-0.40%	
-7	-0.34%		1.13%	*	0.18%	
-6	-0.23%		-0.06%		-0.16%	
-5	-0.02%		0.70%		-0.23%	
-4	-1.02%	*	-0.09%		-0.02%	
-3	-0.43%		0.02%		-1.24%	**
-2	-0.13%		-0.66%		1.11%	*
-1	0.27%		0.27%		1.09%	*
0	**-0.32%**		**-0.30%**		**-0.39%**	
1	-0.18%		0.43%		1.09%	*
2	0.39%		0.95%		1.11%	*
3	0.31%		-0.06%		0.11%	
4	-0.80%		0.06%		-1.41%	**
5	0.12%		-0.40%		0.17%	
6	1.40%	**	0.36%		-0.32%	
7	0.19%		-0.25%		0.35%	
8	0.23%		0.07%		-0.48%	
9	-0.33%		0.10%		-0.03%	
10	-0.37%		0.59%		0.50%	

Note: t-statistics with *, **, *** denotes statistical significance at 10%, 5%, 1% level of significance
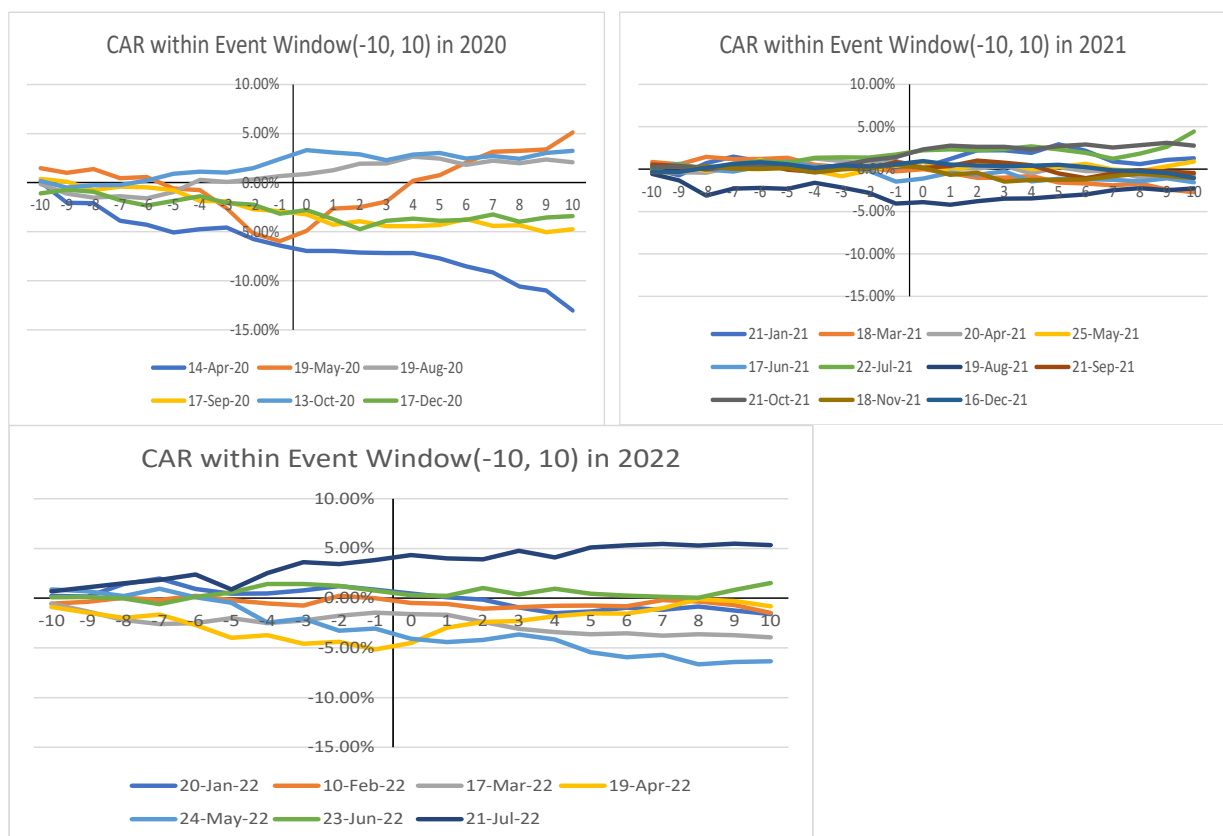Source: Authors' calculation based on the CEIC data

During the announcement of the policy rate decline, it can be viewed that for ten days after the announcement, the financial sector experienced a dynamic response in the form of an increasing CAR trend even though there was one period of negative CAR trend (Fig.3). Nonetheless, the dynamics of CAR from day 0 to day 10 rate were lower than the dynamics that occurred when the announcement of maintaining policy rate, especially in 2020.
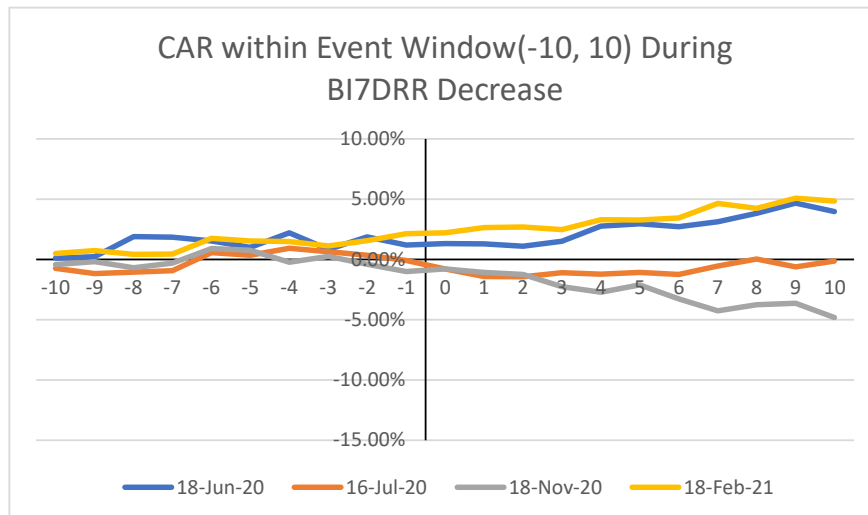
Source: Authors' calculation based on the CEIC data.
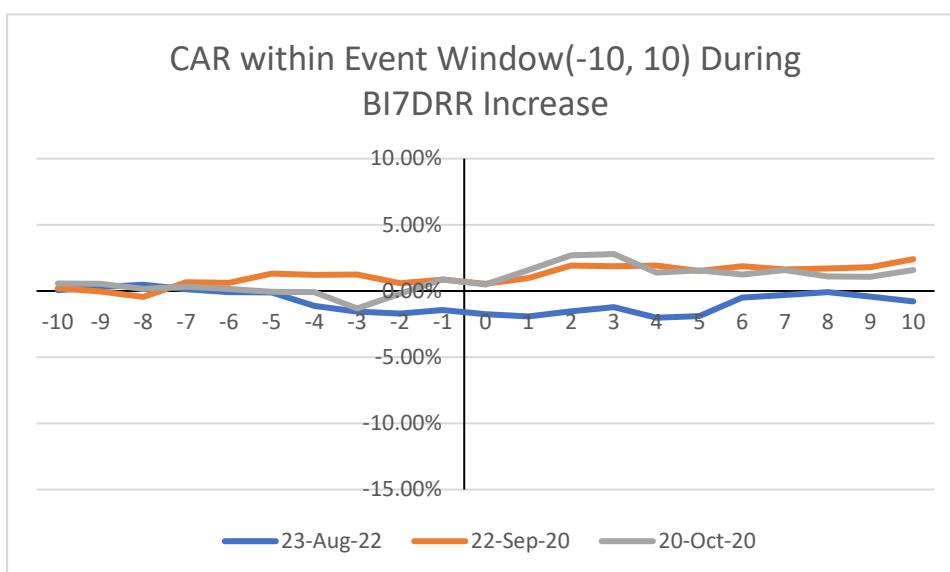**Figure 3.** Cumulative Abnormal Return Financial Sector Stocks in the Unchanged Policy Rate

If we look at the CAR, as shown in Fig.4, in the unchanged policy rate announcement event, from day 0 to day 10, it can be seen that in 2020 the volatility was relatively high, especially in April 2020 during the early pandemic in Indonesia and indicates a decreasing trend in CAR. However, in the following months of 2020, CAR in the financial sector became relatively stable. Furthermore, in 2021, it can be seen that the CAR dynamics of the financial sector have been relatively stable throughout the year. Whereas in 2022, the dynamics of the banking sector's CAR are again showing dynamics, especially in the second quarter of 2022, which showed a downward trend in CAR in May 2022 but then reversed to a positive trend in July 2022.

Source: Authors' calculation based on the CEIC data.
Figure 4. Cumulative Abnormal Return (CAR) in the Unchanged Policy Rate

The dynamics in the financial sector were relatively more stable during the event window around the central bank's policy of increasing the policy rate. This is reflected in the CAR movement on days 0 to 10, which is relatively stable, not exceeding 5% either up or down (Fig.5).

Source: Authors' calculation based on the CEIC data.
Figure 5. Cumulative Abnormal Return (CAR) of Increasing Policy Rate

These findings indicate that the financial sector was quite sensitive to the announcement of the central bank's policy rate during the COVID-19 pandemic. This condition can be seen especially when the COVID-19 case handling management is uncertain. It happened because the causes still need to be understood and there needs to be information on dealing with COVID-19 effectively. This phenomenon has encouraged the government to limit people's mobility, which could affect economic activities in transportation, food, beverages, and property. In the end, the impact on these sectors' performance can also affect the financial sector, hotels and real estate as a source of financing for other sectors.

Nonetheless, based on this paper's findings, volatility increased significantly in the following period after the pandemic began, which is April 2020. CAR experienced a downward trend of almost 15%, with rising global uncertainty and increasingly negative global economic projections. This study found that on day 0, the announcement of the policy rate does not have a significant effect on the financial sector of the Indonesia Stock Exchange. The different result from this event study is that when the central bank announced an increase in policy rates when the COVID-19 pandemic was still occurring, it increased CAR in the event window (-10, 10).

V. CONCLUSION

Using the event study method, this paper examines the impact of monetary policy announcements in the form of the policy rate during the COVID-19 period on the financial sector's performance on the Indonesia Stock Exchange. Event study analysis is applied at the sectoral level to closing stock prices in the financial sector using a 120-day estimation window and a 10-day event window (-10, 10) for 31 policy rate announcements after the Indonesian government declared the conditions of the COVID-19 pandemic in April 2020. This study also tries to see how the effect of monetary policy announcements remains stable, decreases, and increases compared to the previous month. During the observation period from April 2020 to October 2022, there were three times an announcement of the policy rate increased, 24 times the policy rate, and four times the policy rate decreased. Furthermore, to test the significance of the announcement effect around the event window (-10, 10) of the AR, this study uses a t-test. We also calculate the CAR throughout the event window (-10, 10) to see the total effect of the policy rate announcement on the financial sector.

We found that all 31 policy rate announcements had no significant impact on announcement day or Day 0. When the declining policy rate announcement, during the event window, AR was significantly positively affected, especially on Days -6 and -8. Meanwhile, from the CAR side, there was also a positive upward trend; this was entirely in line with AR, which experienced a significant positive influence.

Furthermore, for the unchanged policy rate announcement, we find a significant negative effect on AR during the window period before the policy interest rate announcement. This study also found that negative effects could be seen after and before the policy announcement. During the COVID-19 pandemic period,

this study found that the AR of the financial sector responded significantly to monetary policy occurring in 2022. We see that CAR shows greater dynamics or unstable monetary policy announcements and tends to be in a negative trend.

Finally, when the announcement of an increase in the policy rate, this study finds that the impact on the AR of the financial sector is significantly positive during the event window (-10, 10) or in the short term. In addition, CAR dynamics in the financial sector were more stable when the central bank announced an increase in the policy rate. This indicates that the response of the financial sector to monetary policy, which increases policy rates, is better than the unchanged and declined policy rate.

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REFERENCES

Journal Papers:
[1]   A.C.MacKinlay, Event studies in economic and finance,*Journal of Economic Literature, 35,* 1997, 13–39.
[2]   F.Günayand E.Bayraktaroğlu, Analysis of the effects of the central bank's interest announcements on tourism index returns,*Sosyoekonomi, 30(51),* 2022, 91-118.
[3]   E.F. Fama, Efficient capital markets: a review of theory and empirical work,*The journal of finance,28-30*, 1970, 383-417.
[4]   W. Thorbecke, On stock market returns and monetary policy,*The journal of finance. 52,* 1997, 635-654.
[5]   R.Maran, Reaction of the Philippine stock market to domestic monetary policy surprises: an event study approach,*MPRA, 114855,*2022.
[6]   S. Zarei and Z.Honarmandi, Covid-19 outbreak and sectoral-level stock return in the Tehran stock exchange: an event study,*Iranian Journal of Management Studies, 15(4),* 2022, 835-849.
[7]   M.M.Alam, H. Wei, andA.N.M.Wahid, Covid-19 outbreak and sectoral performance of the Australian stock market: an event study analysis,*Australian Economic Papers*,e12215, 2020.
[8]   I.Zuhroh, the effectiveness of covid-19 policies on the volatility of stock in the banking sector,*Academy of Strategic Management Journal, 21(2),* 2022,1-12.
[9]   Y. Hsing, Effect of fiscal policy and monetary policy on the stock market in Poland, *Economies, 1,* 2013, 19-25.
[10]   Q. Wang and E.W.T. Ngai, Event study methodology in business research: a bibliometric analysis,*Industrial management & data systems, 120*, 2020, 1863-1900.
Books:
[11]   IMF, *World economic outlook: the great lockdown*(World Economic Outlook Report: IMF, 2020).
[12]   P.Warjiyo and J.Agung, *Transmission mechanism of monetary policy in Indonesia*(Directorate of Economic Research and Monetary Policy: Bank Indonesia, 2002).

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