The Dovish and Hawkish in the Black Swan Phenomenon: Case in Indonesia

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Abstract: Uncertain economic events tend to have an impact on investors' decisions in the capital market. Recently, global inflation has also influenced monetary policy in Indonesia, especially the decision to increase interest rates. The objective of this study is to examine the effect of interest rate on market returns in Indonesia over period 27 December 2021 to 31 March 2023. During 23 August 2022 to 31 March 2023 (or hawkish period), the findings show that, first, most of the sectors experienced insignificant decline in returns except the infrastructure sector. Second, rising interest rates tend to make most sectors more efficient except finance and the technology sectors. Third, estimated returns predict that maintaining a hawkish stance tends to lead to small increases in returns for most sectors except for a few sectors such as consumer non-cyclical, properties & real estate, and healthcare.

Keywords: Dovish; hawkish; interest rate; market return; sector index.
JEL Classification: G01; G11; G14; G18.

INTRODUCTION

The black swan phenomenon is a symptom of an event that cannot be predicted and has the potential for quite detrimental consequences or extreme impacts (Taleb, 2007). In the economic field, the black swan phenomenon tends to have a negative impact, especially on investment in the capital market (Bogle, 2008; Siegel, 2010). The use of forecasting models that are not precise in the black swan phenomenon results in failed predictions and increases the risk of investment security (DeLong & Magin, 2009; Zhang et al., 2022). Empirically, Aven (2013, 2015), and Stavrova et al. (2020) prove that the effect of the black swan incident has a negative impact on investment related to risk due to uncertainty.

Recently, the capital market in Indonesia tends to be faced with the possibility of the black swan phenomenon due to global issues related to economic events (such asthreat of the COVID-19 pandemic with its variants, energy crisis, food crisis, and global inflation). At this time, the Government of Indonesia is also actively evaluating and revising interest rates to anticipate the national inflation as it is experiencing an unstable condition and tends to move up since early 2022. However, the policy of setting interest rates in line with the black swan phenomenon is also indicated of having an unpredictable impact, especially in the capital market. Therefore, this study aims to examine the impact of interest rate policy on the performance of the capital market in Indonesia during uncertain economic events.

LITERATURE REVIEW

Black Swan and Interest Rate Implications

The black swan phenomenon was introduced for the first time by Taleb (2007) which is a symptom of an event that cannot be predicted and has the potential for quite detrimental consequences. Bogle (2008), Aven (2013), and Glette-Iversen and Aven (2021) characterize this phenomenon with extreme conditions, adverse effects, and extensive pressure from several parties when conditions occur. According to Aven (2013), the black swan phenomenon can explain risk from several points of view, which are: (1) expected consequences or expected utility; (2) the probability of an event; (3) uncertainty of purpose; (4) loss uncertainty; (5) the potential or possibility of loss; (6) probability and scenario/consequence/severity of another consequence; (7) events or consequences; (8) consequences/damage/severity and uncertainty; and (9) the effect of goal uncertainty. Therefore, Aven (2015) suggests that in order to anticipate the black swan phenomenon, it is necessary to adopt a risk-based approach that is resilient and adaptive.

Empirically, Ilalan (2016) and Chatzikonstanti and Karoglou (2022) prove that the black swan phenomenon tends to be synonymous with extraordinary economic events and quite influences the capital market. But, the findings of Yarovaya et al. (2021) imply that the black swan effect will not have a serious impact if the investors have sufficient information about market conditions. Stavrova et al. (2020), Nguyen et al. (2021), Phadnis et al. (2021), Zhang et al. (2022), and Umar et al. (2022) find that the COVID-19 pandemic, which is synonymous with the black swan phenomenon, tends to cause macroeconomic variables to have an impact (both positive and negative) on capital market trading. Lovisolo and Leal (2013) find that investors in Brazil tend to be more passive in dealing with the effects of the black swan phenomenon, especially in the period from January 1995 to March 2009. Similarly, Ahmad et al. (2021) also find that the black swan event provides limited opportunities for investors to invest, especially over the period of May 1, 2019, to March 31, 2020. Bhattacharjee and De (2022) prove that the black swan event gives quite a negative shock which resulted in increased volatility for the most of developed, emerging, and

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frontier markets along with the BRIC markets from January 2020 to October 2020. Das and Debnath (2022) find that the impact of COVID-19 as the black swan event had less impact on the capital market in India from September 2019 to July 2021 due to a lack of sensitivity to external shocks.

The interest rate is a macroeconomic policy that plays an important role in economic growth. The concept of dovish refers to the policy to reduce interest rates when inflation rates are in a stable position, while hawkish refers to the policy to increase the interest rates while inflation is high (Claeys, 2015; Tadle, 2022). In the case of ASEAN-5, Thanh (2015) suggests that the central bank needs to act quickly to reduce the inflation rate in terms to increase economic growth, for example through interest rate policy.

However, the policy to set interest rate increases tends to have an impact on investment activity in the capital market for all existing industrial sectors. The evidence from Moya-Martínez et al. (2015), Javangwe and Takawira (2022), and Bhattacharjee and Das (2023) show that the relationship between interest rates and stock investment is inversely proportional, which implies that if interest rates rise, investment tends to be sluggish. Deng et al. (2022) find that reducing interest rates during the COVID-19 period could have a positive effect on investment growth in the capital market. However, Eldomiaty et al. (2020) find that stable conditions in the period 1999 to 2016 for non-financial companies in the United States (particularly the DJIA30 and NASDAQ100) resulted in a significant positive relationship between interest rates and stock price movements. In China, Gu et al. (2022) prove that increases in interest rates during unfavorable economic conditions tend to be accompanied by an increase in national investment if there are abnormally profitable opportunities. But, the findings of Wong (2022) also imply that increases in interest rates tend to be accompanied by decreases in stock prices in the short term.

H1: The interest rate during black swan phenomenon reduces market returns

Efficient Market Hypothesis

The efficient market hypothesis (EMH) defines that stock prices immediately reflect all relevant information in real-time (Fama, 1970). Therefore, Fama (1970) emphasizes that investors obtain zero abnormal returns in efficient market conditions as the prices are unpredictable. Fama (1998) and Leković (2018) also suggest that EMH can be the basis for explaining all anomalous events. For example, Ngoc et al. (2021) prove that uncertain conditions due to the COVID-19 pandemic in Vietnam have resulted in investors obtaining various abnormal returns. Nageri and Abdulkadir (2019) also find that the Nigerian market condition is inefficient in weak form during the 2008 to 2009 financial crisis.

Other evidence, Borges (2010) finds that more efficient market conditions (such as Greece and Portugal) tend to be caused by more advanced economic growth. Bolek et al. (2022) find that the COVID-19 pandemic tends to change efficiency patterns in Scandinavian markets but conversely does not have a significant impact on Baltic markets. Rizvi and Arshad (2016) find that Indonesia tends to be in a more stable condition during the financial crises in 1997 and 2008 because it had a fairly good economic structure. Similarly, Elangovan et al. (2022) find that the Indian stock market is as weak-form inefficient during an era of good economic growth and rapid development of information technology. Heymans and Santana (2018) find that the Johannesburg Stock Exchange is in an efficient condition in the period 3 July 1997 to 3 March 2015, although during certain periods market conditions are more predictable so that portfolio management of the investors could perform well.

H2: The market returns become more efficient during the black swan phenomenon

RESEARCH METHOD

Data

This study uses sector indexes which is drawn from the Indonesia Stock Exchange and sort it as the time series data. The sector indexes consists of energy (IDXENERGY), basic materials (IDXBASIC), industrials (IDXINDUST), consumer non-cyclical (IDXNONCYC), consumer cyclical (IDXCYCLIC), healthcare (IDXHEALTH), finances (IDXFINANCE), properties & real estate (IDXPROPERT), technology (IDXTECHNO), infrastructures (IDXINFRA), and transportation & logistics (IDXTRANS). On those indexes, the market returns (MR) minus interest rates (RF) from Central Bank of Indonesia is used as the variables. The MR is measured as a difference of current and previous daily closing price divided by previous daily closing price.

Since 23 August 2022, the Central Bank of Indonesia has increased the interest rate from 3.50% to 3.75%. The interest rate has continued to increase to 5.75% since 19 January 2023 and still remains until 31 March 2023. Therefore, the observation period from this study is 27 December 2021 to 31 March 2023 with the following events: (1) 27 December 2021 to 22 August 2022 (156 days) or the dovish period; and (2) 23 August 2022 to 31 March 2023 (156 days) or the hawkish period.

Method of Analysis

The initial procedure to test the first hypothesis is to describe the returns (MR-RF) of each industrial sector in the dovish and hawkish periods through descriptive statistics and applying the mean difference test. The next procedure to test the second hypothesis is to apply a run test on MR-RF with the following formula.

$$z = \frac{U - \left(\sqrt{\frac{2.\eta_p.\eta_n}{\eta} + 1}\right)}{\sqrt{\frac{2.\eta_p.\eta_n\left(2.\eta_p.\eta_n - \eta\right)}{\eta^2.(\eta - 1)}}} \quad (1)$$

In the final stage, the study performs procedures to estimate MR-RF for the next 150 days. At this stage, an econometric model preceded to detect any unit root problem based on the Augmented Dickey-Fuller (ADF) test with the following formula.

$$\Delta y_t = \alpha + Y y_{t-1} + V_t \quad (2)$$

If there is a unit root problem, a differencing process for MR-RF is taken in the ADF test to meet the assumptions of stationary data using the following formula.

Table 1. Descriptive Statistics.

	Mean		Std. Deviation		Skewness		Kurtosis	
	Dovish	**Hawkish**	**Dovish**	**Hawkish**	**Dovish**	**Hawkish**	**Dovish**	**Hawkish**
IDXENERGY	0.0030	0.0010	0.016	0.015	0.318	-0.334	1.038	0.967
IDXBASIC	0.0003	-0.0006	0.013	0.009	-0.102	0.025	-0.160	0.368
IDXINDUST	0.0014	-0.0007	0.012	0.009	0.153	-0.043	0.795	1.255
IDXNONCYC	0.0004	0.0000	0.009	0.006	-0.083	0.555	1.758	1.139
IDXCYCLIC	-0.0001	-0.0006	0.010	0.007	0.429	-0.399	1.951	1.902
IDXHEALTH	-0.0001	0.0005	0.009	0.008	-0.159	0.103	0.616	0.900
IDXFINANCE	-0.0002	-0.0006	0.011	0.008	-0.613	0.324	1.703	0.000
IDXPROPERT	-0.0007	-0.0003	0.009	0.007	0.502	0.176	2.312	0.314
IDXTECHNO	-0.0004	-0.0027	0.022	0.016	0.051	0.498	0.075	0.884
IDXINFRA	0.0005	-0.0017	0.010	0.008	-0.142	-0.189	0.844	0.758
IDXTRANS	0.0015	-0.0008	0.019	0.012	0.370	0.240	0.862	1.101

$$\Delta y_t = \alpha + Y y_{t-1} + \sum_{s=1}^{m} a_s \Delta y_{t-s} + V_t \qquad (3)$$

If the stationary assumptions are met, an autoregressive integrated moving average (ARIMA) is applied with the following formula.

$$Yt = \alpha + \beta 1 Yt\text{-}1 + \theta 1 \varepsilon t{-}1 + \varepsilon t \qquad (4)$$

RESULT AND DISCUSSION

Table **1** shows that the mean ofMR-RF for most sectors experienced decline in the hawkish period except for the IDXHEALTH and IDXPROPERT. Consistent with Moya-Martínez et al. (2015), Javangwe and Takawira (2022), Wong (2022), and Bhattacharjee and Das (2023), those results indicate that an increase in interest rates tends to reduce investment interest by investors. These results also imply that hawkish policies tend to result in investors shifting their assets to more profitable risk-free investments. Even though the standard deviation shows that the market is becoming less volatile in hawkish period, the IDXHEALTH and IDXPROPERT tend to be favoredby investors.The increase in gross domestic product and the policy of easing mortgage loans which can trigger an increase in the life expectancy of the people are the most possibly reasons for the interest in those sectors.

Furthermore, the normality test is performed in terms to determine the mean difference test such as the t-test or non-parametric test. Table **2** presents the mean difference test for the mean of each sector in dovish period and hawkish period. The results of the mean difference test confirm that only the IDXINFRA has a significant difference in returns between both periods. This result indicates that the IDXINFRA experienced a significant decline in returns in the hawkish period. The possible cause of this condition is that there were a number of projects that were delayed during the pandemic, thus disrupting cash flow conditions. On those results, this study finds that increases for interest rates (hawkish policy) during the black swan phenomenon tend to reduce returns significantly thus the first hypothesis is accepted especially for the case of IDXINFRA.

The second procedure, this study performs tests to detect market efficiency during dovish and hawkish periods. Table **3** shows that the IDXINDUST, IDXNONCYC, and IDXTRANS during the dovish period are significant at 5% and 10% respectively. The findings indicate that the implementation of relatively low or stable interest rates during the black swan phenomenon has an inefficient impact on these sectors or in other words, is more predictable. During hawkish period, the runs test shows that IDXFINANCE and IDXTECHNO are significant at 10%. The results indicate that those sectors are inefficientas the monetary policy implements high interest rates during uncertainty under the tendency of the black swan phenomenon. Supporting the findings of Nageri and Abdulkadir (2019), and Ngoc et al. (2021), this study suspects that investors for thosesectors are mostly passive because of a number of outstanding global issues.

The findings also reveal that most sectors such as IDXENERGY, IDXBASIC, IDXCYCLIC, IDXHEALTH, IDXPROPERT, and IDXINFRA are consistently efficient during dovish and hawkish periods. Based on these results, the second hypothesis is accepted, including for sectors that have changed from inefficient to efficient. Consistent with Borges (2010), and Rizvi and Arshad (2016), the condition tends to indicate that there is good economic resilience in Indonesia so that the implemented interest rate policy does not affect these sectors. But, consistent with Fama (1970, 1998) and Leković (2018), the condition of these sectors is also possibly to be more influenced by the uncertainty caused by the black swan phenomenon (such as global issues) in perspective of EMH. Other interesting findings are that even though IDXHEALTH and IDXPROPERT are consistently efficient in dovish and hawkish periods but those sectors can produce better returns.

Table 2. Mean Difference Test.

	Mean		Normality Test		Difference Test
	Dovish	Hawkish	Dovish	Hawkish	
IDXENERGY	0.0030	0.0010	0.037	0.042	0.0020[a]
IDXBASIC	0.0003	-0.0006	0.032	0.058	0.0009[a]
IDXINDUST	0.0014	-0.0007	0.070[*]	0.054	0.0021[b]
IDXNONCYC	0.0004	0.0000	0.072[**]	0.043	0.0004[b]
IDXCYCLIC	-0.0001	-0.0006	0.082[**]	0.070[*]	0.0005[b]
IDXHEALTH	-0.0001	0.0005	0.074[**]	0.061	-0.0006[b]
IDXFINANCE	-0.0002	-0.0006	0.053	0.067[*]	0.0004[b]
IDXPROPERT	-0.0007	-0.0003	0.073[**]	0.053	-0.0004[b]
IDXTECHNO	-0.0004	-0.0027	0.047	0.061	0.0023[a]
IDXINFRA	0.0005	-0.0017	0.043	0.049	0.0022[a**]
IDXTRANS	0.0015	-0.0008	0.062	0.058	0.0023[a]

*, **, *** are significant at 10%, 5%, and 1%
[a]Based on t-test
[b]Based on Mann-Whitney test

Table 3. Runs Test.

Variable	N	Mean (K)	Number of Observations		Number of Runs		Sig.
			≤ K	> K	Observed	Expected	
Dovish							
IDXENERGY	156	0.0030	83	73	84	78.68	0.391
IDXBASIC	156	0.0003	78	78	74	79.00	0.422
IDXINDUST	156	0.0014	83	73	91	78.68	0.047
IDXNONCYC	156	0.0004	78	78	92	79.00	0.037
IDXCYCLIC	156	-0.0001	78	78	79	79.00	1.000
IDXHEALTH	156	-0.0001	83	73	83	78.68	0.486
IDXFINANCE	156	-0.0002	75	81	81	78.88	0.734
IDXPROPERT	156	-0.0007	82	74	86	78.79	0.246
IDXTECHNO	156	-0.0004	82	74	75	78.79	0.541
IDXINFRA	156	0.0005	78	78	74	79.00	0.422
IDXTRANS	156	0.0015	80	76	67	78.95	0.055
Hawkish							
IDXENERGY	156	0.0010	75	81	75	78.88	0.532
IDXBASIC	156	-0.0006	79	77	79	78.99	0.998
IDXINDUST	156	-0.0007	75	81	75	78.88	0.532
IDXNONCYC	156	0.0000	79	77	72	78.99	0.262
IDXCYCLIC	156	-0.0006	79	77	78	78.99	0.874
IDXHEALTH	156	0.0005	83	73	83	78.68	0.486

IDXFINANCE	156	-0.0006	83	73	89	78.68	0.096
IDXPROPERT	156	-0.0003	80	76	79	78.95	0.993
IDXTECHNO	156	-0.0027	80	76	68	78.95	0.078
IDXINFRA	156	-0.0017	80	76	80	78.95	0.866
IDXTRANS	156	-0.0008	81	75	71	78.88	0.205

Table 4. ADF Test and ARIMA.

Variable	t-statistics	ARIMA	AIC	BIC	Mean MR-RF			
					Dovish	Hawkish	Estimation at RF	
							5.75%	6.00%
IDXENERGY	-17.13648***	2,0,2	-1704.76	-1682.30	0.0030	0.0010	0.0019	0.0019
IDXBASIC	-17.69940***	2,0,2	-1903.28	-1880.82	0.0003	-0.0006	-0.0001	-0.0001
IDXINDUST	-18.20998***	2,0,2	-1955.49	-1933.03	0.0014	-0.0007	0.0003	0.0003
IDXNONCYC	-19.21858***	1,0,1	-2151.86	-2140.63	0.0004	0.0000	-0.0002	-0.0002
IDXCYCLIC	-15.56047***	3,0,2	-2086.86	-2060.66	-0.0001	-0.0006	-0.0004	-0.0004
IDXHEALTH	-19.62833***	0,0,1	-2064.16	-2052.93	-0.0001	0.0005	0.0002	0.0002
IDXFINANCE	-17.62488***	2,0,2	-2015.98	-1993.52	-0.0002	-0.0006	-0.0004	-0.0005
IDXPROPERT	-16.82669***	2,0,4	-2115.28	-2085.33	-0.0007	-0.0003	-0.0005	-0.0005
IDXTECHNO	-15.33825***	1,0,0	-1589.05	-1577.82	-0.0004	-0.0027	-0.0016	-0.0016
IDXINFRA	-17.23647***	1,0,1	-2057.51	-2042.54	0.0005	-0.0017	-0.0006	-0.0006
IDXTRANS	-16.07275***	4,0,2	-1694.00	-1664.06	0.0015	-0.0008	0.0003	0.0003

*** is significant at 1%.

The last procedure, the ADF test and ARIMA are performed in terms to provide estimated MR-RF for the next 150 days. The MR-RF is estimated based on two assumptions: first, the interest rate is constant at 5.75%; and second, the interest rate is increase at 6.00%. Table 4 shows that the t-statistics by ADF test for the returns of all sectors are stationary without differencing. As the data are stationary, this study then selects the ARIMA model based on Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC).The estimation based on ARIMA model shows similar results to the estimated MR-RF at the level of 5.75% and 6.00%. These results imply that if monetary policy remains in a hawkish stance then the impact on the capital market will vary.

The findings predict that the returns of IDXENERGY, IDXINDUST, and IDXTRANS tend to increase and change to be positive from the previous value which was negative. Similarly, increased returns also occurred in IDXBASIC, IDXCYCLIC, IDXFINANCE, IDXTECHNO, and IDXINFRA even though returns from those sectors remained negative. Conversely, IDXNONCYC and IDXPROPERT tend to experience a decrease in returns if the interest rate is constant or increased to 6.00%. In addition, IDXHEALTH is also predicted to experience a decrease in returns if it implements a hawkish policy even though changes in returns are still positive.

CONCLUSION

The black swan phenomenon can refer to uncertain circumstances, especially those related to economic events. Moreover, as the inflation tends to move up since 2022 then several options of fiscal and monetary policies perspective need to be implemented to maintain economic stability. One of the monetary policies in dealing with inflation conditions is to increase interest rates. Since 23 August 2022, the Central Bank of Indonesia has been actively evaluating and increasing interest rates up to 5.75% and remaining until 31 March 2023. However, the move from dovish stance to hawkish stance tends to have a certain impact on investment activity in the capital market.

There are three main implications of this study. First, hawkish policy tends not to have a significant impact on the returns of most sectors except for the infrastructure sector which has significant declining. Second, shifting from dovish to hawkish tends to make market conditions more efficient in most sectors except for the finance sector and the technology sector tends to become inefficient. Third, estimated returns predict that increase in interest rates tends to lead to small increase in returns even though the opposite impact occurs in several sectors such as consumer noncyclical, properties & real estate, and healthcare.

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