

Overreaction Behavior Analysis on IDX80 Stocks During Bearish Market Conditions (Study IDX During the Covid-19 Pandemic)

David Kaluge^{1,*}, Ajeng Kinesti²

^{1,2} Brawijaya University, Indonesia

*Corresponding author. Email: davidk@ub.ac.id

ABSTRACT

This study aims to identify the overreaction behavior indicated by the winner-loser anomaly. The overreaction behavior can be seen from the cumulative average residual return of the loser portfolio, which can outperform the winner portfolio with a significant value. The winner (loser) portfolio is selected with the highest cumulative abnormal return value (the lowest cumulative abnormal return value). Using market-adjusted return estimation, abnormal return is calculated by finding the difference between actual and market returns. The research found an overreaction behavior on the first day, which is supported by a reversal in each portfolio on the same day. Thus a strategy of contrarian can be applied with caution

Keywords: *Overreaction Behavior, Winner-Loser Anomaly, Contrarian Strategy, Abnormal Returns, IDX 80, Bearish Market, Covid-19.*

1. INTRODUCTION

Officially announced on March 2, 2020, by The Indonesian Government, the covid-19 has entered Indonesia and created a pandemic. This pandemic has not only become a health problem, but has also disturbed business activities, the economy and become an even more severe threat [1]. Baker in Huo and Qiu stated that the COVID-19 pandemic will significantly increase economic uncertainty [2].

As an important part of the economy, the stock market is also greatly affected [2]. This is because information about the impact of COVID-19 makes investors react, which is reflected in changes in stock prices in the market. It is supported some researchers [3, 4] who prove that increasing cases of COVID-19 will lead to high volatility in the equity market. In Indonesia, the Composite Stock Price Index (IHSG) has proven to be weak since the entry of Covid-19.

2. LITERATURE REVIEW

Although the capital market is filled with various rational analyzes to see the behavior of asset prices, Shiller [5] also proves that investors are not always rational because of the psychological influence of

investors related to their role in financial decision making.

In behavioral finance, investors act irrationally because cognitive and emotional biases affect them. Cognitive bias is a decision-making deviation from rigorous analysis, while emotional bias is a decision-making error because it ignores facts [6].

In recent times, the COVID-19 pandemic affects individuals' mental health just as much as financial markets [7]. They find that investor psychology shows a downward trend in the stock market as shown in China, Japan, and the United States stock markets due to investors who no longer behave rationally [7].

2.1. Overreaction Behavior

Hypothesis overreaction stated in essence that the market had overreacted towards the information. The hypothesis of overreaction suggests two patterns for the price of shares that can be predicted, namely: (1) the extreme movement of the stock price will be followed by further opposite direction movement of it and (2) the more the extreme of the initial price movement, the larger the subsequent adjustment [8]. In short, any information received by the investor to make the extreme movement of stock price will be followed

by extreme movement in the opposite direction in the next period bias [9, 10].

Overreaction is a reaction for setting prices too high for good information and too low for information that is considered bad. It can happen because in receiving information, investors give too much weight to the current information and give less weight to long-term fundamentals [11].

The impact of the overreaction is that the stock price will change to an extreme and no longer reflect its intrinsic price. The consequence of their overreaction is that the investor can earn abnormal returns. Then, once they realize that the reaction has been excessive, they will start correcting the reaction following the actual situation. It is what makes the stock price will return to its fair price. The existence of a correction or change in the reaction is referred to as a reversal phenomenon, where De Bondt and Thaler popularized this phenomenon as a winner-loser anomaly [12].

The winner-loser anomaly is one of the anomalies in the capital market. This anomaly can also be referred to as the reversal effect. This phenomenon is caused by overreaction hypothesis [12]. It found that stocks that were initially providing a high level of profit (winners) or large lost (losers) will experience a reversal in later periods [13]. Different from the expected that high profit stock should be profitable, and the loser still is the loser.

2.2. Contrarian Strategy

Contrarian strategy is an investment style in which investors go against current market trends by selling securities when the others buy and buying when most large investors sell [14]. Contrarian investors are individuals who act against market sentiment. The basic idea of this strategy is that the market follows the herding behavior and is boosted by a sense of fear and greed. It would make the market is periodically too expensive or too cheap.

When the information is perceived as negative, the market/share value will be below its intrinsic value. Pessimism of investors pushes stock prices to be far below their fair value. In such conditions, the contrarian investors would buy the stock before the sentiment widespread into the whole market and before the stock price experienced a rebound. Contrarian investors look for opportunities to buy in bearish markets and sell in bullish markets.

This strategy suggests buying loser stocks in the past and selling those stocks after being winners in the future. Chen stated that the way to get a profit by implementing a contrarian strategy when overreaction is to buy a security that has performed as the loser in the past and to sell the security that performs as the winner [14]. It is because, in a long period, the loser stocks will provide profit that exceeds the profit of the winner stocks. In addition, this results in a negative correlation between the winner and loser securities. The loser will be the winner and the winner will be the loser, so the sale of the loser securities will earn positive abnormal returns.

2.3. Covid-19 pandemic as a bearish market

The impact of this pandemic increases economic uncertainty significantly [2]. Some policies and appeals were made to minimize the spread of covid-19 would hamper economic activity in each country. Wren and Lewis claim that the COVID-19 pandemic has had a significant impact on Gross Domestic Product (GDP) due to a decline in production and changes in consumer demand [1]. In Indonesia, the growth of the economy experienced a decline since Q4 2019 (4.97% YoY) followed by a decline that is steeper in Q1 and Q2 of 2020, which became 2.97% and -5.32% YoY. At the same time, the stock market, as an important part of the economy has also the same impact. Khan et al. [1] prove that increasing cases of COVID-19 will reduce stock market returns. In Indonesia, from the beginning of the year to Q1 2020, the Index Price Stock Composite (JCI) experienced a decline in the extreme. The first quarter of 2020 decreased by -23.59% YTD, followed by a correction in Q2-Q4 2020, which was -17.42%, -18.01%, and 0.66% YTD. Extreme stock movements and declining economic growth cause investors to live in an uncertain situation. They are worried about uncertain conditions, thus making investors behave irrationally and do overreact. This is supported by several researchers that overreaction usually occurs in response to bad situations [15] [16]. The bad situation in this context can be reflected in the declining trend of the stock market and slowing economic growth. This such a market condition is said to be a bearish market.

3. RESEARCH APPROACH

This study uses data from the Indonesia Stock Exchange (IDX) for the period December 2019 – April 2021. The data used are stocks included in the IDX80

Index. IDX80 represents 80%-90% of the stock market, so IDX 80 is believed to reflect stock movements in the market.

The sample provisions in this study are as follows: 1). A top 10% Stocks based on the value of the cumulative abnormal return (CU_j) of shares of companies in IDX80 in each replication period for each set of observations. 2). A bottom 10% Stocks base on the value of the cumulative abnormal return (CU_j) of shares of companies in IDX80 in each replication period for each set of observations.

By using purposive sampling, this study takes a sample of 7 stocks for each winner and loser portfolio from a total of 64 stocks that are consistently listed in the IDX80 index.

3.1 Method

Research methods and procedures were adapted from the research of De Bondt and Thaler. The procedure includes the calculating daily return of individual stocks, return market, Abnormal Return (U_j), with a model of market adjusted abnormal return, and seeking Cumulative Abnormal Return (CU_j) of each stock winner and loser. The value CU_j is used to sort the stocks from the highest to the lowest value then which will be used to classify stocks into a portfolio of the winner and the loser. Portfolio classified into winners consisting of 10% of the stocks from the highest value of CU_j and portfolio loser consists of 10% of the stocks from the lowest value of CU_j . The next data processing stage is to find the value of Cumulative Average Residual Return (CAR) and the Average Cumulative Average Residual Return (ACAR) on each winner and loser portfolio for each testing period.

This study observed three sets of tests: 21-day, 10-day, and 5-day testing. For the 21-day test, the period used is from December 2, 2019 - 21 April 2021 because during this period, a bearish market began to occur until the longest bearish period (there are data limitations). Meanwhile, for the 10-day testing period, this study uses an analysis period of 2 December 2019- 29 March 2021 because this period is a bearish start to one year of the COVID-19 pandemic in Indonesia. For the 5- day test, this study uses a shorter analysis period, namely: January 2, 2020 - October 2, 2020, because that period is a short-term bearish period that is accompanied by a decline in economic growth and an extreme decline in market prices.

There are three hypotheses to test; the existence of winners' reversals (H1), the existence of Losers' reversal (H2), and the existence of overreaction (H3).

3.1.1 Stage of Analysis

This study examines two portfolios, namely the winner and loser portfolios. The winner portfolio is comprised of a top 10% stock from the highest Cumulative Abnormal Return (CU) and the loser portfolio is a bottom 10% of stock based on the value of CU. For this purpose, the following steps are taken:

The actual return used in this study is the individual company stock return (j) included in the IDX80. To calculate the return, researchers follow the formula as:

$$R_{jt} = \frac{P_{jt} - P_{jt-1}}{P_{jt-1}} \quad (1)$$

Market Return in this study derived from the index IDX80 with the formula:

$$RM_{IDX80,t} = \frac{I_{IDX80,t} - I_{IDX80,t-1}}{I_{IDX80,t-1}} \quad (2)$$

Abnormal returns are calculated using the expected return of the use of the estimated market-adjusted model. Notation abnormal return is written into U_j , so as not to confuse on next step. The abnormal return formula is written as follows:

$$U_{jt} = R_{jt} - R_{IDX80,t} \quad (3)$$

Calculating of Cumulative Abnormal Return uses formula :

$$CU_{jt} = \sum_{t=-t}^{t=0} U_{jt} \quad (4)$$

Next is to classify the stocks for the winner and loser in every replication period as mentioned above.

There are some procedures to do in the Observation Stage; First is the Calculating the Average Residual Return. After the formation of the winner(+) and loser(-) portfolios, stock data including winners and losers will be calculated on average for each time t (daily/monthly/annual). AR_t referred to as the average of abnormal returns of samples in each portfolio (residual returns) and will be calculated for the test period. J indicates the number of shares included in the sample for the notation. Here's the formula AR for the sub-sample Winner (+) and Losser (-) :

$$AR_t^+ = \frac{\sum_{j=1}^{J^+} U_{jt}}{J^+}; \tag{5a}$$

$$AR_t^- = \frac{\sum_{j=1}^{J^-} U_{jt}}{J^-} \tag{5b}$$

The second is the calculating of Cumulative Average Residual Return. Based on the serial Average Residual Return (AR), its accumulation can be calculated for the winner and loser portfolios. The formula of Cumulative Average Residual Return (CAR):

$$CAR_t^+ = \sum_{i=1}^T AR_i^+; CAR_t^- = \sum_{i=1}^T AR_i^- \tag{6}$$

The third is the calculating of the Average of Cumulative Average Residual Return. Average Cumulative Average Residual Return (ACAR) is referred to as the average

CAR_t of each portfolio. The formula shows the number of replications in each portfolio for the N notation. The following formula is used:

$$ACAR_t^+ = \frac{\sum_{i=1}^T CAR_i^+}{N^+}; ACAR_t^- = \frac{\sum_{i=1}^T CAR_i^-}{N^-} \tag{7}$$

The fourth is the calculating of the Difference of ACARs. To calculate the difference between the ACAR of the loser and the winner portfolios. The difference between loser and winner is calculated to see if the loser's portfolio outperforms the winner. Here's a formula that can be used to calculate the difference ACAR loser and winner :

$$ACAR_t^- - ACAR_t^+ = \Delta ACAR_t \tag{8}$$

The fifth is the calculating t-statistics to test the significance of the hypothesis. The value of t-statistic is calculated to test the symptoms of reversal is the basis for concluding if the overreaction is significant. The T formula :

$$T_t = \frac{(ACAR_t^- - ACAR_t^+)}{\sqrt{\frac{2S_t^2}{N}}} = \frac{\Delta ACAR_t}{\sqrt{\frac{2S_t^2}{N}}} \tag{9}$$

Where T_t is the t-stat the difference between the loser-winner portfolio at time t

$ACAR^-$ is the average cumulative average residual return of the loser portfolio at time t

$ACAR^+$ is the average cumulative average residual return portfolios winner at time t

S_t^2 is the variance of the winner and loser portfolio at time t

For values of S_t^2 is calculated by the formula[12]:

$$S_t^2 = \frac{\sum(CAR_{N,t}^+ - ACAR_t^+)^2 - \sum(CAR_{N,t}^- - ACAR_t^-)^2}{2(N-1)} \tag{10}$$

Where, S_t^2 is the variance of the difference between the winner and loser portfolio at time t, $CAR_{N,t}^+$ is the CAR portfolios of the winner on replication n at time t, $CAR_{N,t}^-$ is the CAR portfolio loser on the replication n at time t, $ACAR_t^+$ is the ACAR portfolios of the winner at time t, $ACAR_t^-$ is the ACAR portfolio loser at time t, and N is the number of replications

The last is to draw conclusions based on test parameters. The conclusion of this research is based on the value of t-statistics. Testing for each hypothesis is as follows: $H1: ACAR_t^+ < 0$ (Null Hypothesis: No reversal in the winner); $H2: ACAR_t^- > 0$ (Null Hypothesis: No reversal in the loser); $H3: ACAR_t^- - ACAR_t^+ > 0$ (Null Hypothesis: No Overreaction)

4. FINDINGS

Based on a sort of computation and statistical tests, some points on overreaction can be emphasized as follows:

The first test result, which is 21-day observation for 15 replications, is not consistent with the overreaction hypothesis. In the first test, the ACAR loser-winner value does have a value greater than zero (except the 18th and 19th days), but statistically, the reversal is not significant. This can be seen from the t-statistic value, which has a value of less than t table with a significance level of 1%, 5%, and 10%, so H3 rejected.

The results of the second test were 10-day observation for 31 replications. The second test is inconsistent with the overreaction hypothesis. In the rule value, ACAR loser-winner indeed has a more substantial value than zero (except for the first and second), but it is statistically insignificant. This can be seen from the value of t-statistics which has a < t table with a significance level of 1%, 5%, and 10%, so H3 is rejected.

The results of the third test, namely the 5-day observation for 36 replications (see table 1). The third observer is consistent with the overreaction hypothesis. In the rule, the whole day's value has a more substantial value than zero, but it is statistically significant just happened on the day the first and second. It is evident from the t-statistic value that has a value > t table at a significance level of 5% and 10%, so *H3* accepted.

The winner's portfolio value experienced a significant reversal on the first and fifth days. For the first day, winner got -0.46% (t-stat: -1.69) significant at significance level 5% and 10%. Meanwhile, they will get -0.84% (t-stat: -1.740) for the fifth day at the significance levels 5% and 10% (see table 2). Unlike the winner portfolio, the loser portfolio experienced a reversal only on the first day, namely 0.53% (1.67) at a significance level of 10% (see table 3).

The statement of Piccoli, Chaudhury, and Souza regarding the overreaction period [17], is proven in this study, namely that the overreaction will be seen in a period of fewer than 21 days, wherein this study the overreaction occurred in the 5-day observation period with 36 replications during the bearish period. Other research [16] on overreaction in bearish market conditions occurs in line with this study. This study also supports [18], which proves an overreaction phenomenon on the Indonesia Stock Exchange but is not significant.

Thus, the overreaction during a bearish market due to the covid-19 pandemic was approved.

Some policies were considered to bring a positive influence on the reaction of investors applied in the market. August 2020, the issuer's performance report was released in the second quarter, before the second quarter of national growth, and after the announcement of the PSBB (Large-Scale Social Restrictions) policy [19]. Overreacting investors increasingly subsided with the test of clinical vaccine covid-19. the increase in the stock index was significant after the test of the clinical Sinovac vaccine in Indonesia.

Table 1. Testing for Overreaction

Replication	15		
	Replication		
	5		
	Daily		
Number of Formation Shares	7		
Pickles at the end	Winner	0.1125	t-stat

period			
formation	Loser	-0.0953	
Difference ACAR Loser- Winner (t-statistics)	Day 1st	0.0100	2,371
	Day 2nd	0.0134	2,062
	Day 3rd	0.0096	1,194
	Day 4th	0.0061	0.738
	Day 5th	0.0082	0.842
	Day 6 th		
		
	Day 21st		

Table 2. Testing for Winner Reversal

Replication	36		
	Replication		
	5 Daily		
Number of Formation Shares	7		t-stat
ACAR Winner at the end of the formation period	0.1125		
	Day 1st	-0.0046	-1,693
	Day 2nd	-0.0062	-0.743
	Day 3rd	-0.0055	0.382
	Day 4th	-0.0050	0.218
	Day 5th	-0.0084	-1,740
	Day 6th		
	...		
	Day 21st		

Table 3. Testing for Loser Reversal

Replication	36		
	Replication		
	5 Daily		
Number of Formation Shares	7		t-stat
Pickle Loser at the end of the formation period	-0.0953		
	Day 1st	0.0053	1,671
	Day 2nd	0.0073	0.502
	Day 3rd	0.0042	-1,285
	Day 4th	0.0011	-1.539
	Day 5th	-0.0002	-0.482
	Day 6th		
		
	Day 21st		

5. CONCLUSION

After analyzing and discussing the study results, following several conclusions were obtained from the research. 1) The cumulative average residual return (*ACAR*) of the winner portfolio has a negative value difference / smaller than zero on 5 days of observation so that the winner portfolio obtains a significant negative return on the first day. Thus, the winner portfolio is proven to have experienced a reversal as one of the conditions for overreaction. 2) The cumulative average residual return (*ACAR*) of the loser's portfolio has a positive value difference / greater than zero for the 5- day observation so that the loser's portfolio obtains a significant positive return on the first day. Thus, the loser's portfolio is proven to have experienced a reversal as one of the conditions for the occurrence of overreaction. 3) The cumulative average abnormal return (*ACAR*) of the difference between loser and winner portfolios has a positive value difference / greater than zero for 5 days of observation. The loser and winner difference portfolios get a significant positive return on the first day. It indicates that the loser's portfolio can outperform the winner. Thus, it can be concluded that there was an overreaction behavior in the Indonesian capital market when the bearish market, which was reflected in the winner and loser portfolio of the IDX80 stock index, experienced a significant reversal. 4) The occurrence of a significant overreaction indicates that the stock market in Indonesia is efficient in a weak form.

5.1. Implication

The winner's portfolio has proven to have a significant reversal. It's resulted in investors who buy shares of the previous winner will earn abnormal returns that are negative (investors obtain damages). Meanwhile, the loser's portfolio which is proven to have experienced a significant and significant reversal reflects that investors who bought the previous loser's shares will get a positive abnormal return (investors earn profits). Therefore, it can be concluded that the overreaction in the stock IDX80 makes investors who buy stocks loser will earn profits exceed investors who buy stock winner earlier. The research results can be used as input for the investor / other market participants to use the contrarian strategy when the markets are bearish, ie buying shares when the loser and selling when becoming a winner.

5.2. Suggestion

After knowing the conclusion, some suggestions can be given related to the research. 1) Investors are advised not to adopt a contrarian strategy. However, if investors want to implement a contrarian strategy, they are encouraged to be careful and actively seek information related to the securities they own. This advice was given because the overreaction behavior was only proven on one day when conditions were bearish during the covid-19 pandemic. 2) In researching overreaction, researchers further suggested extending the observation period, so research can potentially identify the behavior of overreaction. 3) Further research is recommended to use a sample of securities on other indices other than IDX80. This is because IDX80 is an index with a large capitalization, so the company can convince investors with its intrinsic value and make investors' reactions not excessive.

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