

COMPARATIVE ANALYSIS OF MARKET OVERREACTION IN INDONESIA AND SINGAPORE STOCK EXCHANGE 2016-2019

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Abstract *This study aims to determine whether there is a market overreaction phenomenon in the Indonesia Stock Exchange, which is classified as an emerging market, and the Singapore Stock Exchange, which is classified as a developed market. This research was conducted in a weekly period during 2016-2019. This study uses a sample included in the LQ-45 index for the Indonesia Stock Exchange and the top 30 market cap for the Singapore Stock Exchange. This research found a market overreaction in the Indonesia Stock Exchange, especially the loser portfolio, which experienced the most robust reversal. Meanwhile, the significant value in the one-sample t-test for the average cumulative abnormal return difference value is not significant. While the results of research on the Singapore Stock Exchange found no market overreaction phenomenon as indicated by a negative and insignificance average cumulative abnormal return difference. The result showed that the Indonesia Stock Exchange has not been efficient. Investors tend to overreact in responding to information. In contrast, investors on the Singapore Stock Exchange are rational.*

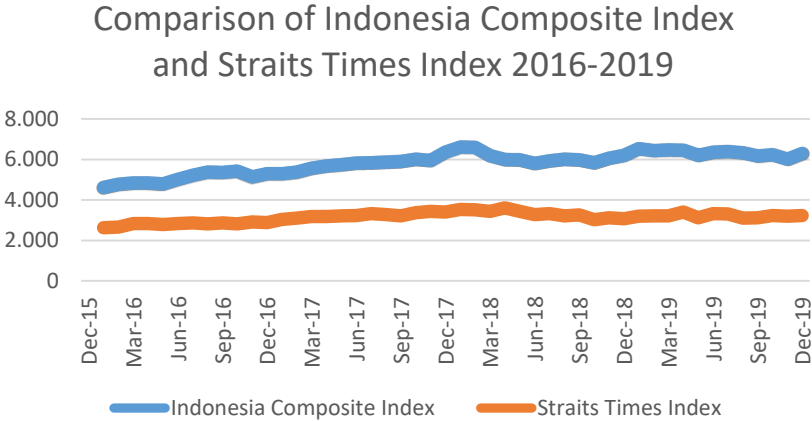
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Introduction

Currently, companies can increase business capital not only through banking. A capital market provides an opportunity for companies to get additional funds to develop their business. The capital market is a forum for those with excess funds (investors) and those who receive funds (issuers). On the other hand, the capital market is also a forum for investors to return on their invested number. Not only returns but investors are also faced with several risks—the greater the benefits, the greater the risk that they must be willing to bear.

Based on the Morgan Stanley Capital International All Country World Index, the MSCI ACWI Index formed by MSCI (Morgan Stanley Capital International), an independent global financial market analyst institution. The MSCI ACWI Index represents the full opportunity set of large-and mid-cap stocks across 23 developed and 27 emerging markets. This index groups stock exchanges in various countries into two indices, namely the MSCI World Index and the MSCI Emerging Markets Index. The MSCI World Index consists of stock exchanges that are classified as developed markets. Based on this index, Singapore's state-owned stock exchange is the only country in the Southeast Asia region included in the MSCI World Index. Meanwhile, stock exchanges in Southeast Asia, such as Thailand, the Philippines, Malaysia, and Indonesia, are included in the MSCI Emerging Markets Index, an index for stock exchanges classified as emerging markets.

Before deciding to invest their funds, investors must look at the company's fundamental and technical conditions and the issues currently in circulation. Analyzing activities like this are commonplace and must be done by investors before deciding to invest. Of course, this activity is also carried out by investors in Singapore. The difference in decisions made by investors will be reflected in the price of shares formed as a result of buying and selling by investors on the stock market. This difference in the decision also indicates differences in behavior between investors in investing, as seen in the figure below.



Source: www.investing.com.

Figure 1. Comparison of Indonesia and Singapore Stock Indices

Based on Figure 1, it can be seen that the Indonesia Composite Index chart tends to fluctuate and move at three thousand to six thousand throughout 2016-2019. The Indonesia

Composite Index is one of the stock market indices used by the Indonesia Stock Exchange to indicate stock movements. At the same time, the Straits Times Index chart tends to be stable and move at the price of two thousand and three thousand throughout 2016-2019. The Straits Times Index is a capitalization-weighted stock market index regarded as the benchmark index for the Singapore Stock Exchange. The different movements shown by the Indonesian and Singapore stock markets indicate different behavior by Indonesian and Singaporean investors when investing.

Although the analysis activities as above can explain and help investors invest, there are differences in responding to information that causes investment decisions. Bondt & Thaler (1985) found excessive reaction in addressing information such as selling shares when the stock price moves beyond expectations or buying stocks that have recently experienced profits without paying attention to fundamental analysis. Then, investors must also have several relevant information before making a decision. Relevant information will be available when the market is efficient (Fama, 1970).

Differences in attitudes when responding to information such as overreacting by investors are contrary to the statements described in the theory of market efficiency (Efficient Market Hypothesis), where the market is said to be efficient if the market reacts quickly and accurately to reach a new equilibrium price that reflects the available information (Jogiyanto, 2010). The Efficient Market Hypothesis, popularized by Fama (1970), is a fundamental theory that explains how the price of an asset is formed due to the entry of new information that is responded to by investors. According to this theory, investors are assumed to be rational beings who, in making decisions, are always based on rational expectations so that the price formed reflects current information. This theory also explains that price changes occur randomly and can not be predicted. Investors can not use past information or data to predict future prices to obtain abnormal returns.

A theory can explain how investors respond to information, namely the Market Overreaction Hypothesis proposed by De Bondt & Thaler (1985). According to this theory, winner and loser stocks tend to experience reversals over time due to excessive investor reactions to good news and bad news (Bondt & Thaler, 1985). In their research, De Bondt & Thaler use stocks that experience extreme gains and losses using monthly return data on the New York Stock Exchange (NYSE). In other words, stocks that experience extreme gains are called winner portfolios. Stocks that experience extreme losses are called loser portfolios formed based on past returns. The overreaction hypothesis can be seen if $t > 0$,

$ACAR_{w,t} < 0$ and $ACAR_{L,t} > 0$, so it can be concluded that $[ACAR_{L,t} - ACAR_{w,t}] > 0$ or if the difference between ACAR loser and ACAR winner is large than zero.

In addition, this theory also concludes that the abnormal returns generated by both winner and loser portfolios are due to excessive investor reactions. Alternatively, in other words, stocks that initially produce positive extreme abnormal returns (winner) or negative extreme abnormal returns (loser) will experience a reversal, especially loser stocks that outperform winner stocks. This condition will result in low stock returns that were previously high, and returns that were previously low will be high. As a result, stocks usually in demand by the market with high returns will become less desirable. On the other hand, stocks that are low value and less attractive will begin to be sought after by the market. This contradicts the concept of an efficient market that investors will not get an abnormal return if the market is efficient. The overreaction hypothesis explains that the market tends to overreact to information, especially dramatic new information. The market tends to overcharge stock prices in reaction to the news that is considered good. Instead, they will give too low prices as a reaction to the news that is considered bad. This phenomenon becomes reversed when the market realizes that it has overreacted to information. This reversal is indicated by the drastic decline in previously predicated stocks on the winner and the increase in previously predicated stocks on the loser (Bondt & Thaler, 1985). The existence of this anomaly has popularized the contrarian investment strategy, namely selling stocks when the market is up (winners) and buying shares in the market has decreased (loser) (Dissanaike, 1997).

According to Darusman (2012), investors can use two investment strategies to get returns: the contrarian and momentum strategies. Contrarian strategy against the flow: investors buy stocks that have decreased (loser) and sell them when they turn into winners or experience increases. Meanwhile, the momentum strategy is to buy shares when the stock price or index moves up in the hope of selling the shares when the stock price is higher than the purchase price during a specific period. Research by Chang et al. (1995) suggests that contrarian strategies can be used in the short term. The abnormal return occurs in the 5th month after the formation period on the Japanese stock exchange. Manurung (in Maharani & Witiastuti, 2015) explains that, in theory, the contrarian strategy is very appropriate to use for six months and one year. Thus, if the Indonesian market experiences an overreaction, a contrarian strategy can be used by investors to obtain a higher return

Several previous studies were conducted to examine return reversals caused by excessive market reactions using the winner and loser portfolios popularized by Bondt &

Thaler (1985), where the loser portfolio significantly outperformed the winner portfolio up to five years after the formation period on the New York Stock Exchange. However, from several previous studies that discuss market overreaction analysis in various countries, there are differences of opinion on whether or not there is a market overreaction in the stock market of a country classified as an emerging and developed market.

Research on market overreaction in emerging markets by Ali et al. (2012) found strong evidence supporting the overreaction hypothesis in the Malaysian stock market. The same result was also found in the Pakistan stock exchange conducted by Rehman and Said (2019), which found that investors had excessive reactions when responding to information. In addition, research on market overreaction on stock exchanges classified as emerging markets was also conducted by Reddy et al. (2020) tested the Shanghai Stock Exchange (SSE) in China 2009-2015. Still, with the same results, research examining market overreaction conducted by Lerskullawat & Ungphakorn (2019) on the Thai Stock Exchange 1990-2016 showed an overreaction. Research by Han et al. (2015) suggests that market overreaction is more often observed in the stock market, classified as an emerging market than in developed markets.

On the other hand, the overreaction event is also observed in already efficient markets, in this case, the developed markets. Baytas and Cakici (1999) examined the overreaction of seven countries with exchanges classified as developed markets, namely the United States, Canada, Japan, France, Italy, Germany, and the United Kingdom, in 1982-1991. Their research found strong overreactions over a two and three-year period for all countries except the United States and Canada. This study is in line with earlier research conducted by Chang et al. (1995) and Dissanaike (1997) found an abnormal return using a short-term contrarian strategy on the Japanese and London stock markets. Mazouz and Li's research (2007) tested overreaction on the London Stock Exchange 1973-2002 using a monthly period. They found an overreaction where The return of the loser portfolio outperformed the return of the winner's portfolio by about 16.4%. Market overreaction research is still found in markets classified as developed markets, namely the New Zealand stock market conducted by Bowman and Iverson (1998) in 1967-1986 using a weekly period. The findings indicate that there is an overreaction, especially for the loser portfolio in the short term.

Contrary to the results of the study by Baytas and Cakici (1999), the study conducted by Piccoli et al. (2017) in the United States market who examined 663 events (310 positives and 353 negatives) and found strong evidence of statistically and economically significant

support for the Market Overreaction Hypothesis. Similar results were also found in Mun et al. (2000) research, examining the contrarian strategy due to the overreaction popularized by De Bondt & Thaler using a non-parametric methodology with a multifactor asset pricing model in the US and Canadian stock markets. The risk-adjusted, non-parametric, multifactor bootstrap forecast results suggest that the short and medium-term contrarian strategies yield significant returns for the US market. For the Canadian market, the short to medium term contrarian strategy yields better returns

In contrast to previous studies showing that contrarian strategies can be applied to several countries classified as developed markets, research on the Singapore stock market shows different results. Ali (2020) found positive return momentum in the short term and no reversal in the long term. The absence of a reversal or reversal in the Singapore market indicates no overreaction or underreaction.

Meanwhile, research on market overreaction on the Indonesia Stock Exchange shows mixed results. Heryana (2017) tested market overreaction on stocks included in the LQ-45 index for 2011-2013 and found a reversal or reversal in loser group stocks. This reversal occurred in October 2011, February 2012, and December 2012. Hadioetomo and Sukarno (2009) researched manufacturing companies listed on the Indonesia Stock Exchange in 2006-2007. The result indicates an overreaction, indicated by the loser portfolio outperforming the winner's portfolio in the semester. In line with Hadioetomo and Sukarno (2009), Murtini and Widyatmadja (2011) obtained the same results, which showed overreactions in 80 manufacturing companies in 2004-2008 using daily stock price data. In addition, the research by Valentina et al. (2017) shows that overreaction occurs in the quarterly period and does not occur in the semester. This study uses the company's daily stock price data on the Bisnis-27 index for January 2015 - December 2016. The same results also occur in Said et al. (2018) research, which shows that there is an overreaction in all sectoral indices on the Indonesia Stock Exchange using weekly stock price data.

However, different results are shown in Hadimas (2019), who shows no overreaction in the semester and annual observation periods using the monthly return of stocks included in the LQ-45 index on the Indonesia Stock Exchange. This study also concludes that investors cannot use a contrarian strategy because price reversals only occur in a few months of observation. As a whole, there is no evidence of overreaction. Pratama et al. (2016), who tested overreaction in manufacturing companies in 2014, showed no overreaction. This is indicated by the significant abnormal return of winner stocks compared

to the abnormal return of loser stocks. The same results were also found in Pasaribu (2011), which showed no overreaction to the LQ-45 index 2003-2007 during the quarterly, semester, and yearly observation periods. In addition, Dewanthi and Wiksuana (2017) show that there is no statistically significant overreaction in companies listed in the Business-27 Index throughout 2016, which is characterized by consistently greater abnormal returns on winner stocks compared to loser stock abnormal returns. The same thing also happened in Widiastuti and Jaryono's (2011) research, which proved that there were no winner-loser anomalies and market overreaction, namely the absence of a symmetrical reversal effect, the performance of loser stocks was not able to outperform winner stocks. One stock did not give abnormalities significant returns both before and after adjusting for size and risk. This study uses shares of property and real estate companies listed on the Indonesia Stock Exchange in 2004-2008 using monthly data

Unilever Indonesia Tbk is one of the companies included in the LQ-45 index. Quoted from the CNBC Indonesia news page, the unsatisfactory disclosure of financial statements was responded to by a decline in share prices in the capital market. The company's net margin in the 3rd quarter fell to 17.03% from the previous 23.1%. As a result of the disclosure of the information, the investor released the company's shares which resulted in the share price dropping to Rp44,750 from the previous Rp45,600. This phenomenon illustrates that the market tends to set a low stock price on news that is considered bad.

So based on the description above, researchers are interested in researching by analyzing market overreaction events on the Indonesian and Singapore Stock Exchanges in 2016-2019 to compare whether or not there are market overreaction events in emerging markets, in this case, Indonesia and markets that are classified as a developed market, in this case, is Singapore. This study uses weekly stock data to see the significance of changes or movements in stock prices. The selection of this weekly observation period looks at the results of previous studies, namely Ali et al. (2012), where overreaction occurs in one to four weeks on the Malaysian stock exchange and the research results of Chang et al. (1995). They showed that abnormal returns could be obtained in the short term.

LITERATURE REVIEW

Behavioral Finance

Behavioral finance has a close relationship with investor psychology and plays a role in making investment decisions. This theory diminishes the rationality assumptions found in financial theory in general. It explains the natural behavior of investors influenced by psychology and emotions that can lead to bias. Research in the field of behavioral finance develops over time. Researchers tried to explore the effect of behavioral bias and heuristics on the return of securities for investors in the stock market. The markets have grown complex and more significant with many investors in them. So, if you only use intuition in making decisions, it will result in mistakes and losses (2015).

Financial behavior began to be recognized by various parties, especially academics, after Slovic (1969,1972) put forward the psychological aspects of investors and stockbrokers. Nofsinger (2001) defines financial behavior, namely studying how humans behave in a financial setting. In particular, study how psychology affects financial, corporate, and financial market decisions. This concept clearly states that financial behavior is an approach that explains how humans make decisions in investing or dealing with finance influenced by psychological factors.

Capital Market Efficiency Theory

Market efficiency or efficient market is a market where the prices of all traded securities reflect all available information (2010). The sooner new information is reflected in securities' prices, the more efficient the capital market will be. Thus, it will be challenging for investors to consistently obtain above-average profit levels by trading on the stock exchange.

Fama (1970) divides three forms of the efficient market with information parameters, namely:

1. Weak Form Market Efficiency

A weak form efficient market is a market in which the price of a security fully reflects past information. This means that all information in the past will be reflected in prices that are formed now. Therefore, historical information such as prices and trading volume in the past can no longer predict future price changes because they are already reflected in current prices. The implication is that investors will not predict the future stock market value to get an abnormal return.

2. Semi Strong Form Market Efficiency

The market is said to be in a semi-strong state if the prices of securities fully reflect all published information, including reports contained in the issuing company's financial statements. Suppose the market is in an efficient, semi-strong form. In that case, no investor or group of investors can use the published information to get abnormal returns over a long period.

3. Strong Form Market Efficiency

A strong form of an efficient market is where the security price reflects all published information, including private information. In this form of strong efficiency, not a single investor will get an abnormal return.

Market Overreaction Hypothesis

The market overreaction hypothesis states that the market has overreacted to specific information. Market players tend to overcharge information that is deemed reasonable and overcharge information that is considered bad.

The overreaction in the market was initially observed by JM Keynes (Bondt & Thaler, 1985). JM Keynes stated that, in general, events that occur momentarily and unexpectedly would affect the market in real-time, as indicated by the fluctuation of stocks from day today.

Psychologically, market players tend to give dramatic reactions to bad news. De Bondt & Thaler divide portfolios into portfolios that consistently perform well (winners) and portfolios that are consistently underperforming (loser). Overreaction occurs when investors overreact in response to the news shown by the loser portfolio outperforming the winner's portfolio where the average return of the loser's portfolio minus the average return of the winner's portfolio is greater than 0 or $\bar{R}_{Los,T} - \bar{R}_{Win,T} > 0$.

Price Reversal

A price reversal is defined as a sudden change in the direction of the price of a stock, index, commodity, or derivative security. This reversal occurs due to excessive supply/demand resulting in changes to the trends that have been formed so far. Another indicator is volume, and this volume moves in the direction of the trend. If the volume increases, the current price trend (down / up) is likely to continue. However, if the trading volume decreases, the current price trend will likely change (reversal). The reversal effect is

the reversal effect of the average return, which is another term for the winner-loser anomaly, namely the tendency for stocks that have poor performance (loser) to turn into stocks that have good performance (winner) in the next period and vice versa (Bondt & Thaler, 1985).

Winner-Loser Anomaly

A Winner-loser anomaly is a form of capital market anomaly that contradicts the concept of the efficient market hypothesis. The winner-loser anomaly was first put forward by De Bondt & Thaler in 1985. Using the US capital market, De Bondt & Thaler found that stocks that initially gave a very positive (winner) or very negative (loser) profit rate will experience a reversal in subsequent periods (Bondt & Thaler, 1985). Investors who buy loser stocks and sell them when they become winners will get a significant abnormal return. De Bondt & Thaler stated that the cause of the winner and loser anomalies is the overreaction hypothesis. This hypothesis states that the market has overreacted to information. In this case, market participants tend to set stock prices too high as a reaction to the news that is considered good and give prices too low as a reaction to the news that is considered bad.

Abnormal Return

Abnormal return is the difference from the actual return that occurs with the expected return in the future. Abnormal returns are searched using a single index model. The single index model is based on the observation that the price of a security fluctuates in the direction of the market price index. A particular way can be observed that most stocks tend to increase in price if the stock price index rises, and vice versa.

Contrarian Strategy

According to Darusman (2012), investors can use two investment strategies to get returns: the contrarian strategy and the momentum strategy. Contrarian strategy against the flow, namely, investors buy stocks that have decreased (loser) and sell them when they turn into winners or increase. Meanwhile, the momentum strategy is to buy shares when the stock price or index moves up in the hope of selling the shares when the stock price is higher than the purchase price during a specific period.

Conceptual Framework And Hypothesis

Analyzing Market Overreaction in Indonesia Stock Exchange

Overreaction events caused by excessive reactions in response to information made by investors can be seen by forming a winner portfolio and a loser portfolio. Informing the portfolio, the first step that must be taken is to calculate the abnormal return of each stock to be studied and then sort it from the largest to the smallest abnormal return—after being sorted, then grouping the stocks into a winner portfolio and a loser portfolio. Shares that have been formed are referred to as the formation period or period of formation to see a reversal in the testing period or observation period. The overreaction hypothesis can be seen if $t > 0$, $ACAR_{W,t} < 0$ and $ACAR_{L,t} > 0$. So it can be concluded that $[ACAR_{L,t} - ACAR_{W,t}] > 0$ or if the difference between ACAR loser and ACAR winner is large than zero (Bondt & Thaler, 1985).

Research by Han et al. (2015) suggests that market overreaction is more often observed in the stock market, classified as an emerging market than in developed markets. Several previous studies examined overreaction events in emerging markets. Research conducted by Ali et al. (2012) found strong evidence supporting the overreaction hypothesis in the Malaysian stock market. The overreaction is strongest over one to four weeks. The same result was also found in the Pakistan stock exchange conducted by Rehman and Said (2019), which found that investors had excessive reactions when responding to information. In addition, research on market overreaction on stock exchanges classified as emerging markets was also conducted by Reddy et al. (2020) tested the Shanghai Stock Exchange (SSE) in China 2009-2015. This study examined short and medium-term overreaction using monthly data and found an overreaction. The excessive reaction is shown by the return of the loser portfolio that outperforms the return of the winner's portfolio in both the short and medium-term. Still, with the same results, research examining market overreaction conducted by Lerskullawat & Ungphakorn (2019) on the Thai Stock Exchange in 1990-2016 shows an overreaction, especially after 12 months of loser portfolio. The existence of a reversal in the direction of the loser portfolio shows that the contrarian strategy is very suitable for this case. Based on this statement, the proposed hypothesis is:

H₁: There is a Market Overreaction in the Indonesian Stock Exchange

Analyzing Market Overreaction in the Singapore Stock Exchange

Overreaction events caused by excessive reactions in response to information made by investors can be seen by forming a winner portfolio and a loser portfolio. Informing the

portfolio, the first step that must be taken is to calculate the abnormal return of each stock to be studied and then sort it from the largest to the smallest abnormal return—after being sorted, then grouping the stocks into a winner portfolio and a loser portfolio. Shares that have been formed are referred to as the formation period or period of formation to see a reversal in the testing period or observation period. The overreaction hypothesis can be seen if $t > 0$, $ACAR_{W,t} < 0$ and $ACAR_{L,t} > 0$. So it can be concluded that $[ACAR_{L,t} - ACAR_{W,t}] > 0$ or if the difference between ACAR loser and ACAR winner is large than zero (Bondt & Thaler, 1985).

Ali (2020) found positive return momentum in the short term and no reversal in the long term. The absence of a reversal or reversal in the Singapore market indicates no overreaction or underreaction. Based on this statement, the proposed hypothesis is:

H₂: There is no Market Overreaction on the Singapore Stock Exchange

RESEARCH METHODOLOGY

The population data used in this research are companies listed on the Indonesia Stock Exchange (IDX) for testing on the Indonesian stock market and companies listed on the Singapore Strait Times Index (STI) for testing on the Singapore stock market.

The sample in this study was obtained by the purposive sampling method. This study uses a sample of companies with the highest market cap in each country's stock market. The criteria for this research sample are as follows: 1) Issuers that are listed in the LQ-45 index consistently for four consecutive years in the 2016 - 2019 period. 2) Issuers occupy the 30 position in the highest market capitalization on the Singapore Strait Times Index (STI) and have been listed since 2016. 3) Shares considered actively engaged in the research period, and the required data are available according to the research period.

This study uses data on stock closing prices and weekly stock market closing prices, which can be accessed through the stock price and investment website www.investing.com.

This research is divided into two stages, namely the portfolio formation stage and the observation stage. This formation is based on the sorted abnormal return value. The formation period is the period that shows the return value of each portfolio in the previous week or $t-1$. The testing period is the period that shows the return value of each portfolio during the next holding period, namely 1, 2, 3, 4, 12, 24, 36, 52, and 70 weeks. This holding period method uses the method used by Ali et al. (2012). The first step to building a portfolio

is to calculate the weekly return for each stock. The weekly return that is calculated is the weekly capital gain/loss with the formula:

$$R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} \quad (1)$$

Where:

$R_{i,t}$ = Actual return securities for firm i on week t

$P_{i,t}$ = Closing stock price for firm i on week t

$P_{i,t-1}$ = Closing stock price on week t-1

Then calculate the value of market return where in this study is meant as capital gain (loss) with the following method or formula (Jogiyanto, 2010):

$$R_{m,t} = \frac{P_{m,t} - P_{m,t-1}}{P_{m,t-1}} \quad (2)$$

Where:

$R_{m,t}$ = Market return

$P_{m,t}$ = Closing price market on week t

$P_{m,t-1}$ = Closing price market on week t-1

The abnormal return for each share is calculated using the market adjusted model method with the following formula:

$$AR_{i,t} = R_{i,t} - R_{m,t} \quad (3)$$

Where:

$AR_{i,t}$ = Abnormal return for firm i on week t

$R_{i,t}$ = Actual return for firm i on week t

$R_{m,t}$ = Market return on week t

After getting the abnormal return of each stock, then the stocks are sorted in ascending order. After sorting, the upper and lower third of all stocks form a portfolio rather than deciles or quartiles because the number of stocks is smaller than studies in other markets. The top third is classified as a winner portfolio, and the lower third is classified as a loser portfolio

(R. Ali et al., 2012). Cumulative Abnormal Return (CAR) is the amount of cumulative market-adjusted abnormal return in a single period of a stock during a specific period, in this case, the formation period.

$$CAR_{i,t} = \sum_{i=1}^n AR_{i,t} \quad (4)$$

Where:

$CAR_{i,t}$ = Cumulative abnormal return on period t

$AR_{i,t}$ = Abnormal return on week t

After the winner and loser stock portfolios are formed, observations are made of the abnormal returns generated by the two portfolios. The formula used in measuring the AAR value of the loser and winner portfolios is as follows:

$$AAR_t = \sum_{i=1}^k \frac{AR_{it}}{N} \quad (5)$$

Where:

AAR_t = Average abnormal return on week t

N = Total of securities

AR_{it} = Abnormal return securities for firm i on week t

Then, the AAR results will be used to calculate the Cumulative Average Abnormal Return (CAAR), with the following formula:

$$CAAR_t = \sum_{i=1}^k AAR_t \quad (6)$$

Where:

$CAAR_t$ = Cumulative average abnormal return on week t

AAR_t = Average abnormal return on week t

The observation process is continued by calculating the Average Cumulative Abnormal Return (ACAR) on each portfolio for each period, with the following formula:

$$ACAR_t = \sum_{i=1}^k \frac{CAAR_t}{k} \quad (7)$$

Where:

$ACAR_t$ = Average cumulative abnormal return of stocks on week t
 $CAAR_t$ = Cumulative average abnormal return of stocks on week t
k = Total of replication

After getting the ACAR results from each portfolio, calculate the difference between ACAR loser and winner portfolios. The ACAR difference is used to see any indication of an overreaction. This indication is shown by the ACAR of the loser portfolio that outperforms the winner's portfolio (Bondt & Thaler, 1985), with the following formula:

$$\Delta ACAR_t = ACAR_{L,t} - ACAR_{W,t} \quad (8)$$

Where:

$\Delta ACAR_t$ = The difference between $ACAR_{L,t}$ to $ACAR_{W,t}$ on week t

$ACAR_{W,t}$ = ACAR winner portofolio on week t

$ACAR_{L,t}$ = ACAR loser portofolio on week t

Then, calculate the t-statistic to see the significant level of ACAR's loser and winner portfolios. Tests were carried out using a one-sample t-test with a significant level of 5% to determine the difference in ACAR from each portfolio. Based on these results, it can be concluded that there is an excessive market reaction on the Indonesia and Singapore Stock Exchange.

RESULT AND DISCUSSION

Market Overreaction in Indonesia Stock Exchange

To see the phenomenon of market overreaction in the Indonesian stock exchange, it is necessary to see whether there is a reversal or not. This reversal of direction can be seen in the abnormal return value during the observation and testing periods where stocks that previously had a positive abnormal return will reverse the direction of producing a negative abnormal return and vice versa. Table 1 presents the ACAR results for the winner portfolio for each testing period. Winner and loser portfolios are formed using stock performance based on the previous week's return. The portfolio returns are then calculated for several weeks of ownership (holding period). The following are the research results on winner portfolios for 1 to 70 weeks after the formation period.

Table 1. ACAR Portfolio Winner, Loser, and Loser-Winner

Portofolio	Formation Period	Holding Period (weeks)								
		1	2	3	4	12	24	36	52	70
Winner	0,067	-0,004	0,018	0,062	0,089	0,139	0,242	0,524	0,371	0,817
Loser	-0,048	-0,015	-0,014	0,070	0,178	0,135	0,453	0,396	0,577	0,736
Loser – Winner	-0,115	-0,011	-0,032	0,008	0,089	-0,004	0,211	-0,128	0,206	-0,081

Source: Processed Data, 2021

From table 1, it can be seen that the comparison of the average cumulative abnormal return in the formation period and the test period shows that the most apparent reversal occurs in the loser portfolio. The winner's portfolio has a positive return for the formation period, and the loser's portfolio has a negative return. A reversal occurred during the testing period where the loser portfolio had a positive return while the winner's portfolio had a negative return.

In the winner's portfolio, there is a positive return in the formation period of 0.067. However, the return has a reversal in the first week of -0.004. However, a positive trend increases gradually in the rate of return for the test period of 2 weeks and above except for the 52 weeks holding period with the highest return occurring at 70 weeks of 0.817.

Conversely, there is a positive return on the loser portfolio during the testing period after the two-week holding period. In the formation period, the loser portfolio has a return of -0.048. It begins to experience a reversal in the three-week holding period. Up to 70 weeks of holding period, the loser portfolio has a rate of return that tends to increase. Overall, there is a significant return reversal in the loser's portfolio. The results of this study are different

from the results of research by Ali et al. (2012), which found the strongest reversal in the one to four-week holding period in both portfolios.

Then, there are different reversal rates for the loser and winner portfolios. A reversal occurs at a 3 to 70 week holding period for the loser portfolio. As for the winner's portfolio, the reversal only occurs in the one-week holding period. This implies a strong overreaction to the loser portfolio where investors tend to overestimate negative news rather than positive news, which encourages overreaction and reversal of the loser's portfolio.

Meanwhile, the difference between the average cumulative abnormal return of the loser and winner portfolios shows mixed results. In the formation period, there is a negative return on the difference between the two portfolios of -0.115. Then there was a reversal at the 3, 4, 24, and 52-week holding period. At 1, 2, 12, 36, and 70 weeks the holding period had negative returns. This implies that the overreaction occurred at different holding periods. If you look at the ACAR difference, there is a positive return on the difference between the two portfolios. However, this event was not accompanied by a reversal in the direction of the two portfolios. In other words, an overreaction is indicated by the loser portfolio return outperforming the loser portfolio return in the testing period after a reversal. For example, in the three-week holding period, there was a reversal in the loser's portfolio. However, there was no reversal in the winner's portfolio.

In contrast, the ACAR difference in the two portfolios showed a positive return. From these results, it can be concluded that the strongest overreaction occurs in the loser portfolio. The contrarian strategy will only be profitable during the 3, 4, 24, and 52-week holding periods. The existence of a reversal in the loser's portfolio supports the contrarian strategy, namely buying stocks that experience losses and selling when the shares move up (Dissanaike, 1997).

Table 2. Significance Test Results for ACAR Winner, Loser, and ACAR Difference

One-Sample Test						
Test Value = 0						
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
ACAR Winner	2.741	8	.025	.250889	.03982	.46196

ACAR Loser	3.092	8	.015	.279556	.07107	.48804
ACAR Loser- Winner	.728	8	.487	.028667	-.06214	.11948

Source: Processed Data, 2021.

A significance test was carried out with a one sample t-test at a significance level of 5% ($\alpha = 0.05$) to see the widespread overreaction phenomenon. Table 2 presents the results of the significance test for ACAR winner, loser, and ACAR selection.

The results of the analysis on the winner's portfolio show that the t value is positive (2.741) and the significance value is less than α ($0.025 < 0.05$), which states that the ACAR winner has a positive and significant value. Thus, it is not statistically proven that the ACAR winner's value has a negative value, indicating there is no market overreaction in the winner's portfolio. This study also supports the research results of Pratama et al. (2016), which state that winner portfolios tend to produce positive returns during the study period so that there is no indication of market overreaction.

Furthermore, the results of the analysis on the loser portfolio show that the t value is positive (3.092) and a significance value less than α ($0.015 < 0.05$), which states that the ACAR loser has a positive and significant value. This shows that the loser portfolio has a positive return in the test period, indicating a formation period's reversal. Thus, it is statistically proven that the ACAR loser value has a reversal, indicating a market overreaction. The results of this study support the results of research by Octavio & Lantara (2014), which states that market overreaction occurs in the loser portfolio.

Then, the analysis results on the difference in ACAR of loser and winner portfolios show that the t value is positive (0.728). This states that the difference between the ACAR loser and the winner has a positive value, indicating that the loser portfolio's return can outperform the return of the winner's portfolio. Meanwhile, the significance value is more significant than α , namely $0.487 > 0.05$, which indicates market overreaction, but it is not significant.

Overall, there is a phenomenon of market overreaction on the Indonesian stock exchange, especially in the loser portfolio, which has the most substantial reversal and supports the research of Bondt & Thaler (1985). This study also supports the research results by Bowman and Iverson (1998) in a study entitled "Short-run Overreaction in The

New Zealand Stock Market," examining overreaction events on the New Zealand market in 1967-1986 using a weekly period. The findings indicate that there is an overreaction, especially for the loser portfolio in the short term. The same results were also found in the results of the study by Reddy et al. (2020) tested the Shanghai Stock Exchange (SSE) in China 2009-2015 in their research entitled "Overreaction Effect: Evidence From an Emerging Market (Shanghai Stock Market)." This study examined short and medium-term overreaction using monthly data and found an overreaction. The excessive reaction is shown by the return of the loser portfolio that outperforms the return of the winner's portfolio in both the short and medium term—the results of this study support market overreaction found in exchanges classified as emerging markets.

In addition, based on the test results with a one-sample t-test on the difference between ACAR loser and winner, it shows a positive value. However, it is not significant because the significance value is more than 5%. Based on the test results with the one-sample t-test, it means that, on average, all samples in the winner and loser portfolios cannot support a market overreaction on the Indonesia Stock Exchange even though it produces a positive ACAR difference. This is because the market overreaction occurs in a separatist manner. The results of this study support the results of research by Maharani & Witiastuti (2015), which states that the market overreaction on the Indonesia Stock Exchange does not occur constantly but is separatist. After being tested, the results are not statistically significant. This study rejects the research results by Amelia & Wijayanto (2018), which found that there was no market overreaction in mining companies listed on the Indonesia Stock Exchange where the difference between ACAR losers and winners gave positive results. That is, loser portfolio returns are not able to outperform winner portfolio returns during the testing period. The results of this study also reject the results of research by Pasaribu (2011) which found no market overreaction, especially for stocks included in the LQ-45 index.

Market Overreaction in Singapore Stock Exchange

To see the phenomenon of market overreaction on the Singapore stock exchange, it is necessary to see whether there is a reversal or not. This reversal of direction can be seen in the abnormal return value during the observation and testing periods where stocks that previously had a positive abnormal return will reverse the direction of producing a negative abnormal return and vice versa. Table 3 presents the ACAR results for the winner portfolio for each testing period. Winner and loser portfolios are formed using stock performance

based on the previous week's return. The portfolio returns are then calculated for several weeks of ownership (holding period). The following are the research results on winner portfolios for 1 to 70 weeks after the formation period.

Table 3. ACAR Portfolio Winner, Loser, and Loser-Winner

Portfolio	Formation Period	Holding Period (weeks)								
		1	2	3	4	12	24	36	52	70
Winner	0,041	0,037	0,099	0,153	0,225	0,585	1,126	1,775	2,389	3,323
Loser	-0,016	-0,001	0,103	0,138	0,276	0,504	1,164	1,833	2,365	3,160
Loser – Winner	-0,057	-0,038	0,004	-0,015	0,052	-0,081	0,038	0,058	-0,024	-0,163

Source: Processed Data, 2021.

From table 3, it can be seen that the comparison of the average cumulative abnormal return in the formation period and the test period shows that a reversal occurs only in the loser portfolio. The winner's portfolio has a positive return for the formation period, and the loser's portfolio has a negative return. During the testing period, there was a reversal where the loser portfolio had a positive return.

In the winner's portfolio, there is a positive return in the formation period of 0.041. However, there is no reversal in the testing period. During the test period, a positive trend increased gradually in the rate of return for the test period of 1 to 70 weeks.

In contrast, there is a reversal in the testing period for the loser portfolio. In the formation period, the loser portfolio has a return of -0.016. It begins to experience a reversal in the two-week holding period with a rate of return that tends to increase. Overall, there is a significant return reversal in the loser's portfolio.

Based on these results, it can be said that a reversal does not occur in winner portfolios where the return during the holding period shows a positive value. Meanwhile, there is a consistent reversal from 2 to 70 weeks of holding period in the loser portfolio. This implies a strong overreaction to the loser portfolio where investors tend to overestimate negative news rather than positive news, thus encouraging excessive reactions and reversal of direction in loser portfolios.

Meanwhile, the difference between the average cumulative abnormal return of the loser and winner portfolios shows mixed results. If it produces a positive return, it supports the overreaction hypothesis. In the formation period, there was a negative return on the difference between the two portfolios of -0.057. Then there was a reversal at the 2, 4, 24, and 36-week holding period. At 1, 3, 12, 52, and 70 weeks the holding period had negative returns. This implies that the overreaction occurred at different holding periods. At the ACAR difference, there is a positive return on the difference between the two portfolios. However, this event was not accompanied by a reversal in the direction of the two portfolios. In other words, an overreaction is indicated by the loser portfolio return outperforming the loser portfolio return in the testing period after a reversal. For example, in the 2-week holding period, there was a reversal in the loser's portfolio. However, there was no reversal in the winner's portfolio.

In contrast, the ACAR difference in the two portfolios showed a positive return. From these results, it can be concluded that the strongest overreaction occurs in the loser portfolio. The contrarian strategy will only be profitable on the 2, 4, 24, and 36-week holding periods.

Table 4. Significance Test Results for ACAR Winner, Loser, and ACAR Difference

		One-Sample Test					
		Test Value = 0					
		T	D f	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
						Lower	Upper
ACA		2.74	8	.02	1.07911	.1730	1.9851
R Winner		6		5	1	6	6
ACA		2.77	8	.02	1.06022	.1780	1.9423
R Loser		1		4	2	6	8
ACA		-.799	8	.44	-.018778	-	.03539
R Loser- Winner				7		.07295	

Source: Processed Data, 2021.

A significance test was carried out with a one sample t-test at a significance level of 5% ($\alpha = 0.05$) to see the overall overreaction phenomenon. Table 4 presents the significance test results for the ACAR winner, loser, and ACAR difference.

The results of the analysis on the winner's portfolio show that the t value is positive (2.741) and the significance value is less than α ($0.025 < 0.05$), which states that the ACAR winner has a positive and significant value. Thus, it is not statistically proven that the ACAR winner's value has a negative value, indicating there is no market overreaction in the winner's portfolio.

Furthermore, the results of the analysis on the loser portfolio show that the t value is positive (3.092) and a significance value less than α ($0.015 < 0.05$), which states that the ACAR loser has a positive and significant value. Thus, it is statistically proven that the ACAR loser value has a reversal, indicating a market overreaction.

The results of the analysis on the difference between the ACAR loser and the winner show that the t value is negative (-0.799), and the significance value is more significant than α ($0.487 > 0.05$). This states that the difference between the ACAR loser and the winner has a negative value, which indicates that the return of the loser portfolio cannot outperform the return of the winner's portfolio and is not significant because the significance value is greater than 5%. Thus it is not proven that there is a market overreaction on the Singapore Stock Exchange because the return of the loser portfolio is not able to outperform the return of the winner's portfolio, but it is not significant.

Overall, the results of this study reject the results of research by Bondt & Thaler (1985), which found there was a market overreaction in which loser portfolio returns were able to outperform winner portfolio returns marked by the ACAR difference greater than zero. The results of this study also reject the results of previous studies which found market overreaction on stock exchanges classified as developed markets, including Mazouz & Li (2007) on the UK stock exchange, Bowman & Iverson (1998) on the New Zealand stock exchange, Piccoli et al., (2017) on the United States stock exchange.

The results of this study support the results of Ali (2020), which found positive momentum returns in the short term, and there is no reversal in the long term. The absence of a reversal or reversal in the Singapore market indicates no overreaction or underreaction.

CONCLUSION

Based on the research results that have been described in the previous chapter, the author has the conclusion as follows:

Market overreaction occurred in the Indonesian stock market, but in a separatist manner, especially in the loser portfolio, which experienced the strongest reversal. This proves that investors tend to overreact to the information received. The research results also show that a contrarian strategy can be used in investing, but one must be careful.

Market overreaction does not occur on the Singapore stock exchange. This proves that investors in the Singapore market have tended to behave rationally in making investment decisions because investors have received sufficient information to analyze the market and make investment decisions.

The limitations of this study are that this study only examines market overreaction as part of the field of behavioral finance. Investor rationality, which impacts market efficiency, can be influenced by various attitudes and actions as described in behavioral finance theory. Suppose other biases such as herding behavior, disposition effects and other variables related to behavioral finance are also examined. In that case, it will be able to impact changes in a more rational direction for investors slowly. This study only examined the 2016-2019 period, and the research results will be more accurate if you extend the research period. This study only uses the LQ-45 index. It is better to use all sectors on the Indonesia Stock Exchange to describe the results representing all existing stocks.

Suggestions for future researchers: It is better to extend the research period and add research objects such as all sectors in the Indonesia Stock Exchange to describe the results that represent all existing stocks. Then suggestions for investors should deepen the knowledge of stock analysis such as technical and fundamental analysis and gather relevant information under the investment planning that has been made. If more and more information is received, both information about the market and investment science, the rationality of investors will increase so that a more efficient market will be formed.

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