

*Research Article*

# How Well is the Implementation of CAPM in Condition of Market Anomaly? Case in Market Overreaction Anomaly at Indonesia Stock Exchange

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**Abstract.** This study aims to test the occurred of the market anomaly, iemarket overreactions in Indonesian stock market at the Covid-19 pandemic. If the event occurs then be tested whether a contrarian investment strategy is relevant to be implemented. It will also be tested whether the CAPM's market risk factor will affect the returns. The data from the Indonesia Stock Exchange (IDX) used are the stock price in periods of January 2019-December 2020, which during the pandemic were have the potential to be profitable or detrimental. Through the formation of the portfolios that called as as the winner and the losers, testing of returns reversals could be done to prove the occurs of the market overreaction. The results of this research are as follows: First, markets overreaction anomaly event has occurred in Indonesian stock market in periods of Covid-19 pandemic. The reversal of return occurs for most shares those have the potential to be profitable or detrimental, or have been proven those it profits rates has increased or decreased in the periods of the pandemic. Second, the contrarian strategy is relevant to be implemented in the short term in Indonesian stock market, which is in this pandemic. By implementing the contrarian strategy, a profitable return is obtained from the difference between the returns of the losers and the winners through their each of observation period. Third, market risk factors based on the CAPM have a significant effect only for the losers stocks.

**Keywords:** *CAPM; Contrarian Strategy; Market Overreaction; Return Reversal; Winner-Loser Portofolio.*

## A. INTRODUCTION

Capital Asset Pricing Model (CAPM) is an asset pricing model used to assess the fair price of a financial asset with one of the underlying assumption is market equilibrium. By this assumption no abnormal returns can obtained. The abnormal returns are the difference between the realizable returns by the investors and their expected returns. The asumption of the market equilibrium is related to the theory of the efficient market hypothesis which states, the more efficient a market, the less chances for investors getting a favorable returns. However, the findings from several studies have proven that there are anomalies or conditions that are not in accordance with the EMH theory, which call as the markets overreaction. This market condition creates opportunities for investors to get favorable returns by implementing the relevant active investment strategy which the contrarian strategy.

According to De Bondt and Thaler (1985), to prove the anomaly of market overreaction, it needs to form portfolios consisting of a collection of shares. Those have positive and negative returns tendency, it called the winner and the loser. In condition of the market overreactions, shares in the winner or loser group will experience a price or returns reversal in the following periods. Since the loser shares will be winner in the next period, and vice versa, winner shares will become loser, the contrarian strategy is applied by buying loser shares and selling winner shares.

Meanwhile, Jegadeesh and Titman (1993) then introduced a momentum strategy as the vice versa of the contrarian. This strategy utilizes shares price movements in the hope that the movement will continue. If the benefits of the contrarian strategy are obtained from the reversal of the returns, then the benefits of the momentum strategy are obtained from the continuation of the returns. Both the reversal of the returns or the continuation depends on the return period and investment horizon used. This condition showed the price movements of shares in the winners group or losers that will continue generally in the short term.

Some researchers such as De Bondt and Thaler (1985), Chopra, et al. (1992), and Lakonishok, et al. (1994) found that market overreaction occurs in the long run, whereas Lo and MacKinlay (1990), Jegadeesh and Titman (1995), Nam, et al. (2001) and Reddy et al (2020) found that the anomaly occurs in the short term. In Indonesia itself, there are several researchers who have found that the anomaly occurred in the short and long term as well which are marked by a patterns of the reversal of the returns. Hadioetomo and Sukarno (2009), Octavio and Lantara (2014), Aulia, et al (2016), Sembiring, et al (2016), and Sasmikadewi and Dewi (2017) found that the anomaly occurs in the short term. Meanwhile Wacana (2017) found that this anomaly occurs in the long term, this is also mentioned by Octavio and Lantara (2014) and Sembiring, et al (2016). In this anomaly condition, the implementation of the contrarian investment strategy has found profitable.

Meanwhile some other researchers who found the event of market underreaction in Indonesia are Pratama, et al (2016) and also Santosa and Santoso (2019). This indicates that there is an empirical phenomenon related to the event of overreaction or underreaction in the Indonesian stock market.

Bad or good informations are a trigger for investors reactions that cause anomalies such as this market overreaction. The informations can be sourced from internal and external conditions of the company. The external condition that is currently affecting the national and international economy are the Corona pandemic (Covid-19) which has spread since December 2019.

The economic condition of Indonesia in the third quarter of year 2019 had been showed a slowdown. Data released by the Central Statistics Agency (BPS) shows that in the third quarter of year 2019 economic growth was 5.02%, while in the second quarter was 5.05%. Meanwhile, in the same period (third quarter) in the previous year was 5.17%. BPS also stated that the economic growth data in the third quarter of year 2019 was the lowest in the last two years. It was also stated that the pressure on the national economy throughout of year 2019 was getting stronger, following the global economic slowdown. This condition was further exacerbated by the outbreak of the Covid-19 pandemic in Indonesia in early 2020.

In stock exchange trading activities, the performance of Indonesia Stock Exchange (IDX) through Composite Stock Price Index (CSPI) as the indicator also showed very fluctuating conditions during the Covid-19 pandemic. Tempo.co noted that the decline in CSPI to 37.36% since the beginning of 2020 was due to the sentiment of the Covid-19 pandemic. In fact, during the last two weeks in mid-April 2020, CSPI has experienced at least five temporary trading suspensions because it fell by 5% in one day.

Indonesia Stock Exchange also noted an increase in the value of daily transactions in one week during the pandemic crisis. It was noted previously that at the end of March 2020, the CSPI had decreased by 14.5% in a week, from 4,907.57 to 4,194.94. The market capitalization value also decreased by 13.5% or Rp. 824 trillion, from Rp. 5,678.27 trillion to Rp. 4,854.05 trillion. However, the average daily transaction value and the average daily transaction volume increased. The average daily transaction value increased by 2.12% from Rp. 7,821 trillion to become Rp. 7,987 trillion. Meanwhile, the average daily transaction volume was 7.302 billion units of shares, up 15.35% from 6,330 billion units of shares the

previous week. The IDX also noted an increase in the average daily transaction frequency of 12.94%, amounting to 411,606 thousand transactions from 472,770 thousand transactions at the close of trading the previous week. Then the IDX stated that as of March, foreign investors had recorded a net selling value of Rp. 794.07 billion. It makes the IDX optimistic that there are still many foreign investors willing to conduct transactions on the stock exchange.

Some financial analysts from securities companies and information sources such as CNBC Indonesia and kompas.com mentioned that there are several stocks that have the potential to be profitable for investors even though they also experience price fluctuations that have an impact on yields. These stocks then attracted the attention of researchers and at the same time supported the background for conducting research regarding the possibility of an overreaction of the market.

Based on all description above then the purposes of this study are to answer the research questions formulated in the several research problems. These problems are; first, whether the market anomaly, such of markets overreactions, occurred in Indonesian stock market in short term in during of Covid-19 pandemic; second, whether contrarian strategy relevant to be implemented; third, whether the CAPM's market risk factor affect the portfolio returns.

## **B. LITERATURE REVIEW**

### **1. Capital Asset Pricing Model (CAPM) and Efficient Market Hypothesis (EMH)**

In CAPM, beta as the market risk factor is a measurer of the volatility of the asset returns to the market returns. Sharpe (1964) introduced Capital Asset Pricing Model (CAPM) as the model used to determine the price of financial assets in condition of equilibrium market. In this condition, investors no longer can get the excess or return abnormal of returns from the established price level. If new informations relating to a financial assets enter to the market, the information will be used to analyze and interpret the value of the asset concerned so that there is a shift to the new equilibrium price.

CAPM theory is related to the concept of efficient market which tries to explain how the market processes information to get to a new equilibrium position. If a market reacts quickly and accurately to reach a new equilibrium price that fully reflects the available information, then the market is called an informationally efficient market, which is a market that reacts to the available information.

The efficient market hypothesis (EMH) was put forward by Fama (1970) who divided the market efficiency test into three categories which are related to its efficiency forms, namely weak-form tests, semi strong-form test, and strong-form tests. Investors who believe the market is in an efficient condition, will tend to apply a passive trading strategy by forming a portfolio that can replicate the market index. Meanwhile, investors who believe the market is in an inefficient condition will apply an active trading strategy based on technical and fundamental analysis to get the favorable returns. When the market becomes inefficient, securities will produce the ab-normal return, which is the difference between expected return and realized return. The expected return is determined using the market model as proposed by Brown and Warner (1985).

### **2. The Market Overreaction and the Contrarian Investment Strategy**

De Bondt and Thaler (1985) proved that there was a market overreaction in the American stock market. Through the formation of portfolios into the winners and the losers, they found the returns reversals of the portfolio in subsequent periods. De Bondt and Thaler (1985) suggest that in this condition, the investors should buy the loser shares and sell the

winner shares because there will be a returns reversal which causes loser shares to outperform and provide higher returns than winner shares. Such a strategy is hereinafter known as a contrarian investment strategy.

The market overreactions implies the condition of the losers shares that will outperform the winners shares in the next period. Based on this, so the contrarian strategy is implemented by buying the loser shares and selling the winner shares immediately, or also known as the buy low, sell high strategy. The returns from the application of this contrarian strategy is obtained from the return reversal. This strategy does not require an initial investment where investors will sell shares that are of interest to the market and use the funds obtained from the sale to buy shares that are less attractive to the market. The advantage of implementing the contrarian strategy is obtained from the positive of return difference between the losers and winner. The profit is shown if the return of the loser is able to outperform the winner.

Empirical studies have proven that market overreaction also occurs in Indonesia. Octavio and Lantara (2014) and also Sembiring, et al (2016) found the markets overreaction phenomenon in Indonesia stock market, especially in the losers shares. Apart from Indonesia, this phenomenon has also been found in other emerging markets, such as in Taiwan (Yang, 1997), Malaysia (Ruhani, et al., 2011), South Africa (Hsieh and Hodnett, 2011), Shanghai (Reddy, et al, 2020).

It has been mentioned previously that the opposite of market overreaction is the underreaction. This market condition gave another investment strategy, namely the momentum strategy introduced by Jegadeesh and Titman (1993). This strategy is based on markets hypothesis that utilizes shares price movements in the hope that the movement will continue. If the benefits of the contrarian strategy (long the past loser, short the past winner) are obtained from the reversals, then from the momentum strategy (short the past loser, long the past winner), the benefits are obtained from the continuation returns. The return reversal and continuation returns depend on the return period and investment horizon used (De Bondt and Thaler, 1985; Jegadeesh and Titman, 2001; Novy and Marx, 2012; Goyal and Wahal, 2013).

### **3. Implementation CAPM in Market Anomaly: Market Overreaction**

Several studies about CAPM have been conducted to test its ability to determinate the returns in market particularly in anomaly market conditions. It will be related to determinate the investment strategy will be used, whether contrarian or momentum strategies. Through implementation of contrarian strategy, Assefa et al. (2014) who conducted research on the American stock market found there were significant gains at shares of winner and loser but the losers profits were found to outperform winners. Another finding is that in addition to winners having a higher systematic risk (beta) than losers, the alpha values of both portfolios were found to be significantly positive. Whereas Ejaz and Polak (2015) found the short term momentum effect in several stock markets in the Middle East, however CAPM was unable to explain the benefits obtained, consistent with the research results of Grundy and Martin (2001), Griffin, et al. (2003), Naranjo and Porter (2004), and Zoghلامي (2011).

Chaudhury and Piccoli (2015) examined the behavior of shares in the Brazilian stock market and found that shares have a tendency to overreaction after negative events (or bad news) and normal reactions after positive events (good news). It this means that a short term overreaction occurs related to market fluctuations. Another finding is that the benefits obtained from implementing the contrarian strategy are influenced by the performance of the shares of the winner even though they have a lower beta value than the losers. While

Chowdhury, et al. (2015) who conducted research on the Bangladesh stock market, found that implementing a contrarian strategy in the short term was significantly profitable.

In Indonesia, Sembiring et al (2016) found that risk factor in CAPM can explain of the favorable returns in condition of market overreaction, especially in portfolio of losers. While Marchinfy and Ekaputra (2015) conducted research on shares in Indonesia with the aim of explaining how momentum strategy generates favorable returns by using CAPM. The results showed that the risk factor in the CAPM were more influent to the winner than the loser.

### C. METHOD

This research is a quantitative study in the field of financial management, particularly investment management in portfolios, using the theory of Capital Asset Pricing Model (CAPM) and Efficient Market Hypothesis (EMH). The research type aims to determine the clarity of the relationship between variables by testing the hypothesis (or the explanatory type research).

The research variables which are operationalized are as follows:

$$\text{Abnormal return: } AR_{i,t} = R_{i,t} - E(R_{i,t})$$

$$\text{Realized return (R}_{i,t}\text{): } R_{i,t} = (P_t - P_{t-1}) / P_{t-1}$$

$$\text{Expected return: } R_i = \alpha_i + \beta_i R_m + e_i$$

Cumulative abnormal return (CAR), average cumulative abnormal return (ACAR), grand average cumulative abnormal return (GACAR), are:

$$CAR_t = \sum_{t=1}^n AR_{i,t}$$

$$ACAR_t = CAR_t / n$$

$$GACAR_t = ACAR_t / n$$

Meanwhile, the variables to determine the effect of market risk factors based on the CAPM model are as follows:

$$\text{Excess return for portfolio (R}_{pt}\text{-R}_{ft}\text{): } R_{it} = \frac{P_t - P_{t-1}}{P_{t-1}}$$

$$\text{Excess return for market (R}_{mt}\text{-R}_{ft}\text{): } R_{mt} = \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}}$$

The research samples are the shares listed in Indonesia Stock Exchange (IDX) which consist are manufacturing, mining, telecommunications, transportation, hospital, pharmaceutical, tourism and banking sectors. The research period starts from January 2019 to December 2020, which is before the vaccination period which begins in Indonesia in early 2021. The methods for processing and analysis data are as follows: 1) Determining the observation periods consisting of the period for formation and the testing of portfolio, during January 2019 - December 2020, consist are 1-1, 3-3, and 6-6; 2) Forming the portfolios which are the winners and losers based on their return position to the average, whether an outperformed or underperform the average; 3) Analyzing the occurrence of the markets overreaction with the indicator whether there is a return reversal at the testing period. In this stage used statistical tools, such as one sample t test and the paired sample t test; 4) Analyzing the effect of market risk factors on returns of both the winners and losers based on the CAPM; 5) Formulating and testing the hypothesis.

Related to the questions research that mentioned previously so the hypotheses of this research are: first, anomaly market overreaction conditions occur in Indonesian stock market in short term ie, during early period of Covid-19 pandemic; second, the contrarian strategy is relevant to be implemented; third, the CAPM's market risk factor affect the portfolio returns.

#### D. RESULT AND DISCUSSION

The following table shows the descriptive statistics of the return of shares in the winner and loser groups during the formation period:

**Table 1. Results of Descriptive Statistic Information Periods**

Components	Losers			Winner		
	Observation periods					
	1-1	3-3	6-6	1-1	3-3	6-6
Averages	-0.078390	- 0.0003246	- 0.000000240	0.108833	0.00000026	0.0000002777
Deviation Standards	0.062337	0.0005559	0.000000009	0.074148	0.00000058	0.0000000062
Observation	23	7	3	23	7	3

Source: Data Proceed

Based on table 1, it can be seen that in the formation period (1-1, 3-3, 6-6), on averagely, the winners shares are superior to the losers. Furthermore, a statistical test called one sample t test was carried out to determine the significance of the results which showed by the table, as follows:

**Table 2. Results of One Sample t Test in Testing Periods**

Periods	Losers		Winners	
	Abnormal returns	Sig. $\alpha$ 1% *** $\alpha$ 5% **)	Abnormal returns	Sig. $\alpha$ 1% *** $\alpha$ 5% **)
<b>1-1</b>				
1 (1-2)	0.0131451	2.895***)	-0.11628	-7.427***)
2 (2-3)	0.0044935	4.319***)	-0.11316	-3.880***)
3 (3-4)	0.0109484	5.830***)	-0.04476	-4.144***)
4 (4-5)	0.0060245	5.586***)	-0.07798	-7.640***)
5 (5-6)	0.0141280	4.794***)	-0.04129	-4.016***)
6 (6-7)	0.0087111	5.186***)	-0.08281	-5.170***)
7 (7-8)	0.0066028	3.643***)	-0.13714	-2.937**)
8 (8-9)	0.0058779	3.475***)	-0.08830	-7.055***)
9 (9-10)	0.0080668	6.971***)	-0.02480	-2.701**)
10 (10-11)	0.0023547	1.025	-0.17466	-4.136***)
11 (11-12)	0.0117249	8.635***)	-0.01666	-2.247**)
12 (12-1 <sub>1</sub> )	-0.0300392	-2.563**)	-0.15145	-9.239***)
13 (1 <sub>1</sub> -2 <sub>1</sub> )	0.0026930	1.655	-0.91928	-7.180***)
14 (2 <sub>1</sub> -3 <sub>1</sub> )	0.0093929	3.840***)	-0.21383	-9.789***)
15 (3 <sub>1</sub> -4 <sub>1</sub> )	0.0263686	8.953***)	0.00145	1.0920
16 (4 <sub>1</sub> -5 <sub>1</sub> )	0.0098536	4.009***)	-0.06520	-4.560***)
17 (5 <sub>1</sub> -6 <sub>1</sub> )	0.0129244	4.484***)	-0.07418	-5.055***)
18 (6 <sub>1</sub> -7 <sub>1</sub> )	0.0119529	5.850***)	-0.04581	-3.942***)
19 (7 <sub>1</sub> -8 <sub>1</sub> )	0.0925841	7.475***)	-0.46632	-6.016***)
20 (8 <sub>1</sub> -9 <sub>1</sub> )	0.0299667	2.447***)	-0.14115	-9.436***)
21 (9 <sub>1</sub> -10 <sub>1</sub> )	0.2130535	7.005***)	0.00111	0.127
22 (10 <sub>1</sub> -11 <sub>1</sub> )	0.2783462	5.247***)	0.20491	1.190
23 (11 <sub>1</sub> -12 <sub>1</sub> )	0.2512322	3.291***)	0.53516	-4.499***)
<b>3-3</b>				
1 (1-3 – 4-6)	0.0000001583	4.601***)	-0.000002946	-10.948***)
2 (4-6 – 7-9)	0.0000002437	9.514***)	-0.000002624	-7.162***)

3 (7-9 – 10-12)	0.0000002291	6.921***)	-0.000002760	-10.454***)
4 (10-12 – 1 <sub>1</sub> -3 <sub>1</sub> )	0.0000002686	10.384***)	-0.000002762	-8.380***)
5 (1 <sub>1</sub> -3 <sub>1</sub> – 4 <sub>1</sub> -6 <sub>1</sub> )	0.0000002667	5.922***)	-0.000002669	-8.664***)
6 (4 <sub>1</sub> -6 <sub>1</sub> – 7 <sub>1</sub> -9 <sub>1</sub> )	0.0000002498	6.524***)	-0.000002428	-6.156***)
7 (7 <sub>1</sub> -9 <sub>1</sub> – 10 <sub>1</sub> -12 <sub>1</sub> )	0.0000002509	8.098***)	-0.000002545	-7.643***)
<b>6-6</b>				
1 (1-6 – 7-12)	0.0000002780	7.562***)	-0.000002545	-6.712***)
2 (7-12 – 1 <sub>1</sub> -6 <sub>1</sub> )	0.0000002695	9.836***)	-0.000001876	-5.725***)
3 (1 <sub>1</sub> -6 <sub>1</sub> – 7 <sub>1</sub> -12 <sub>1</sub> )	0.0000002479	6.305***)	-0.000001752	-4.154***)

Based on table 2, it can be seen that the returns reversal event occurred for both the losers and winners almost in throughout the periods. This condition indicates that market overreaction occurred in the Indonesian stock market in several stocks in the manufacturing, mining, telecommunications, transportation, and hospital.

Referring to the results shown in table 2, it is necessary to carry out a statistical of paired sample t test to determine whether there is a difference in value of the loser that become the winner, and vice versa. The result shows in following table:

**Table 3. Results of Paired Sample t Test in Testing Periods**

Periods	Losers		Winners	
	Abnormal returns	Sig. $\alpha$ 1% ***) $\alpha$ 5% **)	Abnormal returns	Sig. $\alpha$ 1% ***) $\alpha$ 5% **)
<b>1-1</b>				
1 (1-2)	0.0129785	2.499**)	-0.306324	-9.624***)
2 (2-3)	0.0184419	9.902***)	-0.235268	-3.294**)
3 (3-4)	0.0233061	8.718***)	-0.064124	-3.893**)
4 (4-5)	0.0108758	6.670***)	-0.162227	-7.195***)
5 (5-6)	0.0226181	6.341***)	-0.109363	-6.605***)
6 (6-7)	0.0123619	6.215***)	-0.187420	-4.879***)
7 (7-8)	0.0110160	6.618***)	-0.202753	-3.537**)
8 (8-9)	0.0179625	5.024***)	-0.161133	-6.209***)
9 (9-10)	0.0171315	7.663***)	-0.081457	-3.301**)
10 (10-11)	0.0035459	1.428	-0.274040	-6.530***)
11 (11-12)	0.0307904	8.496***)	-0.007199	-.495
12 (12-1 <sub>1</sub> )	-0.0178538	-1.071	-0.280376	-13.657***)
13 (1 <sub>1</sub> -2 <sub>1</sub> )	0.0184846	8.119***)	-0.068106	-4.769***)
14 (2 <sub>1</sub> -3 <sub>1</sub> )	0.0201545	9.401***)	-0.245391	-8.954***)
15 (3 <sub>1</sub> -4 <sub>1</sub> )	0.0452402	11.542***)	-0.072078	-2.772**)
16 (4 <sub>1</sub> -5 <sub>1</sub> )	0.0120086	3.490**)	-0.363142	-10.800***)
17 (5 <sub>1</sub> -6 <sub>1</sub> )	0.0203878	5.871***)	-0.161244	-5.392***)
18 (6 <sub>1</sub> -7 <sub>1</sub> )	0.0187732	9.048***)	-0.176549	-6.672***)
19 (7 <sub>1</sub> -8 <sub>1</sub> )	0.1419691	6.645***)	-0.155759	-10.389***)
20 (8 <sub>1</sub> -9 <sub>1</sub> )	0.0819339	5.843***)	-0.241959	-8.629***)
21 (9 <sub>1</sub> -10 <sub>1</sub> )	0.3550457	11.345***)	-0.134026	-1.065
22 (10 <sub>1</sub> -11 <sub>1</sub> )	0.2495051	4.473***)	-0.189525	-4.963***)
23 (11 <sub>1</sub> -12 <sub>1</sub> )	0.2585756	3.074***)	-0.331897	-6.953***)
<b>3-3</b>				
1 (1-3 – 4-6)	0.000003876	8.408***)	-0.0000053360	-10.993***)
2 (4-6 – 7-9)	0.000005357	12.890***)	-0.0000045810	-9.490***)
3 (7-9 – 10-12)	0.0000051564	9.927***)	-0.0000054160	-13.208***)

4 (10-12 – 1 <sub>1</sub> -3 <sub>1</sub> )	0.0022707002	1.000	-0.0000053075	-10.325***)
5 (1 <sub>1</sub> -3 <sub>1</sub> – 4 <sub>1</sub> -6 <sub>1</sub> )	0.0000050520	7.843***)	-0.0000052742	-10.774***)
6 (4 <sub>1</sub> -6 <sub>1</sub> – 7 <sub>1</sub> -9 <sub>1</sub> )	0.0000050881	9.517***)	-0.0000054883	-11.588***)
7 (7 <sub>1</sub> -9 <sub>1</sub> – 10 <sub>1</sub> -12 <sub>1</sub> )	0.0000045720	10.351***)	-0.0000054054	-11.342***)
<b>6-6</b>				
1 (1-6 – 7-12)	0.0000052145	11.252***)	-0.0000052787	-9.346***)
2 (7-12 – 1 <sub>1</sub> -6 <sub>1</sub> )	0.0000052562	13.663***)	-0.0000046965	-8.850***)
3 (1 <sub>1</sub> -6 <sub>1</sub> – 7 <sub>1</sub> -12 <sub>1</sub> )	0.0000045347	8.491***)	-0.0000043326	-9.256***)

Based on the results presented in table 3, it can be seen that there is a significant difference, which indicates that there has been a change (reversal) of the return the losers to be the winners and the winners to be the losers.

Furthermore, related to the opportunity to get the benefits by implemented contrarian investment strategies in market conditions that experience overreaction, it is necessary to test using of one sample t test to prove whether there is a significant gain. The test results are shown in the following table:

**Table 4. Results of One Sample t Test for Testing the Contrarian Strategy**

Periods	Losers		Winners	
	Abnormal returns	Sig. $\alpha$ 1% ***) $\alpha$ 5% **)	Abnormal returns	Sig. $\alpha$ 1% ***) $\alpha$ 5% **)
<b>1-1</b>				
1 (1-2)	0.0083561	2.277**)	-0.345392	-11.734***)
2 (2-3)	0.0109656	8.443***)	-0.224392	-3.100**)
3 (3-4)	0.0221030	7.720***)	-0.084196	-4.756***)
4 (4-5)	0.0112856	6.436***)	-0.154829	-6.398***)
5 (5-6)	0.0233482	6.715***)	-0.116205	-7.186***)
6 (6-7)	0.0139178	6.0520***)	-0.192803	-4.891***)
7 (7-8)	0.0104296	5.208***)	-0.239464	-4.280**)
8 (8-9)	0.0176015	4.672***)	-0.158760	-5.918***)
9 (9-10)	0.0176379	8.098***)	-0.086616	-3.535**)
10 (10-11)	0.0034951	1.395	-0.244859	-5.065***)
11 (11-12)	0.0281624	11.099***)	-0.016614	-1.102
12 (12-1 <sub>1</sub> )	-0.0149953	-.951	-0.295979	-14.947***)
13 (1 <sub>1</sub> -2 <sub>1</sub> )	0.0186907	8.978***)	-0.072408	-4.513***)
14 (2 <sub>1</sub> -3 <sub>1</sub> )	0.0223281	5.213***)	-0.253985	-7.692***)
15 (3 <sub>1</sub> -4 <sub>1</sub> )	0.0466024	11.616***)	-0.072579	-2.447**)
16 (4 <sub>1</sub> -5 <sub>1</sub> )	0.0100434	3.086**)	-0.360099	-8.191***)
17 (5 <sub>1</sub> -6 <sub>1</sub> )	0.0220958	6.607***)	-0.181149	-6.075***)
18 (6 <sub>1</sub> -7 <sub>1</sub> )	0.0183733	8.503***)	-0.181041	-6.954***)
19 (7 <sub>1</sub> -8 <sub>1</sub> )	0.1419691	6.645***)	-0.155759	-10.389***)
20 (8 <sub>1</sub> -9 <sub>1</sub> )	0.0819339	5.843***)	-0.241959	-8.629***)
21 (9 <sub>1</sub> -10 <sub>1</sub> )	0.3550457	11.345***)	-0.134026	-1.065***)
22 (10 <sub>1</sub> -11 <sub>1</sub> )	0.2495051	4.473***)	-0.189525	-4.963***)
23 (11 <sub>1</sub> -12 <sub>1</sub> )	0.2585755	3.074***)	-0.331897	-6.953***)
<b>3-3</b>				
1 (1-3 – 4-6)	0.0000003876	8.407***)	-0.0000053359	-10.993***)
2 (4-6 – 7-9)	0.0000005356	12.890***)	-0.0000004581	-9.491***)
3 (7-9 – 10-12)	0.0000005156	8.927***)	-0.0000005415	-13.208***)

4 (10-12 – 1 <sub>1</sub> -3 <sub>1</sub> )	0.0022707002	1.000	-0.0000053072	-10.325***)
5 (1 <sub>1</sub> -3 <sub>1</sub> – 4 <sub>1</sub> -6 <sub>1</sub> )	0.0000005052	7.843***)	-0.000005274	-10.774***)
6 (4 <sub>1</sub> -6 <sub>1</sub> – 7 <sub>1</sub> -9 <sub>1</sub> )	0.0000005088	9.517***)	-0.000005488	-11.588***)
7 (7 <sub>1</sub> -9 <sub>1</sub> – 10 <sub>1</sub> -12 <sub>1</sub> )	0.0000004572	10.362***)	-0.000005405	-11.342***)
<b>6-6</b>				
1 (1-6 – 7-12)	0.0000005214	11.253***)	-0.000005278	-9.346***)
2 (7-12 – 1 <sub>1</sub> -6 <sub>1</sub> )	0.0000005256	13.663***)	-0.000004696	-8.850***)
3 (1 <sub>1</sub> -6 <sub>1</sub> – 7 <sub>1</sub> -12 <sub>1</sub> )	0.0000004534	8.491***)	0.000004332	-9.256***)

Source: Data Proceed

Table 4 has shown that by implemented the contrarian investment strategy, it has obtained a difference favorable from the loser, and an unfavorable difference from the winner.

Furthermore, testing and analysis are carried out based on the CAPM model to determine the effect of market risk factors on portfolio. The testings are based on the position of each portfolio in the testing period (only for 1-1 formation). The test results are as follows (by e-views output):

Dependent Variable: Losers

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IHSG	-4.82E-05	2.25E-05	-2.139927	0.0492
C	0.378187	0.133563	2.831526	0.0126
R-squared	0.233884	Mean dependent var		0.094180
Adjusted R-squared	0.182810	S.D. dependent var		0.068416
S.E. of regression	0.061847	Akaike info criterion		-2.618164
Sum squared resid	0.057376	Schwarz criterion		-2.520139
Log likelihood	24.25439	Hannan-Quinn criter.		-2.608420
F-statistic	4.579287	Durbin-Watson stat		2.288477
Prob(F-statistic)	0.049205			

Dependent Variable: Winners

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IHSG	-3.80E-06	2.42E-05	-0.156663	0.8776
C	-0.073251	0.143761	-0.509533	0.6178
R-squared	0.001634	Mean dependent var		-0.095630
Adjusted R-squared	-0.064924	S.D. dependent var		0.064508
S.E. of regression	0.066570	Akaike info criterion		-2.471009
Sum squared resid	0.066473	Schwarz criterion		-2.372984
Log likelihood	23.00358	Hannan-Quinn criter.		-2.461265
F-statistic	0.024543	Durbin-Watson stat		2.844391
Prob(F-statistic)	0.877599			

Based on the test results, it can be seen that the market risk factor (beta) does affect to the losers but it does not to the winner. The results of the classical assumption tests carried out (normality, heteroscedasticity, autocorrelation, and multicollinearity tests), showed that

the estimation model formed has fitted to BLUE (best linear unbiased estimator) criterion. The BLUE criterion explains that the model is an estimator that can explain the portfolio well.

### **1. Analysis: Market Overreactions in Short Term in Indonesia Stock Exchange**

The Corona pandemic (Covid-19) broke out since December 2019 is expected to end at the end of 2020, although many parties feel pessimistic. It is because until entering the 4th quarter of 2020, this pandemic still needs to be watched out for because the number of infected patients with an indication of the red zone color remains high. This has further exacerbated the condition of the Indonesian economy, which since the third quarter of 2019 has shown a slowdown. BPS stated that the economic growth data in the 3rd quarter of 2019 was the lowest in the last two years. It was also stated that the pressure on the national economy throughout 2019 was getting stronger, following the global economic slowdown which was worsened by the outbreak of the Covid-19 pandemic in Indonesia in early 2020.

The performance of the Indonesia Stock Exchange (IDX) with the Composite Stock Price Index (CSPI) indicator also showed very fluctuating conditions during the Covid-19 pandemic. This was reinforced by information from Tempo.co which noted that the decline in the JCI to 37.36% since the beginning of 2020 occurred as a result of the sentiment of the Covid-19 pandemic. The sentiment over the Covid-19 pandemic has the opportunity to cause an overreaction from investors, which is a form of anomaly in the capital market. Empirically this market overreaction can occur in the short and long term.

During the observation period in 1-1, 3-3, and 6-6, there were around 25 stocks that consistently formed whether winners or losers portfolios. All come from the manufacturing, mining, telecommunications, transportation, hospitals, pharmaceutical, tourism and banking sectors. The winners have higher average returns compared to the losers during the formation period. Statistical test results show that the average returns between losers and winners is almost entirely significant. This provides information that in general, reversal returns event that are indicators of market overreaction occur significantly in both losers and winners. The reversals generally occur in short-term periods, ie 1 month, 3 months and 6 months. This condition is caused by overreaction of investors to the arrival of short-term information where they tend to set stock prices too high as a reaction to information that is considered good and prices that are too low for information that is considered bad. This phenomenon then reverses when the market realizes it has overreacted, so that the price of the next winning stock drops drastically, followed by an increase in the price of the losing stock.

For certain periods, the returns reversal becomes insignificant, such towards the end of 2019, the beginning of 2020 and the end of 2020. The periods are the period after being the released of official information about the Covid-19 pandemic and the regulation about the social restrictions of large scale. Also the socialization about plans to administer the vaccine nationally which is in 2021. These imply the prudence of market participants in responding to the conditions that will occur. In accordance with information obtained from BPS, Indonesia's economic condition since the third quarter of 2019 has indeed shown a slowdown and this period was the lowest period of economic growth in the last two years. It was also stated that the pressure on the national economy throughout 2019 was getting stronger, following the condition of the global economic slowdown which was further exacerbated by the outbreak of the Covid-19 pandemic in Indonesia at the beginning of 2020. All these suspected the influenced to investors behavior in making their investment decisions.

Referring to the research hypothesis that has been formulated previously, it can be concluded that in the early periods of Covid-19 pandemic, the markets overreactions occurred in the Indonesia stock market, specially in the short term periods. The results of this study

are consistent with the findings of Lo and MacKinlay (1990), Nam, et al (2001), Octavio and Lantara (2014), Sembiring et al (2016) and Reddy et al (2020). However, there are also indications that the market is experiencing underreaction in the short term, namely in periods where there is no significance to the test results.

## **2. Analysis: The Implementation of Short Term Contrarian Investment Strategy**

Based on the obtained results from the testing periods, both winners and losers mostly have a significantly different returns than their returns in formation period. In this condition, by applying a contrarian investment strategy, the gains are obtained from the difference in returns between the losers shares and winners, based on their returns during the observation periods. Investors are advised to buy the losers and sell the winners because in the long or short term there will be a reversal that will cause loser shares to outperform winner shares.

The reversals of returns indicating the market experience overreaction, conversely, if there is not, then the market is probably experience underreaction. This condition is indicated in several periods in the short term, namely in periods where there is no significance in the test results.

Referring to the research hypothesis that has been formulated previously, it can be concluded that in short term which is in the early periods of the Covid-19 pandemic (January 2019 - December 2020), the contrarian investment strategy was effectively applied into the market that experienced overreactions. The results of this study are consistent with the findings of researchers such as Octavio and Lantara (2014), Chowdhury et al (2015), Sembiring et al (2016) and Reddy et al (2020).

## **3. CAPM Analysis: The Influence of Market Risk Factors on the Returns**

Based on the research results for the winners portfolio, market risk factors were found to have no effect. The formed estimation model explains though the markets overreaction occurs, this event is not caused by market risk factors but is likely caused by other factors that are empirically influential, such as firm size.

For the losers, market risk factors have a negative and significant effect. The formed estimation model explains that the markets overreaction occurs is influenced by the fluctuation of the market which is called as the market risk. The results reinforce the support of empirical studies stated that the overreactions are more occurs to the losers.

In general, the losers have a high beta value which has the potential to produce a higher rate of return compared to winner shares which generally have a low beta value. These conditions explains that market risk of CAPM influence to the market overreactions, especially in the loser shares. The results of this study are consistent with the findings of researchers such as Asefa (2014), Sembiring et al (2016) and Reddy et al (2020).

## **E. CONCLUSION**

The market overreaction occurred in the Indonesian stock market in the period of the Covid-19 pandemic. Return reversals have occurred for some stocks that were potentially profitable or detrimental during the period. This anomaly has been shown to occur in the short term. Under these conditions, a contrarian investment strategy can be applied effectively in the Indonesian stock market. Both winners and losers have mostly had higher or lower return reversal significantly than the returns when the stock was in its previous position. By implementing a contrarian investment strategy, a profitable return is obtained from the difference between the losers' and the winners' returns in the period of observation.

Market risk factors based on the Capital Asset Pricing Model (CAPM) have a significant effect on the losers returns, while for winners this risk has no effect. The

implication of this research is that investors can apply a contrarian investment strategy in the short term in the Indonesian stock market, with the aim of seeking profits during the pandemic. Investors also need to pay attention to stock market risk factors because they are proven to affect the rate of return. However, for further research, it is necessary to consider the use of a longer period to test the consistency of the application of the contrarian strategy in generating profits.

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