

CUMULATIVE AVERAGE ABNORMAL RETURN AND SEMISTRONG FORM EFFICIENCY TESTING IN INDONESIAN EQUITY MARKET OVER RESTRUCTURING ISSUE

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ABSTRACT

Efficient market hypothesis is important in finance. Investors will expect superior gains from their investment strategies with respect to the risk profile. Event study is an approach to assess the impact of the information on the stock prices. If the market is efficient, the price of securities will be adjusted quickly to the announcement day. The objective of this study is to test the efficiency of Indonesian Stock Market in semi-strong form with respect to 19 recent merger announcements since year 2000. In order to analyze the effect of the announcement, Event Study Methodology is conducted by calculating the Abnormal Returns (AR) of each stock, Average Abnormal Returns (AAR), and Cumulative Abnormal Return (CAR) 30 days prior to the merger announcement and 30 days after the merger announcement (event window). To calculate the Abnormal Return, market model is employed by regressing the daily stock return with the corresponding market return on the estimation period. Parametric and non-parametric test on the AAR is used to test for efficiency. The findings from this research is that Indonesian stock market is efficient in semi-strong form in the case of merger announcements.

Keywords: Capital market, Efficient markets hypothesis, Abnormal return, Merger and acquisition, Event study, Market model.

Contribution/ Originality

This study is one of very few studies which have investigated the efficiency of Indonesian stock market in semi-strong form in the case of successful merger announcements. Event study is conducted to analyze the efficiency which uses the market model approach to calculate the abnormal return in the determined timeframe. Both, parametric and non-parametric test are being used to test for market efficiency.

1. INTRODUCTION

The change in business environment, such as in information technology and globalization today has made tougher business competition which force some companies to adapt to the business environment quickly in order to survive or increase their performance rapidly. Some strategies are deployed in order to increase their market share and expand their business. One strategy that is commonly used is takeovers of other firms.

Mergers and acquisition are one strategic business decisions to increase the company performance in facing the strong competition in the business environment nowadays. Business expansion is one way to make a firm larger and stronger. According to [Payamta and Machfoedz \(1999\)](#) There are two form of business expansion, internal expansion and external expansion. Increasing the production capacity or develop a new line of business is an example of internal expansion, whereas company takeovers, such as mergers and acquisitions are an example of external expansion.

Mergers is the combination of two companies where a new corporate entity is created, whereas acquisition involves the purchase of another firm's asset or shares where the acquired firm still runs it business as legally owned subsidiary of the acquirer. There are many motives behind takeovers. According to Johnson, Whittington & Scholes in their book [Johnson *et al.* \(2011\)](#), motives of mergers and acquisition can be categorized into three groups, which are strategic motives, financial motives, and managerial motives. Strategic motives is focused on improving and developing the business, such as extension in products or markets, consolidation, and capabilities. Financial motives focused on the best use of financial resource and concerned more with improved financial performance, such as financial efficiency, tax efficiency, and asset stripping or unbundling. Managerial motives is focused in the self-interest of managers and usually not the interest of shareholders.

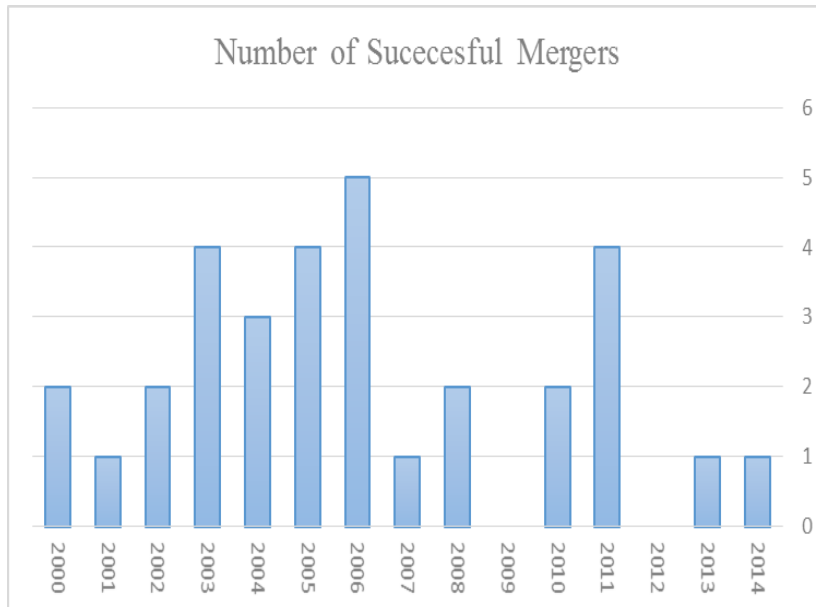
In Indonesia, Mergers and Acquisitions became popular topic in the business environment since the introduction of act number 1 year 1995 about Limited Company ("UU 1/1995"). The term "Merger and Acquisition" became more popular in Indonesia since the merger of four publicly owned banks in 1998, which is known today as Bank Mandiri.

The numbers of mergers and acquisition action in Indonesia has increase due to the growth in the world and domestic economy. According to KPPU (Komisi Pengawas Badan Usaha), the year 2010 and 2011 were the years which mergers wave hits Indonesia. KPPU also predict that the number of mergers will keep increasing over the following years. Graph 1 shows the numbers of successful mergers announcement since year 2000.

For developing countries like Indonesia, Merger and Acquisition wave give a positive impact to its country because it invites foreign investors to invest in Indonesia. This is good for the national economy because Indonesia will receive capital support from foreign investors.

According to KPPU, in 2010 there are 7 notification of mergers/acquisition where three of them involving foreign actors. In 2011 the number of mergers/acquisitions notification increases

significantly, from only 7 notification in 2010 to 45 notification in 2011 where 18 of them involving foreign actors.



Graph-1. Number of mergers since year 2000

Mergers and Acquisition are used to increase the performance and profitability of the company. Thus, the announcement of successful mergers and acquisitions gave a signal to investors to invest in the stocks. Investors will hope that later the price will spike and they will get a positive return from their investments. The measure of investor's return will be calculated using the abnormal return, which is the difference between the actual return and expected return. If the actual return turns out to be larger than the expected return, it means that investors earn profit from their investment. If actual return is smaller, it means that they experienced a loss on their investment.

In an efficient market, price will fully reflect to all available informations. In other word, an information regarding the prospect of the company will affect the stock price to react quickly, which makes impossible for investors to earn excess return or abnormal return. According to [Fama \(1970\)](#), there are three form of market efficiency. First is weak form efficiency where the price reflects historical informations. Second is semi-strong form efficiency where prices not only reflect historical information, but also all public information. The last form is strong form efficiency where the price reflect all public and private information. In an efficient market, it will be impossible for investors to earn positive abnormal return. In this study, semi-strong form of market efficiency will be tested, using merger announcement as the public information.

2. LITERATURE STUDY

To support this research, previous findings and journals related to this topic is needed as a references for this research. These journals gave insight for methodology that is commonly used to identify the efficiency in capital markets. More importantly, related journals can be used as a benchmark for the results of this research findings. Below are domestic and international papers that have related topic with this research.

[Khan and Ikram \(2012\)](#) in their paper, “Testing the efficiency of Indian Stock Market Vis-à-vis Merger and Acquisition – A study of Indian Banking Sector”, used abnormal return to determine the effect of merger announcement in banking industry in India from the year 2003 until 2009 on stock performance. Khan & Ikram used the market model on 6 merger cases in banking sector to calculate the abnormal return which uses the OLS regression in the estimation period to be able to determine the abnormal return in the event window. The estimation period is -165 days to -15 days prior to the merger announcement. They use 15 days prior and after the announcement day as the event window. One quantitative methods that they use is sample paired t-test to test for difference in actual return and expected return. According to [Khan and Ikram \(2012\)](#), the actual return and expected return should be differ within the event period in order to now the possibility to outperform the market. They also aggregate the abnormal returns (excess returns) across securities and over time to see whether there is an immediate jump on the abnormal return around the announcement date or not. This research founds out that the Indian stock market is efficient in semi-strong form. The sample paired t-test shows that there is no difference between the actual return and the expected return. Thus, it is impossible for investors to beat the market. The Aggregation of abnormal returns also shows that there is no positive cumulative abnormal return (cumulative excess return) around the announcement date.

[Gersdorff and Bacon \(2009\)](#) in their paper, “U.S. Mergers and Acquisitions: A Test of Market Efficiency”, also used abnormal return to test the efficiency of the U.S stock market. It analyze the effect of U.S. company mergers and acquisitions announcement on stock price’s risk adjusted rate of return using twenty recent mergers from August 31st, 2007. The results of this findings is that there is evidence that support the semi-strong form market efficiency in the U.S. stock market. Gersdorff and Bacon uses market model on the estimation period to estimate the abnormal returns in the event period. Then, they use paired sample t-test to test if there is a difference between the actual return and the normal return. It turns out that there is no difference which support the efficient market hypothesis in the semi-strong form. They also use the cumulative abnormal return to see the movement of abnormal return around the announcement date.

[Austria \(2013\)](#) tries to find out how the capital market reaction of merger and acquisition announcements by using abnormal returns. The period of study is from year 2006 until 2008. She uses 10 days prior and after the announcement date as the event window. Expected return is calculated using economic model with CAPM which includes the economic condition in calculating the normal return (expected return). After the abnormal returns are calculated,

Wilcoxon Signed Rank Test is being used to determine if there is difference on the abnormal return before and after the announcement. The results shows that the announcement of merger and acquisition significantly affect the investment decisions of market participants. There also an indication that merger announcement are good news for market participants to invest in the stock market.

3. RESEARCH OBJECTIVE

According to the problem identification from the above statement, the objective of this study are as follows:

1. To analyze if the Indonesian stock market is efficient in semi-strong form in the case of merger announcements.
2. To see if there is any difference in stock performance before and after merger announcements.

4. HYPOTHESIS

This research has hypothesis that concern on Indonesian stock market efficiency. Based on research question and research objective, the hypothesis are as follows:

- 0: The Indonesian stock market is efficient in semi-strong form in case of merger announcement.
- 1: The Indonesian stock market is not efficient in semi-strong form in case of merger announcement.
- 0: There is difference in stock performance before and after merger announcement which is measured by Average Abnormal Return in Indonesian stock market.
- 1: There is no difference in stock performance before and after merger announcement which is measured by Average Abnormal Return in Indonesian stock market.

5. DATA AND METHODOLOGY

Daily stock prices and IHSG are used to calculate the abnormal return around the merger announcement date from the year 2000 to 2014. Stock prices and IHSG (known also as the Jakarta Composite Index) are obtained from yahoo finance website (<http://finance.yahoo.com>). Merger announcements date are obtained from Indonesian Capital Market Electronic Library (ICAMEL). The statistics in ICAMEL showed that there are 32 successful merger announcements of public companies from year 2000 to 2014. However, not all of the cases are studied in this research. They are chosen through the following criteria:

- a. The stock price and index price are available in yahoo finance.
- b. The stock price and index price of each firm are available for the duration of the event study, which is -120 to +30
- c. The stocks is actively traded, meaning that there is not much zero returns.

Based on that criteria, table 1 are companies that are chosen for analysis. From 32 companies, 19 companies are taken for study.

Table-1. List of chosen companies

Number	Code	Company Name	Announcement Date
1	IMAS	PT Indosepamas Anggun	30-Jun-02
2	INDR	PT Indo-Rama Synthetics	30-Jun-03
3	IGAR	PT Igar Jaya	12-Dec-03
4	BRPT	PT Barito Pacific	17-Dec-03
5	UNVR	PT Unilever Indonesia	31-Jul-04
6	INPC	Inter Pacific Bank	17-Jun-05
7	SRSN	Sarana Nugraha	05-Oct-05
8	KLBF	Kalbe Farma	16-Dec-05
9	MITI	Siwani Trimitra	24-Apr-06
10	ADES	PT Ades Waters Indonesia	01-Jul-06
11	FREN	PT Mobile-8 Telecom	31-May-07
12	MCOR	PT Bank Windu Kentjana	18-Jan-08
13	BNGA	PT Bank CIMB Niaga	30-Jun-08
14	RMBA	PT Bentoel International Investma	04-Jan-10
15	INPP	PT Indonesian Paradise Property	27-Apr-10
16	NISP	PT Bank OCBC NISP	01-Jan-11
17	TPIA	PT Tri Polyta Indonesia	01-Jan-11
18	SCMA	PT Surya Citra Media	01-May-13
19	EXCL	PT XL Axiata	28-Mar-14

To analyze the efficiency of Indonesian stock market in case of successful merger announcements, event study method is being used. According to [Bodie *et al.* \(2011\)](#), event study is an empirical research technique that can see the effect of a particular event on a firm's stock price. Event study uses abnormal return over the event window to test for market efficiency. An abnormal return, which implies as the difference between actual return and expected return, will be positive or negative depends on the information if the market is not efficient. In an efficient market, it is not possible to find abnormal returns because it is impossible for investors to earn excess return. As describe before, there are many approach to find abnormal return. In this research statistical model of market model will be used. The steps of conducting event study are as follows:

1. The first step is to define the event and the event window. The event in this research is announcements of successful merger from year 2000 to 2014. Announcements of successful mergers are categorized as a positive news which will make the stock prices to increase after the announcement. The event window is 30 days prior and after the announcement day (-30 to +30). Since market model is used, there is a need to establish estimation window as well. The estimation window differ between companies depend on the availability of the data. Some use 210 days prior to the event window and some use 90 days prior to the event window. Figure 1 depict the timeline of event window which uses day -240/-120 to -30 as the estimation window.

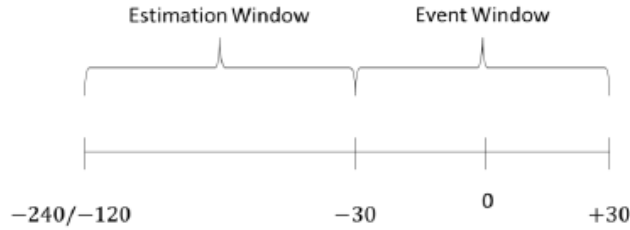


Figure-1. Timeline used for event study

2. Gather the daily historical prices of stocks and IHSG from yahoo finance and calculate the daily stock return (R) and daily market return (R_m). The returns of each stocks along the estimation and event window is calculated using the formula below:

$$R_{it} = \ln(1 + R_t) = \ln \frac{P_{it}}{P_{it-1}}$$

Where R_{it} is the return of stock i at day t, P_{it} and P_{it-1} is the closing price of stock i at day t and the closing price of stock i at day t-1. Next is to calculate the market return using IHSG daily price. The corresponding market return is also calculated along the estimation and event window using the formula:

$$R_{mt} = \ln(1 + R_{mt}) = \ln \frac{P_{mt}}{P_{mt-1}}$$

Where R_{mt} is the market return at day t, P_{mt} and P_{mt-1} is the closing price of market return at day t and closing price of market return at day t-1.

3. A regression analysis is conducted using the actual daily return of each stock (R) as dependent variable and the corresponding daily market return (R_m) of IHSG as independent variable over the estimation window (some stock uses 90 days prior to the event window and some uses 210 days prior to the event window) to obtain the intercept alpha and slope beta for each stock separately. Table 2 shows alpha, beta, and estimation period that is used for each stocks.

4. Calculate the expected return of each stock for each day during the event window (day -30 to +30) using the formula:

$$\hat{R}_{it} = \hat{\alpha}_i + \hat{\beta}_i R_{mt}$$

Where \hat{R}_{it} is the expected return on stock I at time t and R_{mt} is the corresponding market return i.e. IHSG. Then, the Abnormal Return is calculated as:

$$AR_{it} = R_{it} - \hat{R}_{it}$$

Where R_{it} is the actual return on stock i at time t. the next step is aggregating the abnormal returns across stocks and over time during the event window.

5. Average Abnormal Return (AAR) is the average of abnormal return of all stocks at time t during the event window. AAR is calculated each day using the formula:

$$\overline{AR}_t = \frac{1}{N} \sum_{i=1}^N AR_{it}$$

Where N is the number sample companies. In this research the N is 19.

6. Cumulative Average Abnormal Return (CAAR) is calculated by adding AAR for each day from -30 to +30 or simply describe in the following formula:

$$\overline{CAR}(t_1, t_2) = \sum_{t=t_1}^{t_2} \overline{AR}_t$$

Table-2. Alphas, Betas, and estimation period of each stocks

Code	Alpha	Beta	Estimation window
SCMA	0.001964	0.106163	210
TPIA	0.000166	0.524556	210
NISP	0.001758	0.24393	210
RMBA	0.00024	0.380218	210
MITI	-0.00047	0.105069	210
INPP	0.000455	-0.32017	90
BNGA	-0.00105	1.210479	210
FREN	-0.00148	1.057271	90
MCOR	-0.00397	0.86012	90
ADES	-0.00117	1.015818	210
KLBF	-0.00016	1.10974	210
SRSN	0.001036	0.530258	210
INPC	0.001103	1.635667	210
UNVR	0.000506	0.762795	90
IGAR	0.000454	1.540521	210
BRPT	0.004915	1.332116	210
INDR	-0.00011	0.709932	210
IMAS	0.00123	0.123966	90
EXCL	-0.00047	0.644648	210

7. To see the movement of aggregated Abnormal return across stocks and over time, CAAR and AAR is then plotted through time during the event window (day-30 to +30).

8. To test for market efficiency, a number of parametric and non-parametric test is used, such as the paired sample T-test, one sample T-test, Wilcoxon matched-pairs signed-rank test and Wilcoxon signed-rank test. Non-parametric test serves as a conjunction to parametric tests. Inclusion of non-parametric test provides a check of robustness of the conclusion that is made by performing parametric test because non-parametric tests are more relaxed to the statistical assumptions especially normality assumptions. However, if assumptions are met, parametric test is a very strong test to use.

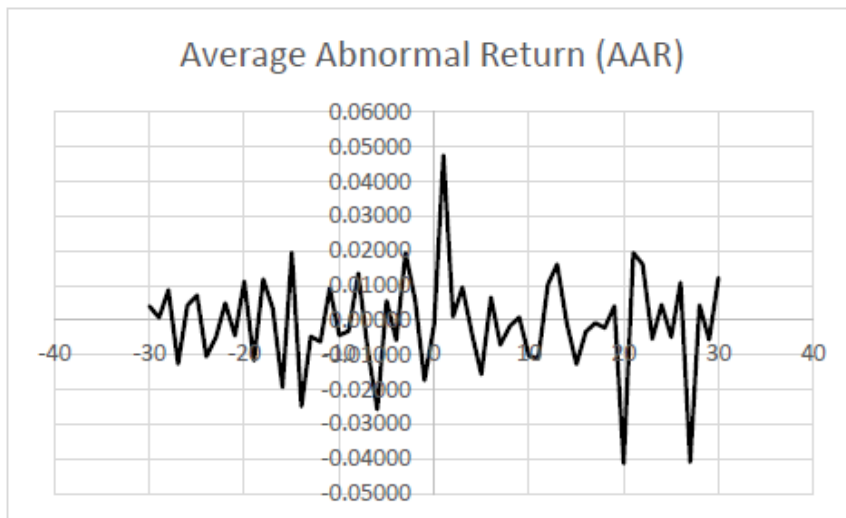
6. QUANTITATIVE ANALYSIS TEST AND RESULTS

After AAR is calculated, statistical test is conducted to see the significance of AAR each day during the event window. First, Parametric test is conducted which uses one-sample T-test. This test assumes the null hypothesis that the mean of abnormal returns at time t is equal to zero. To support the conclusion made by parametric test, non-parametric test is also conducted. As describe before, non-parametric test is more relaxed to the statistical assumptions especially normality assumptions. For non-parametric test, Wilcoxon signed-rank test is used under the null hypothesis that states the AAR at time t is equal to zero. Table 3 shows Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR) together with the T-value and Z-value which is obtained from conducting one-sample T-test and Wilcoxon signed-rank test. Graph 2 shows the relationship Average Abnormal Return (AAR) to time and graph 3 shows the relationship of Cumulative Average Abnormal Return (CAAR) to time during the event window (day -30 to +30 days).

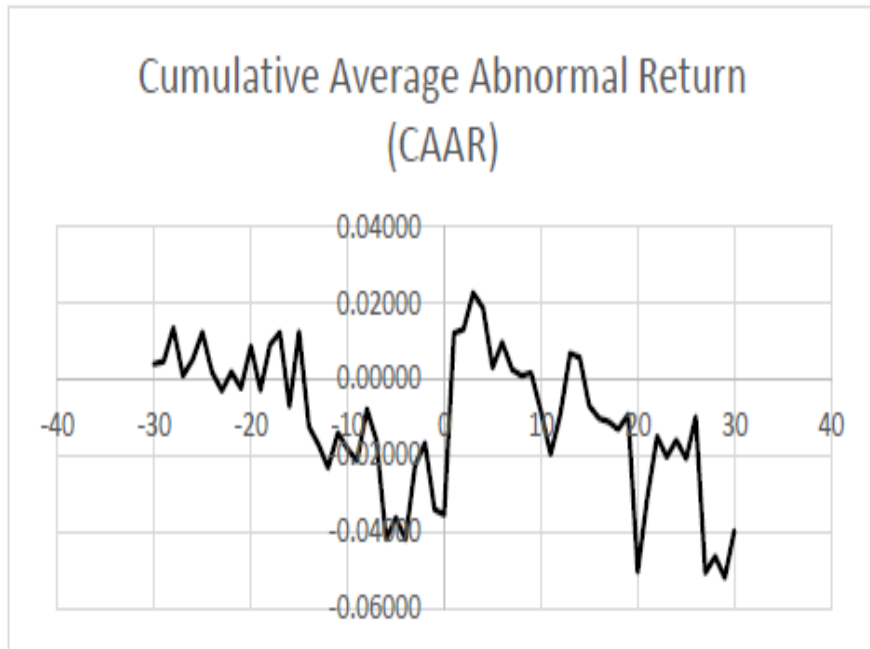
Table-3. Results of Average Abnormal Return, Cumulative Average Abnormal Return, and statistical tests.

Day	Average Abnormal Return (AAR)	Cumulative Average Abnormal Return (CAAR)	T-value	Z-value
-30	0.00405	0.00405	0.39026	-0.362
-29	0.00075	0.00480	0.08866	-0.161
-28	0.00878	0.01358	1.17451	0.926
-27	-0.01255	0.00103	-1.21075	-1.328
-26	0.00422	0.00525	0.56288	0.926
-25	0.00715	0.01239	0.74550	0.443
-24	-0.01041	0.00199	-1.21650	-1.328
-23	-0.00489	-0.00290	-1.31461	-1.69
-22	0.00493	0.00203	0.78804	0.885
-21	-0.00437	-0.00234	-0.47093	-0.322
-20	0.01112	0.00877	1.03140	0.845
-19	-0.01157	-0.00280	-1.66243	-1.529
-18	0.01187	0.00907	1.62568	0.644
-17	0.00326	0.01233	0.45508	-0.201
-16	-0.01931	-0.00698	-1.52368	-2.455
-15	0.01951	0.01253	1.97603	1.368
-14	-0.02481	-0.01228	-1.05696	0
-13	-0.00472	-0.01700	-0.45447	-1.167
-12	-0.00614	-0.02314	-0.81967	-0.644
-11	0.00920	-0.01394	1.41017	0.885
-10	-0.00428	-0.01821	-0.85302	0.04
-9	-0.00312	-0.02133	-0.24145	-0.443
-8	0.01350	-0.00784	0.75933	1.046
-7	-0.00814	-0.01598	-0.95981	-2.536
-6	-0.02576	-0.04173	-2.26576	-2.656
-5	0.00557	-0.03616	0.36455	-0.121
-4	-0.00574	-0.04190	-0.38407	0.362
-3	0.01940	-0.02250	1.14713	0.402
-2	0.00581	-0.01669	0.44664	0.724
-1	-0.01739	-0.03408	-1.87182	-1.73
0	-0.00133	-0.03540	-0.10012	-0.08
1	0.04756	0.01216	0.83622	-0.282

2	0.00105	0.01321	0.09645	-0.523
3	0.00951	0.02272	0.37322	-0.121
4	-0.00403	0.01869	-0.37061	-0.161
5	-0.01561	0.00308	-1.86610	-1.569
6	0.00660	0.00968	0.67095	0.483
7	-0.00704	0.00264	-0.74043	-0.684
8	-0.00172	0.00092	-0.27620	-0.121
9	0.00087	0.00179	0.08614	-0.644
10	-0.01035	-0.00856	-1.06955	-0.523
11	-0.01106	-0.01961	-1.39291	-1.288
12	0.01027	-0.00935	0.97164	1.087
13	0.01611	0.00677	1.31036	0.604
14	-0.00092	0.00584	-0.05519	0.523
15	-0.01272	-0.00688	-1.36178	-1.046
16	-0.00330	-0.01018	-0.28806	-0.443
17	-0.00085	-0.01103	-0.06790	-0.04
18	-0.00213	-0.01316	-0.19066	0.644
19	0.00406	-0.00911	0.61416	-0.04
20	-0.04132	-0.05042	-2.51833	-2.294
21	0.01940	-0.03102	1.49132	-0.483
22	0.01610	-0.01492	1.67161	1.087
23	-0.00541	-0.02033	-1.06859	-0.966
24	0.00447	-0.01586	0.66473	-0.121
25	-0.00479	-0.02066	-0.66533	-1.207
26	0.01086	-0.00979	0.60223	-0.04
27	-0.04089	-0.05068	-1.53464	-1.207
28	0.00432	-0.04636	0.69247	0.322
29	-0.00557	-0.05193	-0.34004	-0.966
30	0.01225	-0.03967	1.24477	0.926



Graph-2. Shows the relationship of AAR to time during the event period (day -30 to +30)



Graph-3. Shows the relationship of CAAR to time during the event period (day -30 to +30)

The results shows that there is only a few AAR that is significant in 10% level of significance using parametric and non-parametric test. To see the effect of merger announcements to abnormal return, we might be interested in the AAR at day zero which is the announcement day and days after the announcement. In graph 2, we can see that the abnormal return is moving randomly and there is an immediate jump on the announcement day (day 0) and the day after. Based on the graph there is a possibility of shareholders to earn abnormal return. However, based on the statistical test there are no AAR that is significance on and after the announcement day except for day 5 but it shows a negative number where we expect to be positive since merger announcements is categorized as a positive news. The movement in AAR is reflected in graph 3. It shows the tendency of Average Abnormal Return movement. After the announcement day, there is more negative AAR which is showed by the declining pattern in CAAR. Based on hypothesis testing on AAR each day, we can conclude that the market is efficient because the presence of abnormal return around the announcement day is not significant.

To support the conclusion of one sample statistical test that is conducted before, it is important also to test for the presence of abnormal return in each stock around the announcement day. Paired sample statistical tests is conducted to see the presence of abnormal return. In this part of test, event window is narrowed to 15 days prior and after the announcement day to identify the presence of abnormal return closely around the announcement day. Actual and expected return within the narrowed event window should differ in order to know the possibility to outperform the stock market in the case of merger announcements. Again, parametric and non-

parametric test is used within the narrowed event period. In the case of merger announcement, shareholders will expect to gain on their investment after the announcement day. Therefore, a test of difference in actual return and expected return on the announcement day to 15 days after the announcement day is also conducted to see if shareholders could earn excess return. First, Jarque-Barra test of normality is conducted to see how the data are distributed. This test assumes that the data is normally distributed under the null hypothesis. Normal data is best to be observed using parametric test. In the other hand, non-normal data is best to use non-parametric test because the distributional assumption is more relaxed if using non-parametric tests. However, in this research both parametric and non-parametric test will be applied to normal and non-normal data to act as a comparison and for stronger conclusion. As describe before, non-parametric test is serve as a conjunction to parametric test, it support the conclusion that is made after conducting parametric test. Paired sample T-test is used as parametric method and Wilcoxon matched-pairs signed-rank test is used as non-parametric method. Both of this test have the null hypothesis of expected return is the same as actual return which make it impossible to outperform the market. Table 4 shows the result of normality test, paired sample t-test and Wilcoxon matched-pairs signed-rank test during the narrowed event window.

Table-4. Results of paired sample statistical test on the actual return and expected return during the narrowed event window (-15 to +15).

Code	Normality (P-value)		Mean Differece	Paired sample t-test		Wilcoxon signed-rank test	
	Actual	Expected		t -Value	P-Value	z -Value	P-Value
SCMA	0.0014	0.3453	-0.0004	0.1472	0.8835	0.6717	0.5018
TPIA	0.0059	0.2704	0.0043	1.4262	0.1590	1.0450	0.296
NISP	0.021	0.2704	-0.0058	1.4711	0.1465	1.9213	0.0547
RMBA	0.0146	0.018	-0.0070	0.6864	0.4951	1.4905	0.1361
MITI	0.9925	0	-0.0070	0.7726	0.4428	0.7793	0.4358
NIPP	0	0.0076	0.0059	0.6110	0.5435	2.1876	0.0287
BNGA	0	0.0854	0.0073	1.9287	0.0585	1.7991	0.072
FREN	0.0005	0.5275	0.0007	0.2150	0.8305	0.4705	0.638
MCOR	0.0023	0.002	0.0031	0.4466	0.6568	0.7218	0.4704
ADES	0.0009	0.0147	-0.0015	0.2592	0.7964	0.1401	0.8886
KLBF	0	0.702	0.0113	1.4438	0.1540	0.8727	0.3828
SRSN	0	0.0404	0.0126	0.6453	0.5212	0.4705	0.638
INPC	0.8245	0.817	-0.0126	1.2888	0.2024	1.5552	0.1199
UNVR	0.254	0.1251	-0.0037	2.1149	0.0386	1.7991	0.072
IGAR	0.7369	0.7812	-0.0066	1.6489	0.1044	1.6415	0.1007
BRPT	0.1146	0.7828	-0.0094	2.3801	0.0205	2.6693	0.0076
INDR	0.0611	0.8572	-0.0034	1.0333	0.3056	1.0307	0.3027
IMAS	0	0.9499	-0.0034	0.2909	0.7721	1.1888	0.2345
EXCL	0.0416	0.0136	0.0015	0.5479	0.5858	0.3914	0.6955

Using parametric test, there are only three companies that have significant difference in actual and expected return using 10% level of significance. Those companies are BNGA, UNVR,

and BRPT. From three of them, only two of them are significant in 5% level of significance which are UNVR and BRPT. Using Non-parametric test, there are 5 companies that are significant in 10% level of significance. Those companies are NISP, NIPP, BNGA, UNVR and BRPT. From 5 of those companies, there are two companies that are significant at 5% level of significance, which are NIPP and BRPT. Parametric test and non-parametric test both identify BNGA, UNVR, and BRPT to have a difference in actual and expected return from day -15 to +15, making investors investing in those companies are possible to beat the market. Table 5 shows the result of normality test, paired sample t-test and Wilcoxon matched-pairs signed-rank test after the announcement day where day zero is included.

Table-5. Results of paired sample statistical test on the actual return and expected return after the announcement day (0 to +15).

Code	Normality (P-Value)		Mean Difference	Paired sample t-test		Wilcoxon signed-rank test	
	Actual	Expected		T -Value	P-Value	z -Value	P-Value
SCMA	0.6275	0.2892	0.0012	0.2570	0.8007	0.2069	0.8361
TPIA	0.0112	0.5637	0.0088	1.2039	0.2473	1.0860	0.2775
NISP	0.0126	0.5637	-0.0156	1.7030	0.1092	1.4997	0.1337
RMBA	0.0046	0.1526	0.0012	0.0748	0.9414	0.8274	0.408
MITI	0.2038	0.0005	-0.0119	0.5708	0.5766	0.2585	0.796
NIPP	0.0934	0.679	0.0236	2.7770	0.0141	2.2751	0.0229
BNGA	0.0005	0.3859	0.0030	0.5251	0.6072	0.6205	0.5349
FREN	0.9536	0.3109	-0.0056	1.0343	0.3174	0.9307	0.352
MCOR	0.4794	0.2634	-0.0088	0.4111	0.6868	0.3619	0.7174
ADES	0.0813	0.2462	0.0037	0.3383	0.7398	0.2585	0.796
KLBF	0	0.8418	0.0303	1.1364	0.2736	0.9307	0.352
SRSN	0	0.2282	0.0556	0.8347	0.417	0.1035	0.9176
INPC	0.6346	0.8712	-0.0234	1.0074	0.3297	0.8274	0.408
UNVR	0.0519	0.5724	-0.0059	1.7491	0.1007	1.6546	0.098
IGAR	0.8325	0.9978	-0.0122	1.6329	0.1233	1.4997	0.1337
BRPT	0.2105	0.813	-0.0109	1.6737	0.1149	1.4477	0.1477
INDR	0.5552	0.9334	-0.0011	0.1752	0.8633	0.1035	0.9176
IMAS	0.941	0.4859	-0.0100	0.6683	0.5141	0.9307	0.352
EXCL	0.8246	0.0039	0.0086	2.0808	0.055	1.6546	0.098

Both Parametric and non-parametric test states that there is a significant difference in actual return and expected return in 10% level of significance in NIPP, UNVR and EXCL. NIPP is also significant in 5% level of significance. This results shows that shareholders are able to earn excess abnormal return in stocks NIPP, UNVR and EXCL.

Table 4 and 5 shows that merger announcements does not have significant effect on the performance of the stock price, which is represent by abnormal return. Within the narrowed event window, there are only three companies that are significant using parametric test and five companies that are significant using non-parametric test. But, these companies that is identified to be significant in table 4 may not be in the case of merger announcements, it could be other events regarding the prospect of the company. To identify the real effect of merger announcement, the focus is more on table 5, which represent the ability of investors to earn abnormal return after the announcements of mergers. If the market is not efficient, it is possible for investors to earn

abnormal return after the announcement day. Table 5 shows that the market is efficient because there are only 2 stocks from 19 stocks being analyze where the shareholders are able to earn abnormal return. The two statistical tests, one sample and paired statistical test, 0: Therefore we conclude that Indonesian stock market is efficient in semi-strong form in case of merger announcement. To see whether there is a difference in stock performance before and after the announcement day during the event window, two independent sample parametric and non-parametric statistical test is used. This test is performed to find out the second hypothesis of this research. Two independent samples t-test and Mann-Whitney test are both conducted after a test of normality is performed using Jarque-Barra test. Both of the data are normally distributed using 5% level of significance but the after data is appeared to be not normal using 10% level of significance. Both parametric and non-parametric test indicates that there is no significant difference in stock performance before and after the announcement day. P-value from T-test and Mann-Whitney are 0.790 and 0.7117 which are above 5%. Thus, we cannot reject the null hypothesis that the Average Abnormal Return (AAR) before and after the announcement day is equal. Table 6 shows the result of parametric and non-parametric tests and also provides additional information about the normality of the data.

Table-6. The result of tests of the difference in abnormal return before (day -30 to -1) and after (day +1 to +30) the announcement day

Period	P-Value	Mean Difference	Parametric test (t test of independent data)		Non-Parametric test (Mann-Whitney test)	
			T-value	P-value	z- value	P-value
Before	0.695	-0.000994	-0.268	0.790	-0.370	0.7117
After	0.0576					

1: There is no difference in stock performance before and after merger announcement which is measured by Average Abnormal Return (AAR) in Indonesian stock market which may be due to the efficiency of Indonesian stock market.

7. CONCLUSION

Generally shareholders and investors will view announcement of successful merger as something positive. This study has empirically examined the efficiency of Indonesian stock market in case of merger announcement. After testing, the research shows that the possibility of shareholders gaining abnormal return cannot be realized with public information especially successful merger announcement. The research proved that the Indonesian stock market is efficient in semi strong form. And due to the fact that Indonesian stock market are efficient in semi-strong form, this study also examined that there is no difference in stock performance before and after the announcement day because in efficient market it is impossible for investors to outperform the market at any time.

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