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Analysis of Size Effect Anomaly in the Indonesian Stock Exchange: A Study of L-45 Companies for the Period of 2015-2017

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Abstract

The purpose of this study is to analyze the difference in average stock returns between large-sized companies (SBB) and small-sized companies (SBK) in the Indonesian Stock Exchange, focusing on the LQ-45 companies during the period of 2015-2017. The company size is proxied using the market capitalization approach. The analytical tools employed in this research include descriptive analysis, normality test, and paired sample t-test. The research conducted during the period of 2015-2017 reveals that significant differences exist between the returns of large-sized companies (SBB) and small-sized companies (SBK) in the first semester of 2015, first semester of 2016, first semester of 2017, and second semester of 2017. However, no differences in returns between large-sized companies (SBB) and small-sized companies (SBK) are observed in the second semester of 2015 and second semester of 2016.

Keywords: *Anomaly, Market Anomalies, Size Effect, Stock Return*

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1. Introduction

The existence of the capital market is a crucial means for both companies and investors. Investors, as fund owners, utilize the capital market as one of their investment alternatives. Macro and micro information are highly essential for investors in making decisions to buy or sell stocks. An efficient capital market reacts quickly to new information, leading to a rapid attainment of a new equilibrium price. However, when certain predictable patterns or changes occur within a specific time frame, the market is said to experience anomalies. There are several anomalies known in finance, namely the size effect anomaly, E/P ratio anomaly, and January effect anomaly (Hanafi, 2009:318). In terms of the size effect anomaly, several studies have been conducted. Kurniawan and Purbawangsa (2018) examined the size effect anomaly and the day of the week anomaly in the Indonesian Stock Exchange, which resulted in the finding that firm size does not affect stock returns. This is because small-sized companies provide higher returns compared to large-sized companies. Ramel Yanuarta RE (2012) investigated the size effect anomaly in the Indonesian Stock Exchange using two approaches: market capitalization and total assets. Stock grouping based on market capitalization yielded contradictory estimations with the size effect anomaly. On the other hand, the approach based on total assets demonstrated results consistent with the size effect anomaly, as portfolios of small-sized companies' stocks generated higher returns compared to portfolios of large-sized companies' stocks. Banz, R (1981) examined the relationship between stock returns and market value. The results showed that companies with larger market capitalization have lower returns compared to companies with smaller market capitalization.

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1.1. Market Efficiency

In the concept of efficient markets, past price changes of securities cannot be used to predict future price changes. Stock price changes in efficient markets follow a random walk pattern. Information entering the market and related to a security can result in the possibility of a new equilibrium price shift.

Belkaoui (2007:139) summarizes several definitions related to market efficiency from experts:

- Fama (1970) argues that in an efficient market, prices fully reflect all available information, and as a result, prices will react instantaneously without bias towards new information.
- Beaver (1989) defines market efficiency as the relationship between stock prices and the availability of information.

Tandelilin (2010:219) defines an efficient market as a market where traded security prices reflect all available information.

From various existing definitions, the concept of market efficiency is closely related to the availability of information, which results in securities prices being at their equilibrium levels and eliminating opportunities for investors to obtain abnormal returns from price differences.

Fama (1970) classified market efficiency into three forms to facilitate research on market efficiency (Tandelilin, 2010:223). In 1991, Fama made refinements to this classification. The weak form of market efficiency was expanded to a more general classification to test return predictability.

In this classification, information about securities' return patterns, such as higher returns in January and on Fridays, is exploited by investors to gain abnormal profits. On the other hand, the semi-strong form of efficiency was transformed into event studies, and testing market efficiency in its strong form is referred to as testing private information.

1.2. Efficient Market Hypotesis

Testing the efficient market hypothesis can be divided into three groups based on the classification of the efficient market hypothesis. According to Reilly (2000; 179), these tests are as follows:

- The efficient capital market hypothesis in its weak form can be tested through return predictability tests, which include testing return patterns (daily, weekly, and monthly) and testing the relationship between returns and company characteristics. In this test, abnormal returns related to company characteristics such as size, market-to-book value, and earnings ratio are examined.
- The efficient capital market hypothesis in its semi-strong form can be examined through event studies, which aim to observe stock price changes in response to new information.

The efficient capital market hypothesis in its strong form can be tested through private information testing.

1.3. Market Anomalies

Market anomalies exist in all forms of efficient markets, including weak, semi-strong, and strong forms. According to Jones (2014:311), market anomalies are techniques and strategies that appear to contradict the concept of an efficient market. Several anomalies are known in finance, namely the size effect anomaly, the E/P ratio anomaly, and the January effect anomaly

(Hanafi, 2009:318). A market is said to experience an anomaly when, at a certain time, there is the formation and repetition of patterns or predictable changes. Anomalies enable investors to make predictions as stock prices exhibit patterns at specific times, no longer moving randomly or randomly.

Among all the discovered anomalies, one that has garnered considerable attention is the size effect anomaly. Consistently, small-cap stocks have higher returns compared to large-cap stocks. Such a finding seems to contradict market efficiency because investing in small-cap stocks would yield excess returns for investors. The explanation lies in the differential transaction costs, where small-cap companies bear higher transaction costs compared to large-cap companies. With these higher transaction costs, the excess returns from small-cap stocks would diminish (Hanafi, 2009:318).

1.4. Size Effect

The size effect is the result of testing abnormal returns associated with company characteristics. The existence of abnormal returns signifies anomalies in the capital market. Anomalies, in general, refer to deviations from existing equilibrium models (Bodie et al., 2009; 361). In an equilibrium model, stock returns are expected to be proportional to the risk inherent in the stock. Stock returns will change if the risk premium or its sensitivity changes. If there are no changes, then there will be no changes in the stock price (return) of the company.

The size effect anomaly has been proven universally in several foreign studies (Banz, 1981 in America, Cook and Rozeff, 1984 in Belgium, Canada, France, Xu, 2002 in China, Sehgal and Tripathi, 2004 in India, etc.). According to Asnawi and Wijaya (2005; 180), this phenomenon is related to deviations from the Capital Asset Pricing Model (CAPM) equilibrium model. In CAPM, the sensitivity of a stock is measured against the market, resulting in the concept of stock beta. A high beta value (sensitivity) indicates higher risk as well. When beta in CAPM cannot explain the return difference of a stock, that is what is referred to as an anomaly, one of which is the size effect.

According to Jones (2014:327), the size effect anomaly was first discovered by Banz (1981) in the American capital market and further supported by Reinganum (1981). Banz found an inverse (negative) relationship between company size and stock returns. It means that small-cap stocks provide higher returns compared to large-cap stocks. This phenomenon contradicts the concept of an efficient market, where no information should enable market participants to obtain higher returns.

With the presence of this size effect anomaly, market participants can utilize portfolio selection strategies consisting of small-cap stocks to achieve higher returns (outperform).

2. Methods

2.1. Model Development

The population of this research consists of 45 companies each semester listed in the Indonesia Stock Exchange (BEI) under the LQ-45 during the period 2015-2017. The composition of the LQ-45 companies undergoes changes as some companies join while others exit. Table 1 presents the data on the companies that joined and exited each semester during the period 2015-2017.

Table 1. The companies that entered and exited the LQ-45 index during the period 2015-2017

	Year	Joined	Exited
2015	1st Semester	MPPA,SILO, SSMS	BDMN, HRUM, TAXI
	2nd Semester	SRIL ,WTON	ANTM ,CTRA
2016	1st Semester	ANTM, HMSP, MYRX	EXCL, ITMG, WTON
	2nd Semester	ELSA	TBIG
2017	1st Semester	BUMI, EXCL, PPRO	BMTR, MPPA, SILO
	2nd Semester	BJBR, BMTR, BRPT	ASRI, CPIN, ELSA

The data used in this study is secondary data, which includes the names of the companies, market capitalization, and individual stock returns of the companies included in the LQ-45 during the period 2015-2017. The data were obtained from the Indonesia Stock Exchange website (https://idx.co.id) and Finance Yahoo website (https://finance.yahoo.com).

2.1.1. Measures

The research variables used are as follows:

Stock Return

Stock return is the result obtained from stock investments. The formula to calculate the individual stock return value is as follows (Hartono, 2013:206):

$$Rt(i) = \frac{(Pt - Pt-1)}{Pt-1}$$

Company Size

Company size is divided into two categories: large company size (LC) and small company size (SC), measured by the proxy of market capitalization. Market capitalization is the market value given to a company, obtained by multiplying the stock price at that time by the number of shares outstanding. Market capitalization is measured using the following formula (Wikihow, 2016):

Vs = Ps x Ss

Then, market capitalization is categorized into two groups: companies with market capitalization above IDR 40 trillion are classified as large companies (LC), and those with market capitalization below IDR 40 trillion are classified as small companies (SC) (Yocelyn and Christiawan, 2013).

2.1.2. Hypothesis

H1. There is a difference in the average returns of large-cap (LC) and small-cap (SC) LQ-45 companies during the period 2015-2017.

H2. There is a difference in the average returns of large-cap (LC) and small-cap (SC) LQ-45 companies in each semester during the period 2015-2017*H2 : variable 1 affects variable 2*

2.2. Data Collection

The data used in this study is secondary data, which includes the names of the companies, market capitalization, and individual stock returns of the companies included in the LQ-45 during the period 2015-2017. The data were obtained from the Indonesia Stock Exchange website (https://idx.co.id) and Finance Yahoo website (https://finance.yahoo.com).

2.3. Analysis Methods

2.3.1. Descriptive Analysis

The descriptive analysis used in this research is the average value of individual stock returns that joined the LQ-45 during the period 2015-2017.

2.3.2. Data Analysis Assumptions Test

The data analysis assumptions test uses the normality test. The normality test is conducted to determine whether the variation of the data used follows a normal distribution or not. In this research, the normality test of data is conducted using the Kolmogorov-Smirnov test. The criteria are as follows (Ghozali, 2011:32):

- If the probability value or significance value of K-S < 0.05, then the data distribution is not normal.
- If the probability value or significance value of K-S > 0.05, then the data distribution is normal.

2.3.3. Quantitative Analysis

The analysis technique used in this research is the Paired Sample t-test, using the SPSS program (Statistical Package for Social Science). The Paired Sample t-test is a parametric analysis. Therefore, this test requires that the data be normally distributed (Prayitno Duwi, 2012:11). The decision-making criteria are as follows:

- If the significance value of t > 0.05, then H0 is accepted, and Ha is rejected, indicating that there is no significant difference.
- If the significance value of t ≤ 0.05, then H0 is rejected, and Ha is accepted, indicating that there is a significant difference.

3. Result

3.1. Descriptive Analysis

3.1.1. Company Returns Period 2015-2017

Table 2 shows the returns of LQ-45 companies during the period 2015-2017. The average return of large companies (LC) is 0.008407 with a standard deviation of 0.0331234, while the average return of small companies (SC) is -0.004894 with a standard deviation of 0.0473906.

The minimum return of large companies (LC) during the period 2015-2017 is -0.0690, achieved by PT PGAS in the second semester of 2015, while the maximum return of large companies (LC) in the period 2015-2017 is 0.1185, achieved by PT ICBP in the second semester of 2015.

The minimum return of small companies (SC) during the period 2015-2017 is -0.1212, achieved by PT ANTM in the first semester of 2015, while the maximum return of small

Table 2. Descriptive Statistics of Stock Returns Period 2015-2017

	N	Minimum	Maximum	Mean	Std. Deviation
LC	113	-.0690	.1185	.008407	.0331234
SC	157	-.1212	.1810	-.004894	.0473906
Valid N (listwise)	113				

Table 3. Descriptive Statistics of Stock Returns Year 2015 Semester 1

	N	Minimum	Maximum	Mean	Std. Deviation
LC	19	-.0669	.0241	-.018079	.0244837
SC	26	-.1212	.0412	-.031542	.0447908
Valid N (listwise)	19				

Table 4. Descriptive Statistics of Stock Returns Year 2015 Semester 2

	N	Minimum	Maximum	Mean	Std. Deviation
LC	18	-.0690	.1185	.013444	.0458812
SC	27	-.1066	.0524	-.017137	.0432493
Valid N (listwise)	18				

companies (SC) during the period 2015-2017 is 0.1810, achieved by PT ANTM in the first semester of 2016.

3.1.2. Company Returns Year 2015 Semester 1

Table 3 shows that the average return of large companies (LC) is -0.018079 with a standard deviation of 0.0244837, while the average return of small companies (SC) is -0.031542 with a standard deviation of 0.0447908.

The minimum return of large companies (LC) in year 2015 semester 1 is -0.0669, achieved by PT CPIN, while the maximum return of large companies (LC) is 0.0241, achieved by PT LPPF.

The minimum return of small companies (SC) in year 2015 semester 1 is -0.1212, achieved by PT ANTM, while the maximum return of small companies (SC) is 0.0412, achieved by PT SSMS.

3.1.3. Company Returns Year 2015 Semester 2

Table 4 shows the returns of companies in year 2015 semester 2. It can be observed that the average return of large companies (LC) in year 2015 semester 2 is 0.013444 with a standard deviation of 0.0458812, while the average return of small companies (SC) in year 2015 semester 2 is -0.017137 with a standard deviation of 0.0432493.

Table 5. Descriptive Statistics of Stock Returns Year 2016 Semester 1

	N	Minimum	Maximum	Mean	Std. Deviation
LC	19	-.0260	.0643	.020216	.0258259
SC	26	-.0265	.1810	.044727	.0556808
Valid N (listwise)	19				

Table 6. Descriptive Statistics of Stock Returns Year 2016 Semester 2

	N	Minimum	Maximum	Mean	Std. Deviation
LC	20	-.0451	.0858	-.000390	.0301433
SC	25	-.0781	.0373	-.015904	.0295476
Valid N (listwise)	20				

Table 7. Descriptive Statistics of Stock Returns Year 2017 Semester 1

	N	Minimum	Maximum	Mean	Std. Deviation
LC	19	-.0396	.0559	.016689	.0264960
SC	26	-.0743	.0792	-.003815	.0366143
Valid N (listwise)	19				

Table 4 reveals that the minimum return of large companies (LC) in year 2015 semester 2 is -0.0690, found in PGAS, while the maximum return of large companies (LC) is 0.1185, found in PT ICBP.

The minimum return of small companies (SC) in year 2015 semester 2 is -0.1066, achieved by PT ITMG, while the maximum return of small companies (SC) is 0.0524, achieved by PT ADHI.

3.1.4. Company Returns Year 2016 Semester 1

Table 5 shows the returns of companies in year 2016 semester 1. It can be observed that the average return of large companies (LC) in year 2016 semester 1 is 0.020216 with a standard deviation of 0.0258259, while the average return of small companies (SC) in year 2016 semester 1 is 0.044727 with a standard deviation of 0.0556808.

Table 5 reveals that the minimum return of large companies (LC) in year 2016 semester 1 is -0.0260, achieved by PT SMGR, while the maximum return of large companies (LC) is 0.0643, achieved by PT PGAS.

The minimum return of small companies (SC) in year 2016 semester 1 is -0.0265, achieved by PT SSMS, while the maximum return of small companies (SC) is 0.1810, achieved by PT ANTM.

Table 8. Descriptive Statistics of Stock Returns Year 2017 Semester 2

	N	Minimum	Maximum	Mean	Std. Deviation
LC	18	-.0387	.0617	.019894	.0273732
SC	27	-.0690	.0711	-.005615	.0339604
Valid N (listwise)	18				

3.1.5. Company Returns Year 2016 Semester 2

Table 6 shows the returns of companies in year 2016 semester 2. It can be seen that the average return of large companies (LC) in year 2016 semester 2 is -0.000390 with a standard deviation of 0.0301433, while the average return of small companies (SC) in year 2016 semester 2 is -0.015904 with a standard deviation of 0.0295476.

Table 6 shows that the minimum return of large companies (LC) in year 2016 semester 2 is -0.0451, achieved by PT LPPF, while the maximum return of large companies (LC) is 0.0858, achieved by PT ADRO.

The minimum return of small companies (SC) in year 2016 semester 2 is -0.0781, achieved by PT BMTR, while the maximum return of small companies (SC) is 0.0373, achieved by PT SILO.

3.1.6. Company Returns Year 2017 Semester 1

Table 7 shows the returns of companies in year 2017 semester 1. It can be observed that the average return of large companies (LC) in year 2017 semester 1 is 0.016689 with a standard deviation of 0.0264960, while the average return of small companies (SC) in year 2017 semester 1 is -0.003815 with a standard deviation of 0.0366143.

Table 7 reveals that the minimum return of large companies (LC) in year 2017 semester 1 is -0.0396, achieved by PT PGAS, while the maximum return of large companies (LC) is 0.0559, achieved by PT UNTR.

The minimum return of small companies (SC) in year 2017 semester 1 is -0.0743, achieved by PT ELSA, while the maximum return of small companies (SC) is 0.0792, achieved by PT SRIL.

3.1.7. Company Returns Year 2017 Semester 2

Table 8 shows the returns of companies in year 2017 semester 2. It can be seen that the average return of large companies (LC) in year 2017 semester 2 is 0.019894 with a standard deviation of 0.027373, while the average return of small companies (SC) in year 2017 semester 2 is -0.005615 with a standard deviation of 0.0339604.

Table 8 shows that the minimum return of large companies (LC) in year 2017 semester 2 is -0.0387, achieved by PT PGAS, while the maximum return of large companies (LC) is 0.0617, achieved by PT BBNI.

The minimum return of small companies (SC) in year 2017 semester 2 is -0.0690, achieved by PT LPKR, while the maximum return of small companies (SC) is 0.0711, achieved by PT BBTN.

Table 9. K-S Test Results

	Kolmogorov-Smirnov[a]		
	Statistic	**Df**	**Sig.**
LC	.068	113	.200*
SC	.076	113	.138

* This is a lower bound of the true significance.
* Lilliefors Significance Correction

Table 10. The Average Stock Return during the period 2015-2017

Year	Semester	Mean LC	Mean SC	Mean Difference	t	Sig. (2tailed)	Legend
Period 2015 – 2017		0,008407	-0,005494	0,0139009	2.410	0,018	Significant
2015	1	-0,018079	-0,044821	0,027421	2.096	0.050	Significant
	2	0,013444	-0,015533	0,289778	1.980	0,064	Not Significant
2016	1	0,020216	0,054884	-0,0346684	-2.692	0,015	Significant
	2	-0,000390	-0,016010	0,0156200	1.832	0,083	Not Significant
2017	1	0,016689	-0,005089	0,0217789	2.242	0,038	Significant
	2	0,019894	-0,005544	0,0254389	3.121	0,006	Significant

Data Analysis Requirements Test

The data analysis requirements in this study utilized the Kolmogorov-Smirnov test. The following is a summary of the normality test on the companies that joined the LQ-45 index during the period 2015-2017, including the normality tests conducted per semester:

Table 9 shows that the significance of the K-S test for large companies (LC) and small companies (SC) yielded a significance value > 0.05, indicating that the data is normally distributed. With normally distributed data, the paired sample t-test technique can be employed to examine the difference in average stock returns between large companies (LC) and small companies (SC).

Qualitative Analysis

A Paired Sample t-test using SPSS was conducted to examine the difference in average stock returns between large and small companies in the LQ-45 index during the period 2015-2017. The results of the paired sample t-test are presented in Table 10.

Table 10 shows the significance value of t for the period 2015-2017, which is 0.018 < 0.05, indicating a significant difference between the returns of large companies (LC) and small companies (SC).

In the first semester of 2015, the significance value of t is 0.050 = 0.05, meaning that there is a significant difference between the returns of large companies (LC) and small companies (SC). However, in the second semester of 2015, the significance value of t is 0.064 > 0.05, indicating no significant difference between the returns of large companies (LC) and small companies (SC).

In the first semester of 2016, the significance value of t is 0.015 < 0.05, indicating a significant difference between the returns of large companies (LC) and small companies (SC). On the other hand, in the second semester of 2016, the significance value of t is 0.083 > 0.05, suggesting no significant difference between the returns of large companies (LC) and small companies (SC).

For the first semester of 2017, the significance value of t is 0.038 < 0.05, indicating a significant difference between the returns of large companies (LC) and small companies (SC). Similarly, in the second semester of 2017, the significance value of t is 0.006 < 0.05, indicating a significant difference between the returns of large companies (LC) and small companies (SC).

4. Discussion

The results of this study indicate that there is no size effect anomaly in the Indonesian Stock Exchange for LQ-45 companies during the period 2015-2017.

The use of market capitalization as a proxy for company size shows contradictory results to Banz (1981), Fama and French (1993, 1995, 1996), and Xu (2002), who found size effect anomalies. However, this research supports the findings of Kurniawan and Purbawangsa (2018), Mikhael and Widanaputra (2018), and Ramel Yanuarta (2012). The hypothesis of an inefficient market in weak form cannot be proven due to the absence of a size effect anomaly. This difference is likely due to the distinct characteristics of the Indonesian capital market.

The results of the study for the first semester of 2015 show the same conclusion as the testing period of 2015-2017, namely that the average return of LC>SC. Interestingly, during this semester, the return of LQ-45 stocks decreased by 1.95 points (0.23%). Analyst PT.Pefindo Riset dan Konsultasi (Guntur Tri H) stated that the decline in stock prices on the IDX is not only due to fundamental factors but also because of the transfer of assets from developing countries to developed countries, especially to the United States. On the other hand, the second semester of 2015 provides the same conclusion as the period of 2015-2017 and the first semester of 2015. LC>SC return is due to the increase in the national banking non-performing loan (NPL) ratio by 2.67% or a 33 basis point increase year on year (Bisnis.com).

The results of the study for the first semester of 2016 yield a different conclusion, namely the significant presence of a size effect anomaly indicated by LC<SC return. This is attributed to the significant price surges of three mining commodity companies (ANTM, PTBA, and ADRO) within LQ-45, with each experiencing price increases of 129%, 71%, and 69%, respectively. The second semester of 2016 shows different results compared to the first semester, as no size effect anomaly is found. The average return of LC>SC is due to the inability of ANTM, PTBA, and ADRO stock prices to sustain their previous levels, as well as three SC companies that weighed down the index, namely LPKR with a 30% decline, BMTR with a 45% decline, and JSMR which continued to decline (Bareksa.com).

The results of the study for the year 2017 first semester indicate the absence of a significant size effect anomaly, with an average return of LC>SC. The same applies to the second semester of 2017, which also shows no significant size effect anomaly with an average return of LC>SC.

Throughout 2017, the capital market was influenced by conducive global and domestic economic conditions. Globally, the trend of global economic recovery continued, with maintained volatility, especially in global financial markets. This was supported by effective communication between The Fed and global market participants regarding the direction of US monetary policy. Additionally, the continued monetary stimulus by the European Central Bank (ECB) and the Bank of Japan (BoJ) ensured the preservation of global liquidity supply. This liquidity became the driving force behind the vibrant capital markets in various regions, including Indonesia. Internally, Indonesia's positive economic growth and improving prospects as a result of ongoing economic reforms by the government also contributed to increasing investor confidence in the capital market. Furthermore, it was supported by better macroeconomic management.

5. Conclusion

- ☑ During the period of 2015-2017, no size effect anomaly was found in the Indonesian Stock Exchange among companies included in the LQ-45 index.
- ☑ In each semester of the 2015-2017 period, the size effect anomaly was only observed in the first semester of 2016.

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