

ANALYSIS OF THE EFFECT OF INVESTMENT OPPORTUNITY SET AND PROFITABILITY ON FIRM VALUES WITH DIVIDEND POLICY AS INTERVENING VARIABLES IN MAIN SECTOR COMPANIES LISTED IN INDONESIA STOCK EXCHANGE IN 2015-2017

Windo sinurat¹, Erlina², Rina Bukit³

^{1,2,3}Universitas Sumatera Utara
sinuratwindo@gmail.com

Abstract: This study aims to analyse the set of investment and profitability opportunities that affect the value of the company with dividend policy as an intervening variable in the main sector companies listed in the Indonesian Stock Exchange in the 2015-2017 period. The population in this study amounted to 98 companies using the purposive sampling method obtained as many as 44 data. Data testing methods used are analysis of multiple linear regression and path analysis. The results of the first hypothesis study indicate that partially, the investment opportunity and profitability variable does not affect the dividend policy. In partial, the investment opportunity set variable does not have a significant effect on firm value, while the profitability variable has a significant positive effect on firm value. The investment policy variable is unable to act as an intervening variable between sets of investment opportunities on firm value. Dividend policy is also not able to play an intervening variable between profitability variables on firm value in the main sector companies listed on the Indonesia Stock Exchange in the period of 2015-2017.

Keyword: Investment Opportunity Set, Profitability, Firm Value, Dividend Policy

1. Introduction

The company's main goal in the long run is to increase the firm value in each period. The ups and downs of the firm value can be seen from the price of its shares. Companies that have a high level of firm value are considered to be able to prosper shareholders, and this can attract the attention of investors to invest their capital in the company.

Firm value can basically be measured through various aspects, one of which is through Price to Book Value (PBV). Firm value that has gone public is reflected in the company's stock price, because the company's stock price reflects the overall investor valuation of each owned equity. High firm value can increase prosperity for shareholders, so that shareholders will invest their capital in the company's market.

A company with good financial performance has attracted many investors. Good financial performance can be seen from the financial statements published by the company. The higher the stock price, the value of the company and the prosperity of the shareholders also increases.

Some factors that affect the firm value in accordance with the theory and research that has been done are institutional ownership, managerial ownership, family ownership, independent commissioners, audit committees, audit quality,

profitability, leverage, firm size, free cash flow, investment opportunity sets, earnings management (Pantow, Murni, & Trang, 2015; Adi Putra & Lestari, 2016; Ernawati & Widyawati, 2015; Thaharah & Asyik, 2016).

This study only uses two variables namely the Investment Opportunity and Profitability Set on the grounds because (Sudana, 2009) states there are three main financial functions and are related to financial management decisions, one of which is an investment decision. Financial management involves the settlement of important decisions that will be taken by the company. The Investment Opportunity Set shows the firm growth potential, so that it becomes an attraction for investors because it will benefit investors in the future. Meanwhile, profitability is used in this study because basically profitability ratios are used to show how well companies can earn profits or profits from their operations. Investors or creditors can use this profitability ratio to assess the return on investment based on the level of use of assets and other resources. In other words, this profitability ratio is used to assess whether the company generates sufficient profit from the company's assets.

The first factor that is thought to play a role in determining firm value is the investment opportunity set. Investment Opportunity Set measured by many proxies, namely MVBVA, MVBVE, Tobin's Q2, EPS, ROE, CAPBVA, CAPMVA, InvToNet, Variance. The investment opportunity set or often referred to as the IOS (Investment Opportunity Set) provides broader guidance where the firm value as the main goal depends on the company's future expenses. If the condition of the company is very good then the management will tend to prefer new investments rather than pay high dividends. The funds that should be paid as cash dividends to shareholders will be used to purchase profitable investments, even to overcome underinvestment. Investment opportunities created by management will affect the perspective of investors and company owners, thereby affecting the firm value. The effect between the Investment Opportunity Set and firm value is signalling, where investors will give a positive signal to companies that have a high set of investment opportunities, because they are more promising future returns. This is in line with research that says that investment opportunity sets affect dividend policy (Putri, 2013), but it is not in line with research which states that investment opportunity sets do not affect dividend policies (Ridho, 2014). This is also in line with research which states that the investment opportunity set has a significant positive effect on firm value (Hasnawati, 2005) and (Artiningsih, Khuzaini, & Lina, 2017). However, it is different from research which states that the investment opportunity set does not have a significant effect on firm value (Hariyanto & Lestari, 2015).

The second factor that is thought to be influential in determining firm value is profitability. Profitability as measured by Return On Assets. High profitability reflects the company's ability to generate high profits for shareholders. The greater the profits obtained, the greater the company's ability to pay dividends, and this has an impact on increasing the firm value. This is not in line with research which states that profitability has a negative effect on dividend policy (Dewi, 2008), but in line with research which states that profitability has a positive effect on dividend policy (Arilaha, 2009). This is also in line with research which states that profitability affects firm value (Adi Putra & Lestari, 2016; Artiningsih, Khuzaini, & Lina, 2017).

But it is inversely proportional to the research which states that profitability has no effect on firm value (Thaharah & Asyik, 2016).

The study uses four variables, namely investment opportunities, profitability, dividends and firm value.

2. Literature Review

2.1 Agency Theory

Agency theory explains the relationship between company financial performance and environmental information disclosure. Companies that have good financial performance will certainly increase company profits which will affect the extent of financial information disclosure so as to reduce agency costs. The amount of profits owned by the company will make management motivated in expanding the disclosure of company information because the cost of disclosure that can be met. Disclosure of extensive information on a company will make the principal fulfilled in the information needed.

2.2 Signalling Theory

Signal theory explains how companies should give signals to users of financial statements. Signalling theory emphasizes the importance of information released by companies on investment decisions for parties outside the company. According to Ross (1977) that information is an important element for investors and business people because it presents information, notes or pictures both for past, present and future conditions for the survival of a company and how it markets its effects. Gordon (1959) states that the relationship between stock prices and dividend announcements depends on the amount of information that depends on the announcement and some of the information contained in the announcement and the amount of information affects investor expectations.

2.3 Firm Value

Theories in finance have one focus, which is to maximize the prosperity of shareholders or company owners (wealth of the shareholders). This normative objective can be realized by maximizing firm value (market value of firm). For companies that have gone public, maximizing the market value of the company is the same as maximizing the stock market price (Sudana, 2011). The task of managers in terms of maximizing firm value is to maximize the value of company shares. Whether or not this goal is achieved can be seen and measured from the stock price of the company concerned from time to time. The advantage of increasing the value of a company's shares is that the company will gain the trust of financial institutions (banks) to obtain loans with softer terms and the trust of suppliers (Kasmir, 2010). The price of a company's shares, especially its market value, can change over time.

The creation of firm value can be done through decision making in the company, namely strategic decisions and operational decisions made continuously. Management must always strive to create decisions using existing opportunities and effective and efficient allocation of resources. In addition, management is not only required to look at the opportunities that exist, but also to be able to create various opportunities that will have a positive impact on the value creation process of the company or shareholders.

Financial ratios are used by investors to find out the company's market value. This ratio can give management an indication of investors' assessment of the company's past performance and future prospects. There are several ratios to measure the company's market value, one of which is PBV. This ratio is considered to provide the best information, because this ratio can explain various phenomena in company activities, such as the occurrence of cross-sectional differences in investment decision making and diversification (Claessens and Fan, 2003 in Sukamulja, 2004), the relationship between management ownership and company value (Onwioduokit, 2002 in Sukamulja, 2004), the relationship between management performance and profits in acquisitions (Gompers, 2003 in Sukamulja, 2004) and funding, dividend and compensation policies (Imala, 2002 in Sukamulja, 2004).

The description that has been explained, firm value going public is reflected through the value of its shares in the market. The value of a company's shares in the market is affected by various factors that cause a company's stock prices to be high or low. With good firm value, it will facilitate the company in building stakeholder confidence in the company (Groth, 2016).

2.4 Investment Opportunity Set (IOS)

Investment opportunity set is a choice of future investment opportunities that can affect the firm growth or project assets that have a positive Net Present Value (NPV). The investment opportunity set has a very important role for the company because IOS is an investment decision in the form of a combination of assets owned (assets in place) and investment options in the future that are expected to provide investment returns is a policy in the form of capital allocation whose realization must produce benefits or future benefits (Jones, 2001).

Investment options in the future were not merely shown in projects supported by research and development activities. But also with the company's ability to take advantage of profitable investment opportunities compared to other companies that are equal in the industry group. In general, the investment opportunity set illustrates how much opportunity there is in a company to make investments that are expected in the future to provide high returns for the company.

The higher investment opportunity is caused by increasing a company's income so that when a company's income increases, investors will feel that the company will grow rapidly, this can increase the firm value. The above theory is in line with research conducted by (Hasnawati, 2005) by finding that investment opportunity sets affect firm value.

2.5 Profitability

Profitability is the ability to generate profits (profit) during a certain period by using productive assets or capital, both capital as a whole and own capital. Investors in the capital market are very concerned about the company's ability to generate, support, and increase profits, if the company's profits are high, investors will be interested in buying these shares, so the price of the shares will increase. Return on Assets (ROA) is a ratio that measures a company's ability to generate net income based on certain asset levels. From an investor's perspective, one of the important indicators to assess the company's prospects in the future is to see the extent of the company's profitability growth. This ratio is important to note to

determine the extent to which an investment made by an investor in a company is able to provide returns that are in accordance with the level required by investors.

2.6 Dividend Policy

Dividend policy is a decision whether the profits earned by the company will be distributed to shareholders as dividends or will be retained. If the company chooses to distribute profits as dividends, it will reduce retained earnings and subsequently reduce total internal or internal financing sources (Sartono , 2001 in Setiawati, 2012). Retained earnings are one of the most important sources of funds to finance company growth, while dividends are cash outflows paid to shareholders. Dividends represent the firm value's net income after tax minus the retained earnings distributed to shareholders as a profit from the company's profit (Setiawati, 2012).

Company policy in determining whether to distribute dividends or not to shareholders or investors will determine the high or low firm value in the eyes of the investors. If the company distributes dividends routinely to investors, investors will argue that their actions in investing in the company are the right decision.

2.7 Hypothesis

Based on theoretical explanations, the hypotheses of this study are as follows:

1. The Investment Opportunity Set has a positive effect on firm value
2. The Investment Opportunity Set has a positive effect on dividend policy
3. Profitability has a positive effect on firm value
4. Profitability has a positive effect on dividend policy
5. The Investment Opportunity Set has a negative effect on the firm value through dividend policy
6. Profitability has a positive effect on firm value through dividend policy

3. Method

This type of research is causal associative research with a quantitative descriptive approach. Descriptive research is carried out to explain, test relationships between phenomena and determine the causality of variables. Causality is a type of research with the aim of testing the cause and effect between 2 (two) or more variables (Sunyoto, 2013).

No	Information	Total
	Study population: Major Sector Companies listed on the Indonesia Stock Exchange in the period of 2015-2017	98
Criteria:		
1.	Major sector companies which do not publish successive annual financial statements on the Indonesia Stock Exchange and the Company's Website during the 2014-2017 period	-32
2.	The main sector companies that suffered losses during the 2014-2017 period	-26
3.	The main sector companies that do not present financial statements in rupiah	-24
	Companies that become research samples	16
	Number of observations = 16 x 3	48

This study uses a data analysis method using SmartPLS software that is run on computer media. PLS (Partial Least Square) is a variance-based structural equation analysis (SEM) that can simultaneously test measurement models as well as structural model testing. The measurement model is used to test the validity and reliability, while the structural model is used to test causality (hypothesis testing with predictive models).

4. Result and Discussion

4.1 Result

The results of the descriptive statistical research consisting of minimum, maximum, and average values of each study variable are presented in the table below:

	N	Minimum	Maximum	Mean
Firm Value	48	0,23	6,12	1,439
Dividend Policy	48	0	78,54	22,4052
Investment Opportunity Set	48	0,12	32,95	3,3205
Profitability	48	1.09	8,73	4,0455

Based on the table, it is known that there are 48 observational data during the 2015-2017 period which can be explained as follows:

1. Firm Value proxied by price to book value (PBV) has a minimum value of 0.23 and a maximum value of 6.12. On average, the main sector companies listed on the Indonesia Stock Exchange in the period 2015-2017 have shares that are valued highly by the market.
2. Dividend Policy which is proxied by a dividend payout ratio has a minimum value of 0, and a maximum value of 78.54.
3. The Dividend Policy must be analysed in relation to spending decisions or the determination of the overall capital structure.
4. The Investment Opportunity Set has a minimum value of 0.12 and a maximum value of 32.95, the investment opportunity data set is very heterogeneous with a very wide spread.
5. Profitability which is proxied by return on assets has a minimum value of 1.09, and a maximum value of 8.73.

Based on the test results obtained by R Square results as shown in the following table:

Variable	R Square
Dividend Policy	0,075
Firm Value	0,422

Based on the results in the table above shows the value of R Square obtained by 0.075 which means the influence of the independent variable is the investment opportunity set, and profitability on the dividend policy variable is 0.075 or 7.5% while the remaining 92.5 is explained by other variables not examined in this research.

Based on the results in the table above shows the value of R Square obtained by 0.422, which means the effect of independent variables, namely the investment

opportunity set, profitability, and investment policies on the variable firm value of 0.422 or 42.20% while the remaining 57.80 is explained by other variables that are not examined in this study.

Partial Significance Test

The results of the regression analysis test through the t-test are shown in the following table:

	Original Sampel	T Statistics	P Values
Investment Opportunity Set -> Dividend Policy	-0,124	0,277	0,782
Investment Opportunity Set -> Firm Value	0,403	1,050	0,294
Profitability -> Dividend Policy	0,343	1,539	0,124
Profitability -> Firm Value	0,311	2,124	0,034
Policy -> Firm Value	-0,215	1,136	0,256

1. Effect of Investment Opportunity Set on Dividend Policy

Based on the partial test calculations obtained from table above, the value of p value is greater than 0.05 ($0.782 > 0.05$) which means that the investment opportunity set has no effect on dividend policy.

2. Effect of Profitability on Dividend Policy

Based on the partial test calculations obtained from table above, the value of p value is greater than 0.05 ($0.124 > 0.05$) which means that profitability has no effect on dividend policy.

3. Effect of Investment Opportunity Set on Firm Value

Based on the partial test calculations obtained from table above, the value of p value is greater than 0.05 ($0.294 > 0.05$) which means that the investment opportunity set does not affect the firm value.

4. Effect of Profitability on Firm Value

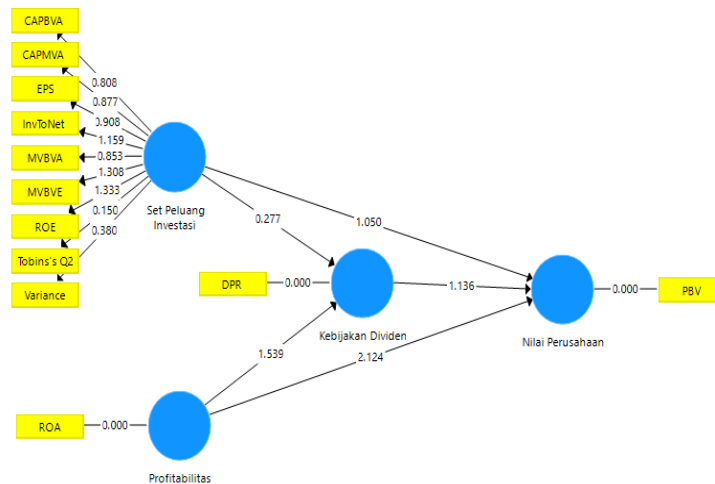
Based on the partial test calculations obtained from table above, the value of p value is less than 0.05 ($0.034 < 0.05$) which means that profitability has a positive effect on firm value.

5. Effect of Dividend Policy on Firm Value

Based on the partial test calculations obtained from table above, the value of p value is greater than 0.05 ($0.256 > 0.05$), which means that dividend policy has no effect on firm value.

Test Path Analysis

The hypothesis testing is done by path analysis which is an extension of multiple linear regression. From the results and explanations above, the conceptual framework for path analysis is formed as follows:



Conceptual Framework for Path Analysis

Based on Figure above, the value of the indirect effect between the independent variables on the intervening variable (P2) is as follows:

- Investment Opportunity Set on Dividend Policy = 0.277
- Profitability for Dividend Policy = 1,539

Table 1. Path Analysis Test Results

Independent Variable	Direct Effect (P1)	Non-direct Effect (P2 X P3)	Total Effect	Information
Investment Opportunity Set	1,050	$0,277 \times 1,136 = 0,317$	1,367	Not able to mediate
Profitability	2,124	$1,539 \times 1,136 = 1,748$	3,872	Not able to mediate

4.2. Discussion

The Effect of Investment Opportunity Set on Dividend Policy

This study shows that the investment opportunity set variable does not significantly affect dividend policy. This is in line with research conducted by (ailatut, 2018) which states that the investment opportunity set does not significantly affect dividend policy. This insignificance occurs because the main sector companies use various dividend policies, namely zero-growth dividend, constant growth dividend, and low-regular and extra dividend so that the size of the funds spent to invest does not affect the size of the dividend to be distributed. Therefore, the investment opportunity set variable will receive less attention and become insignificant towards dividend policy.

The Effect of Profitability on Dividend Policy

This study shows that profitability has no effect on dividend policy. This is in line with research conducted by (Hendika, 2015) which states that profitability has no effect on dividend policy. This proves that the size of corporate profitability is not necessarily a dividend policy will also increase. Increasing the value of profitability just shows hope for investors.

The Effect of Investment Opportunity Set on Firm Value

This study shows that the investment opportunity set does not affect the firm value. This is in line with research conducted by (Maria, 2016) which states that the investment opportunity set does not affect the firm value.

The investment opportunity set is the firm value which depends on the expenses determined by management in the future, where at present the investment choices are expected to give the company greater returns (Gaver & Gaver, 1993). The investment opportunity set does not affect the firm value because investors who want to invest their shares do not see how much the return on what is invested but investors see the firm growth continues to increase. Big or small the level of expenditure for investment by the company will not affect the interest of investors in the interest to invest their capital to the company.

The Effect of Profitability on Firm Value

This study shows that profitability has a positive effect on firm value. This is in line with research conducted by (Ria, 2013) which states that profitability affects firm value.

The better profitability growth means the future prospects of the company are getting better too, which means the better the firm value in the eyes of investors. If the company's ability to generate profits increases, the share price will also increase (Husnan, 2011). Rising stock prices reflect good firm value for investors.

The rate of return on investment to shareholders depends on the profits generated by the company. (Oktaviani, 2008) also states that with the high level of profit generated, it means that the prospect of the company to carry out its operations in the future is also high thereby firm value which is reflected in the company's share price will also increase.

The Effect of Investment Opportunity Set on Firm Value through Dividend Policy

This study shows that dividend policy is not able to mediate the effect of investment opportunity sets on firm value. This is in line with research conducted by (Taufir, 2017) which also states that dividend policy is incapable as an intervening variable between the set of investment opportunities and firm value.

One of the factors that affect stock prices is the ability of companies to pay dividends. If the dividend paid is high, then the share price tends to be high so firm value is also high, conversely, if the dividend paid is small, then the company's share price is also low. The statement is not comparable with the results of research conducted in this study. The higher level of investment made by the company will directly increase firm value. Because investors know that the company has the remaining cash that can be used as funds to invest. Investors will see that the company's long-term will be better. This states that investors are no longer concerned with the level of dividend payments by companies, but look at the company's ability to run the company's prospects in the future.

The Effect of Profitability on Firm Value through Dividend Policy

This study shows that dividend policy is not able to mediate the effect of profitability on firm value. This is in line with research conducted by (Murni, 2016) which states that dividend policy is unable to act as an intervening variable in the effect of profitability on firm value.

The company distributes dividends if the company has excess funds obtained by the company. The maximum amount of funds distributed as dividends is measured using net income after tax. The higher or lower company dividend policy results from the size of the profitability of the company produced.

The size of the profit will make the distribution of dividends will remain. This is because the company will not distribute dividends because the company will do a lot of operational activities. Investors will also realize that. Not being distributed dividends will not give a negative response from investors to the company.

5. Conclusion and Suggestion

5.1 Conclusion

From the discussion above, it can be concluded that the Investment Opportunity Set does not affect the Dividend Policy, the Investment Opportunity Set does not affect the Firm Value, Profitability does not affect the Dividend Policy, Profitability has a positive effect on Firm Value, the Dividend Policy is unable to act as a mediation between the effects of Set of Investment Opportunities on Firm Value, Dividend Policy is unable to act as a mediator between the effect of Profitability on Firm Value.

5.2 Suggestion

Based on the conclusions in this study, the suggestions that can be given in future studies are expected to add research variables such as auditor quality. This is due to the fact that the external auditor has the ability to disclose any fraud that has occurred to the company and has the competence to present and disclose financial statements fairly. In the next research it is hoped that it can expand the object of research so that research will be better in the future. In future studies, it is expected to be able to use / replace intervening variables into CSR. This is because the higher level of CSR disclosure of a company will attract the attention of investors due to an increase in demand for shares which will result in the firm value will also increase.

References

- Adi Putra, A. D., & Lestari, P. V. (2016). Effect of Dividend Policy, Liquidity, Profitability, and Firm Size on Firm Value. *E-Journal of Management*, Udayana University, 4044-4070.
- Arilaha, M. A. (2009). The Effect of Free Cash Flow, Profitability, Liquidity, and Leverage on Dividend Policy. *Journal of Finance and Banking*, 78-87.
- Artiningsih, D. W., Khuzaini, & L. P. (2017). The Effect of Profitability, Investment Opportunity Set (IOS), Leverage and Dividend Policy on Firm Value in the L Service in the Indonesia Stock Exchange. *Journal of Applied Management and Business*, 235-245.
- Azhar, Z. A., Ngatno, & Wijayanto, A. (2016). The Effect of Profitability on Firm Value Through Dividend Policy as an Intervening Variable.
- Basir, S., & Fakhrudin, H. M. (2005). *Corporate Action*. Jakarta: Salemba Empat.

- Dewi, S. C. (2008). The Effect of Managerial Ownership, Institutional Ownership, Debt Policy, Profitability and Firm Size on Dividend Policy. *Journal of Business and Accounting*, 47-58.
- Epi, Y. (2017, 2). Effect of Firm Size, Managerial Ownership Structure and Profit Management on the Performance of Property and Real Estate Companies listed on the Indonesian stock exchange. *Accounting Research & Journal*, 1 (1).
- Ernawati, D., & Widyawati, D. (2015). Effect of Profitability, Leverage and Firm Size on Company Value. *Journal of Accounting Science & Research*, 4 (1).
- Franedy, R. (2018, 2 20). *Net Profit Declines 20.51%, Elnusa's Share Price Rises 10.22%*. Retrieved 9 7, 2018, from CNBC Indonesia: <https://www.cnbcindonesia.com/market/20180220113808-17-4837/laba-b Bersih-turun-2051-price-saham-elnusa-naik-1022>
- Ghozali, I. (2006). *Multivariate Analysis Application with SPSS Program*. Semarang: Diponegoro University Research Agency.
- Groth, J. C. (2016). *Corporate Communications and Firm Value*. Managerial Finance, 1-5.
- Hariyanto, M. S., & Lestari, P. V. (2015). The Effect of Ownership Structure, IOS, and ROE on Firm Value in Food and Beverage Companies. *E-Management Journal of Udayana University*, 1599-1626.
- Hasnawati, S. (2005). Impact of Investment Opportunity Sets on Public Company Values on the Jakarta Stock Exchange. *JAAI*, 117-126.
- Jones, S. (2001). The Association Between the Investment Opportunity Set and Corporate Financing and Dividend Decisions: Some Australian Evidence. *Managerial Finance*, 48-64.
- Cashmere. (2010). *Introduction to Financial Management*. Jakarta: Kencana. Prenada Media Group.
- Kurniawan, R. (2017, 4 7). *Quarter IV 2016 Financial Statement Performance*. Retrieved 9 7, 2018, from Rivankurniawan Indonesia Value Investor: rivankurniawan.com/2017/04/07/kinerja-reporting-finance-quarter-iv-2016/
- Pantow, M. S., Murni, S., & Trang, I. (2015). Analysis of sales growth, company size, return on assets, and capital structure to the value of the company listed in the index lq 45. *EMBA Journal*, 961-971.
- Putri, D. A. (2013). Effect of Investment Opportunity Set, Debt Policy and Company Size on Dividend Policy on Manufacturing Companies listed on the Indonesia Stock Exchange. *Journal of Management and Entrepreneurship Studies*.
- Ridho, M. (2014). The Effect of Ownership Structure, Investment Opportunity Set (IOS) and Financial Ratios on Dividend Policy. *Journal of Economic and Business Dynamics*.
- Setianto, B. (2016). *Invest in Mutual Funds: Know the Types, Valuation Methods, Performance and Selection Strategies*. Jakarta: BSK Capital.
- Sudana, I. M. (2011). *Corporate Financial Management Theory & Practice*. Erlangga Publisher.

- Sugiyono (2015). *Quantitative, Qualitative, and R&D Research Methods*. Bandung: Alfabeta.
- Suharli, M. (2007). Effect of Profitability and Investment Opportunity Set on cash dividend policy with liquidity as a reinforcing variable. *Journal of Accounting and Finance*, 9-17.
- Sun, J., Lan, G., & Ma, Z. (2014). Investment Opportunity Set, board independence, and firm performance. *Managerial Finance*, 454-468.
- Sunyoto, D. (2013). *Research Methods and Instruments: Economics and Business*. Yogyakarta: CAPS.
- Thaharah, N., & Fun, N. F. (2016). The Effect of Corporate Governance Mechanisms and Financial Performance on Company Value in LQ45 Companies. *Journal of Accounting and Research*.
- Vibby, S. (2010). *Selling Your Stocks is More Expensive*. Jakarta: Vibby Publishing.
- Wibisono, D. (2011). *Performance Management (3rd ed.)*. Jakarta: Erlangga.