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EVIIEWS ANALYSIS: MODEL OF INVESTMENT OPPORTUNITY SET
(IOS) AND ITS IMPLICATION TO CORPORATE VALUE ON
MANUFACTURING COMPANIES LISTED IN INDONESIA STOCK
EXCHANGE (IDX)

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Lely Indriaty¹, Gen Norman Thomas²; Nuzulul Hidayati³; Laili Suryati⁴: Eviews Analysis: Model of Investment Opportunity Set (IOS) and Its Implication to Corporate Value on Manufacturing Companies Listed in Indonesia Stock Exchange (IDX) -- Palarch's Journal Of Archaeology Of Egypt/Egyptology 18(1), ISSN 1567-214x

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Abstract

The study aims to empirically prove Determinants of Investment Opportunity Set (IOS) and its implication to Corporate Value (Tobin's Q): "An Empirical study to Manufacturing Companies Listed in Indonesia Stock Exchange" in 2010-2017, using panel data regression models. Based on the empirical results, three variables significantly affect Investment Opportunity Set (IOS) namely Leverage, CR and ROA, the most dominant influence is ROA with the positive direction. The result of testing simultaneously shows four variables influence Investment Opportunity Set (IOS) to the manufacturing companies listed on Indonesia Stock Exchange. Of the 50 companies as research samples, a company with the most sensitive average of change of IOS is PT Lionmesh Prima Tbk (LMSH) and the least sensitive is PT Astra International, Tbk (ASII). Its implication for Tobin's Q indicates that ROA, CSR, IOS ratio have a positive influence, while LV and CR, negative influences but not significant. The result of simultaneous testing shows LV, CR, ROA, CSR, IOS affect Tobin's Q. The ratio of ROA is the most dominant to affect Tobin's Q with a positive direction. Of the 50 companies as research samples, a company with the most sensitive average of change of Tobin's Q is PT Lionmesh Prima (LMSH) and the least sensitive is PT Kedaung Indah, Tbk (KICI).

INTRODUCTION

Any company wants the growth of their company increases every year. For investors the growth of a company is a profitable prospect, because the investments are expected to give an interesting return. The essence of growth for companies is the existence of investment opportunities that can generate profits as stated by Chung and Charoenwong (1991). Gaver and Gaver (1993)

suggest that investment options or growth options of a company are inherently unobservable. The growth option depends on the discretionary expenditure (Myers, 1977). The model of Investment Opportunity Set (IOS) shows a range of investment opportunities that are influenced by debt against assets, ability to meet short-term liabilities, the level of asset use efficiency and company policy to empathize with social and environmental goals. This model has the same direction in implications for corporate value. The phenomenon that occurs from pre-survey results on the development of leverage, liquidity, profitability, corporate social responsibility, investment opportunity set and corporate value based on 2010-2017 data cannot be explained completely because the development is inconsistent and there is anomaly as shown in table 1:

Table 1. *The Development of Leverage, Liquidity, Profitability, CSR, IOS and Corporate Value on Manufacturing Sector of Public Companies Listed in IDX during period 2010-2015*

Year	Leverage	%	Liquidity	%	Profitability	%	CSR	%	IOS	%	Tobin's Q	%
2010	0.59		272.47		12.43		0.37		0.97		0.39	
2011	0.41	-30.5	265.92	-2.4	12.45	0.2	0.35	-5.4	0.9	-7.2	0.38	-2.56%
2012	0.47	14.6	368.41	38.5	13.44	7.9	0.41	17.1	0.93	3.3	0.39	2.63%
2013	0.45	4.3	758.82	105.9	14.05	4.5	0.37	-9.8	0.96	3.2	0.4	2.56%
2014	0.44	2.2	294.65	-61.2	12.8	-8.9	0.41	10.8	0.9	-6.3	0.39	-2.50%
2015	0.42	4.5	459.25	55.9	11.2	-12.5	0.38	-7.3	0.86	-4.4	0.38	-2.56%

Source: www.idx.com, downloaded on September 2, 2016 and processed data

The development of leverage, liquidity, profitability and CSR to be related with the development of IOS during 2010-2015 shows an inconsistent and anomalous direction. The development of ROA in 2010-2011 shows growth of 0.2% while IOS has a negative development of -7.2%. Further, the CSR in 2012-2013 had a negative development of -9.8% while the development of IOS was with a positive direction of 3.2%. Leverage and CSR had a positively growth in 2013-2014 when IOS' growth was negative at -6.3% but in 2014-2015, the leverage and liquidity had an inconsistent influence with the development of IOS. When leverage and CSR have positive direction but IOS has a negative development of -6.3%. The important anomaly occurs on the development of IOS and corporate value in 2010-2011 and 2013-2015. There were several inconsistency and anomaly on the development of leverage, liquidity, profitability, CSR, IOS and corporate value and this research is conducted to find a model of IOS based on the empirical data from the manufacturing sector of public companies listed on the Indonesia Stock Exchange (IDX).

LITERATURE REVIEW

Investment Opportunity Set (IOS)

Various types of growth proxy discussed on Investment Opportunity Set (IOS) have been used by researcher. Kallapur and Trombley (2001) discussed one of the IOS' proxies, where there is a proxy based on price. This proxy presents growth prospect of a company stated by stock price. The basis of stock price based on an opinion that company growth is partially stated, and the growing company has a relatively higher stock price for assets in place than a company without growth. There are various measurements of IOS, not only using single factor but also with several combinations of factor. Company value can be reflected by stock price, while stock price can be reflected by the present value of cash flow of the company that in the future will be received by investor. The research uses a formula of IOS by determining its ratio, where IOS is equal to a market value of equity divided by book value of equity, and while market value of the equity is closing price multiplied by total outstanding stock. Meanwhile, Sugiharti, Purwono, Primanthi and Padilla (2017) stated most industries in Indonesia are labour-intensive, the cost of labour highly influences the value added. In the case of IOS, the economy condition especially the labour condition give a contribution to IOS' development. Sulaeman, Kaliappan, and Ismail (2013) explained the relationship between Foreign Direct Investment (FCI) and Economic Growth in Southern AFRICA Customs Union (SACU) Countries. For achieving IOS' target can be conducted in anywhere.

Corporate Value (Tobin's Q)

Corporate value can be defined as fair value of company. According to Husnan and Pudjiastuti (2004), corporate value is a price to be paid by a buyer if a company is sold. One of the alternatives used in assessing a company's corporate value is by using Tobin's Q ratio. According to Sukamulya (2004). Tobin's Q as an indicator of corporate value has been widely used in financial research, particularly in a research that takes on corporate value issues. Tobin's Q is an indicator to measure a company's performance, particularly related to its value. The ratio of Tobin's Q describes a condition of investment opportunities owned by the company (Lang, Stulz & Walkling, 1989) or the potential growth of the company (Brainard & Tobin, 1968; Tobin, 1969). The ratio of Tobin's Q is obtained when the sum of the market value of all outstanding stock and the market value of all debt are compared to the value of all capital placed in the replacement value of all production capacity. Tobin's Q can be used to measure the company's performance, i.e. from the potential side of a company's market value. Kim, Henderson, and Garrison (1993) explain that theoretically Tobin's Marginal Q is related to the investment rate of a company, but direct measurement of Tobin's Marginal Q is not possible. As Tobin's Average Q is proposed as a proxy for Marginal Q, the use of Average Q in explaining investments has been supported by Tobin himself, and the use of Average Q has been widely used in research studies. Chung and Pruitt (1994) proposed a simple formula for Tobin's Q called Approximation Q that is:

$$\text{Approximation Q} = (\text{MVE} + \text{PS} + \text{Debt}) / \text{TA}$$

Note:

MVE (Market Value Equity)	: the market price of the company's shares multiplied by the number of shares outstanding.
PS (Preferred Stock Debt)	: liquidation value of preferred stock : total book value of short-term debt, long-term debt
Total Assets	: the book value of the total assets of the company that are considered equal to the value of the replacement

Leverage (LV)

Research of Pasternack and Rosenberg (2002), which found that leverage has a positive affect but not significant to investment, also illustrates the inconsistency with the logic of financial theory, the capital structure theory of Modigliani and Miller (1958). The source of investment of financing can be done with debt (leverage), and leverage should have a positive and significant effect on investment. In other research, leverage is also found to have a negative but not significant effect on capital expenditure. Similarly Aivazian, Ge, and Qiu (2005), in his research found that leverage has a negative effect on investment. These findings are certainly contradictory and incompatible with the logic of modern capital structure theory, namely trade-off theory and pecking order theory (Myers, 1984). Leverage can be considered as an estimator of the inherent risk to a company. That is, greater leverage indicates greater investment risk. Companies with low leverage ratios have a lower leverage risk. A high leverage ratio indicates that a firm is not solvable, and its total debt is greater than its total assets. The leverage is a ratio that calculates how much money is provided by creditors, and leverage is also the ratio of total debt to total assets. Investors could have more time to think about investing their fund in a company with a high leverage ratio.

Liquidity (CR)

Liquidity is the company's ability to meet its short-term obligations. Riyanto (2008) states that liquidity is a problem related to the ability of a company to meet its financial obligations that must be paid immediately. According to Fahmi (2012) the liquidity ratio is used to measure the company's ability to meet its short-term obligations. Rahardjo (2006) argues that liquidity ratio aims to estimate the company's financial ability to meet its short-term obligations and financial payment commitments. If the liquidity ratio is higher, then it is better for the investors. Van Horne and Wachowicz (2008) argues that the ratio of liquidity is a ratio that measures the level of the company's ability to meet short-term obligations. In another word, liquidity is the ability of a person or company to fulfill obligations or debts that must be paid immediately with current assets. If a company is able to fulfill its obligations then the company is considered as a liquid company and if the company cannot fulfill its obligations then the company is considered as an illiquid company. To be able to fulfill its obligations the company must have the amount of cash or investment or other current assets that can be

immediately converted into cash to meet its obligations such as paying expenses, bills, and all other due obligations.

Profitability (ROA)

Profitability ratio is a ratio that aims to determine the company's ability to generate profits over a certain period and also provides an overview of the level of management effectiveness in carrying out its operations. A management's effectiveness is seen from the profit generated on the company's sales and investment. Profitability ratio is a ratio that describes the ability of the company in obtaining profit through all capabilities and existing sources such as sales activities, cash, capital, number of employees, and number of branches (Harahap, 2008). This ability is very important for the company and for companies that have been able to achieve a better level of liquidity. The efficiency of use of assets is measured by Return on Assets (ROA). Achieving the highest ROA level is the answer to the implementation of IOS activities. Inefficient use of assets such as the amount of unemployed funds in inventories, the length of funds embedded in accounts receivable, excess cash, fixed assets will result in lower this ratio. A positive Return on Asset (ROA) indicates that the total assets used for the company's operations are capable of generating profits for the company. On the contrary, a negative Return on Assets (ROA) indicates that the total assets that the company, indicating the ability of the total invested capital has not been able to generate profits. Meanwhile, the research result of Saat, and Kallamu (2014) found that ROA influenced Tobin's Q with a negative direction.

Corporate Social Responsibility (CSR)

Corporate Social Responsibility (CSR) is a form of corporate responsibility to the community and the environment. The definition of CSR itself has been elaborated by many experts. The European Commission makes a more practical definition that is basically how companies voluntarily contribute to the formation of a better society and a cleaner environment. Meanwhile, Elkington, (1998) suggests that a company that shows its social responsibility will pay attention to improve the quality of the company (profits); community, especially the community around (people); and the environment. The World Business Council for Sustainable Development (WBCSD) defines corporate social responsibility (CSR) as a business commitment to contribute to sustainable economic development, through collaboration with employees and their representatives, their families, local communities and the general public to improve the quality of life. The CSR concept involves partnership responsibilities between government, community agencies. This partnership is a form of social responsibility among stakeholders. Meanwhile, Belkaoui (2006) explains that accounting discipline responds to the development of corporate social responsibility by giving birth to new discourse on social responsibility accounting (SRA), total impact accounting (TIA), and socio economic accounting (SEA). In this study, 78 items of CSR measurement from Siregar (2008) are used.

MATERIALS AND METHOD

The number of samples to be determined is based on purpose sampling on with several certain criterias, and population 141 companies, where 50 companies as the sample in seven different sectors were obtained. The annual report and financial statement for this quantitative research were from IDX in 2010-2017. The research frame for IOS' Model is shown below:

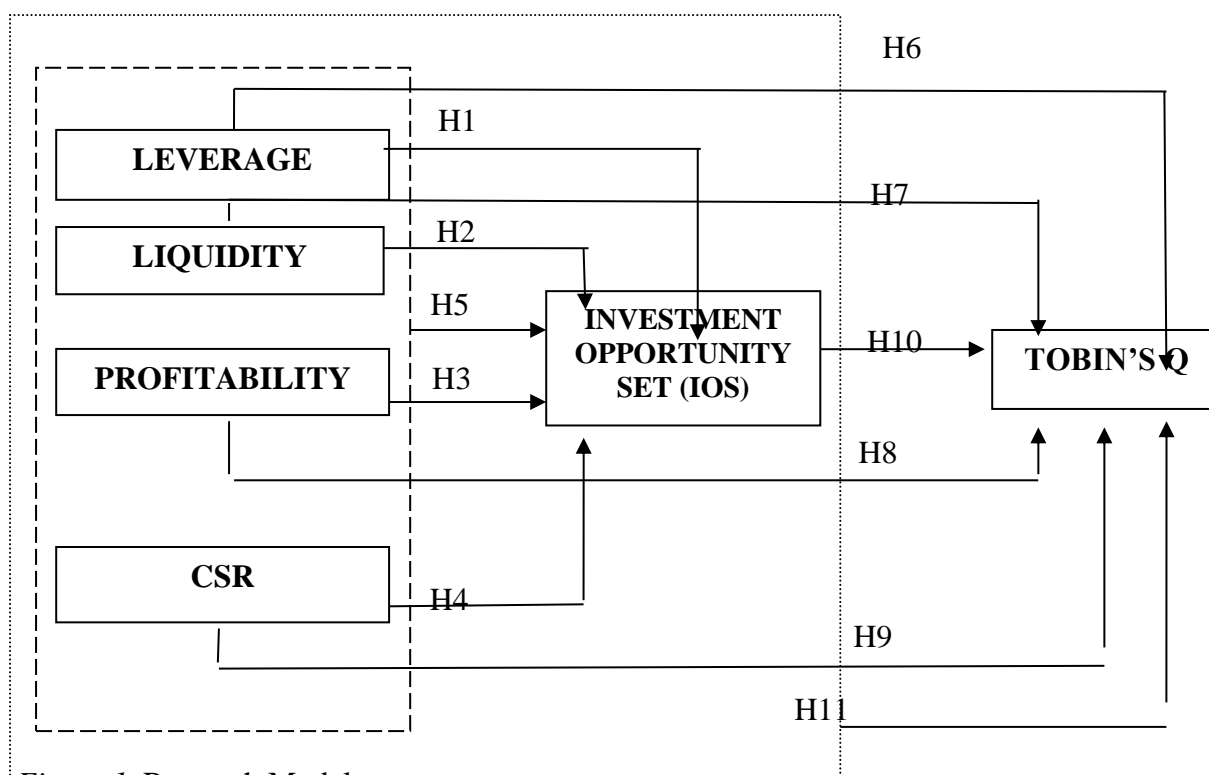


Figure 1. Research Model

Research Hypothesis:

Hypothesis 1: There is a positive influence of LV on Investment Opportunity Set (IOS)

Hypothesis 2: There is a positive influence of CR on Investment Opportunity Set (IOS)

Hypothesis 3: There is a positive influence of ROA on Investment Opportunity Set (IOS)

Hypothesis 4: There is a negative influence of CSR on Investment Opportunity Set (IOS)

Hypothesis 5: There is a simultaneous influence of LV, CR, ROA and CSR to Investment Opportunity Set (IOS)

Hypothesis 6: There is a positive influence of LV on Tobin's Q

Hypothesis 7: There is a positive influence of CR on Tobin's Q

Hypothesis 8: There is a positive influence of ROA on Tobin's Q

Hypothesis 9: There is a positive influence of CSR on Tobin's Q

Hypothesis 10: There is a positive influence of IOS on Tobin's Q

Hypothesis 11: There is simultaneous influence of LV, CR, ROA, CSR, and IOS to Tobin's Q

RESULTS AND DISCUSSIONS

LV, CR, ROA and CSR variables are partially and simultaneously affecting IOS, and while LV, CR, ROA, CSR and IOS variables have partial and simultaneous implication for Tobin's Q. The results are descriptive data onto each research variable and tested for the proposed hypotheses.

Descriptive

Statistical data onto the impact on LV, CR, ROA and CSR implementation on IOS, and implication on Tobin's Q in manufacturing sector public companies in the period of 2010-2017 can be presented as follows:

Table 2. Description of Statistical Data

	IOS?	TOBIN?	LV?	CR?	ROA?	CSR?
Mean	2.31648 4	2.194174	0.388439	2.760205	0.081586	0.569859
Median	1.21000 0	1.100000	0.410000	1.760000	0.080000	0.420000
Maximum	22.2900 0	98.00000	1.470000	16.65000	2.607326	52.00000
Minimum	- 1.529409	-1.084286	-2.551648	-7.280000	-4.034420	-2.358992
Std. Dev.	3.10415 3	5.375796	0.388425	2.873652	0.357945	2.627941
Skewness	3.12178 3	14.75569	-4.066437	2.158207	-5.126189	19.24707
Kurtosis	15.0936 6	259.7925	28.37613	8.643319	78.48506	377.1196
Jarque-Bera	3017.84 6	1088500.	11568.58	822.3785	94542.25	2304412.
Probability	0.00000 0	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	905.745 1	857.9220	151.8797	1079.240	31.90027	222.8147
Sum Sq. Dev.	3757.94 8	11270.68	58.84073	3220.572	49.96849	2693.368
Observations	400	400	400	400	400	400
Cross sections	50	50	50	50	50	50

Source: Processed Data (IDX 2017)

Determinant of Investment Opportunity Set (IOS).

Regression model to estimate the influence of determinant of IOS includes: the following Common Effect (CE), Fixed Effect (FE) and Random Effect (RE). Chow test and Hausman test are used to choose which regression is better. The selected regression model is used to over variables.

Table 3. Chow Test on Investment Opportunity Set (IOS)

Redundant Fixed Effects Tests

Pool: LELI3

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	41.422374	(48,339)	0.0000

Source: Processed Data (IDX 2017)

Based on Chow Test it can be concluded that Fixed Effect Model is better than Common Effect because cross-section F is 41.422374 with the probability $0.0000 < 0.05$, then H_0 is accepted, but the result is not yet final as it required Hausman Test, as shown in the following table:

Table 4. Hausman Test on Investment Opportunity Set (IOS)

Correlated Random Effects - Hausman Test

Pool: LELI3

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	39.323387	4	0.0000

Source: Processed Data (IDX 2017)

Hausman Test shows that Fixed Effect is better that Random Effect because cross-section random is 39.323387 with the probability $0.0000 < 0.05$, then the H_0 is accepted, and then result of the model selection is presented below.

Table 5. Conclusion the Best Model Selection for IOS as a Bound Model

Test	Count	Probability	Conclusion
Chow Test (CEM vs FEM)	F hit = 41.422374	0.0000	FEM better
Hausman Test (FEM vs REM)	Chi-Sq. Statistic = 39.323387	0.0000	FEM better

Source: Processed Data (IDX 2017)

Determinant Investment Opportunity Set and Implication on Tobin's Q

Table 6 presents a combination of two models of panel data regression in model 1 : Determinant of IOS and model 2 : Implication for Tobin's Q are presented as follows:

Table 6. Determinant of IOS dan Implication for Tobin's Q

IOS			Tobin's Q		
Regression Coefficient	Prob	Sig/Non Sig (NS)	Regression Coefficient	Prob	Sig /Non Sig(NS)

C	2.108272	0.0000 *	Sig	0.792308	0.0000*	Sig
LV	0.378751	0.0281 *	Sig	-0.120446	0.6835	NS
CR	-0.034393	0.0344 *	sig	-0.002530	0.5520	NS
ROA	2.462013	0.0000 *	Sig	0.581041	0.0000*	Sig
CSR	-0.001690	0.5992	NS	0.004773	0.0000*	Sig
IOS				0.497242	0.0000*	Sig

Note: * significant with $\alpha = 0.05$

Regression Equation:

$$IOS = 2.108272 + 0.378751LV - 0.034393CR + 2.462013ROA - 0.001690CSR$$

$$Tobin's Q = 0.792308 - 0.120446LV - 0.002530CR + 0.581041ROA + 0.004773CSR + 0.497242IOS$$

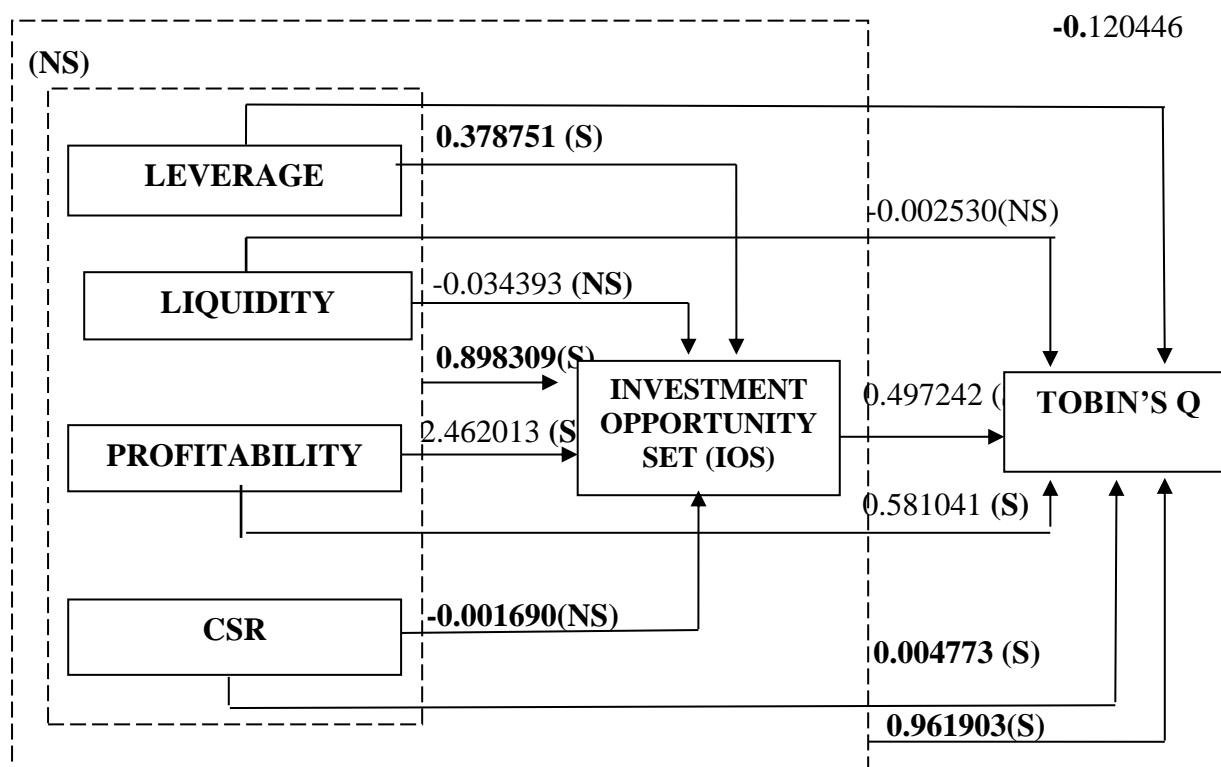


Figure 2. Research Result

Based on the estimation and analysis of empirical result by using fixed regression model, it can be concluded that variable of LV, CR, ROA and CSR simultaneously affect IOS as equal to 0.898309 or 89.83 % and the 10.17 % remainder are not explained in this IOS determinant model this. Two variables have a positive and significant effect on IOS, namely LV and ROA. One variable has a negative and significant effect on IOS and another variable has a negative but not significant effect on IOS.

- The Effect of Leverage to Investment Opportunity Set (IOS)

The empirical findings show that the probability value of 0.0281 is smaller than $\alpha = 0.05$ so it is said to be significant. Regression coefficient of 0.378751 and t statistic of 2.204942 stated that LV has a positive and significant effect on IOS.

- The Effect of Liquidity to Investment Opportunity Set (IOS)

The empirical findings show that the probability value of 0.0344 is smaller than $\alpha = 0.05$ so it is said to be significant. Regression coefficient of -0.034393 and t statistic of -1.793517 stated that CR has a negative and significant effect on IOS.

- The Effect of Profitability to Investment Opportunity Set (IOS)

The empirical findings show that the probability value of 0.0000 is smaller than $\alpha = 0.05$ so it is said to be significant. Regression coefficient of 2.462013 and t statistic of 7.110164 stated that ROA has a positive and significant effect on IOS.

- The Effect of Corporate Social Responsibility to Investment Opportunity Set (IOS)

The empirical findings show that the probability value of 0.5992 is bigger than $\alpha = 0.05$ so it is said to be significant. Regression coefficient of -0.001690 and t statistic of stated that CSR has a negative and not significant effect on IOS.

Based on the estimation and analysis of empirical result by using fixed regression model, it can be concluded that variable of LV, CR, ROA, CSR and IOS simultaneously affect Tobin's Q as equal to 0.961903 or 96.19 % and the 3.81% remainder not explained in Tobin's Q implication model this. Three variables have a positive and significant effect on Tobin's Q, namely ROA, CSR and IOS. Two variables have a negative but not significant effect on Tobin's Q, namely LV and CR.

- The Effect of Leverage to Corporate Value (Tobin's Q)

The empirical findings show that the probability value of 0.6835 is bigger than $\alpha = 0.05$ so it is said to be not significant. Regression coefficient of -0.120446 and t statistic of -1.417932 stated that LV has a negative but not significant effect on Tobin's Q.

- The Effect of Liquidity to Corporate Value (Tobin's Q)

The empirical findings show that the probability value of 0.5520 is bigger than $\alpha = 0.05$ so it is said to be not significant. Regression coefficient of -0.002530 and t statistic of 0.595421 stated that CR has a negative but not significant effect on Tobin's Q.

- The Effect of Profitability to Corporate Value (Tobin's Q)

The empirical findings show that the probability value of 0.0000 is smaller than $\alpha = 0.05$ so it is said to be significant. Regression coefficient of 0.581041 and t statistic of 4.551357 stated that ROA has a positive and significant effect on Tobin's Q.

- The Effect of Corporate Social Responsibility (CSR) to Corporate Value (Tobin's Q)

The empirical findings show that the probability value of 0.0000 is smaller than $\alpha = 0.05$ so it is said to be significant. Regression coefficient of 0.004773 and t statistic of 4.997761 stated that CSR has a positive and significant effect on Tobin's Q.

- The Effect of Investment Opportunity Set (IOS) to Corporate Value (Tobin's Q)

The empirical findings show that the probability value of 0.0000 is smaller than $\alpha = 0.05$ so it is said to be significant. Regression coefficient of 0.497242 and t statistic of 29.29060 stated that IOS has a positive and significant effect on Tobin's Q.

CONCLUSIONS

This study analyzes the determinants that affect Investment Opportunity Set (IOS) and their implication to Tobin's Q on the manufacturing sector in 2010-2017. The conclusions are the following:

1. Hypothesis 1 is accepted, LV affects IOS positively and significantly on manufacturing companies in 2010-2017.
2. Hypothesis 2 is accepted, CR affects IOS negatively and significantly on manufacturing companies in 2010-2017.
3. Hypothesis 3 is accepted, ROA affects IOS positively and significantly on manufacturing companies in 2010-2017.
4. Hypothesis 4 is rejected, CSR affects IOS negatively but not significantly on manufacturing companies in 2010-2017.
5. Hypothesis 5 is accepted, LV, CR, ROA and CSR simultaneously affect the IOS of the manufacturing companies in 2010-2017.
6. Hypothesis 6 is rejected, LV affects Tobin's Q negatively but not significantly on manufacturing companies in 2010-2017.
7. Hypothesis 7 is rejected CR affects Tobin's Q negatively but not significantly on manufacturing companies in 2010-2017.
8. Hypothesis 8 is accepted, ROA affects Tobin's Q positively and significantly on manufacturing companies in 2010-2017.
9. Hypothesis 9 is accepted, CSR affects Tobin's Q positively and significantly on manufacturing companies in 2010-2017.
10. Hypothesis 10 is accepted, IOS affects Tobin's Q positively and significantly on manufacturing companies in 2010-2017.
11. Hypothesis 11 is accepted, LV, CR, ROA, CSR and IOS simultaneously affect the Tobin's Q of the manufacturing companies in 2010-2017.

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