

## Creation of Investment Opportunities through Increased Sales

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### Abstract

*This research aimed to develop a theoretical approach as a mean to improve investment opportunity set. The effort done were involving capital structure, research and development, and firm size, also proposing a growth sales as an intervening variable so that to build a grand theoretical model. The population of this research was manufacture companies registered in Indonesia Stock Exchange during observation period from 2007 to 2016. Path analysis was used as a mean of analysis helped by AMOS program. The main finding was growth sales which is the mediation between the effect of debt to equity ratio to Market to Book ratio. Debt equity ratio has shown to have indirect influence on Market to Book ratio positive value through sales growth. While sales growth did not mediate the effect of size to Market to Book ratio. The result showed R&D intensity and sales growth gave positive and no significant effect on Market to Book ratio, firm size gave positive and significant effect on Market to Book ratio, while debt to equity ratio gave negative and no significant effect on Market to Book ratio. Meanwhile, debt to equity ratio gave positive and significant effect on sales growth, and size did not influence the sales growth.*

**Keywords:** capital structure; research and development; firm size; sales growth; investment opportunity set.

### 1. Introduction

Trade off theory is the relationship between taxes, bankruptcy risks and the use of debt due to capital structure decisions taken company (Haugen et al., 2015). Decision making funding is expected to give a greater positive impact compared to the costs incurred so as to improve the performance of companies in various fields. When viewed from the side of the performance of the funding decision-making ratio is expected to increase the activity ratio, especially the increase in sales of the company, which in turn can increase profitability. The domino effect of increasing profitability is expected to be captured by investors as a signal that the company has good prospects so that they want to invest in the company.

Investment opportunity sets are investment decisions in the form of asset-in-place combinations and growth options in the future (Myers, 1977). According to Kallapur & Trombley (2001) growth is the company's ability to increase size, while investment opportunity sets are an option to invest in projects that have a positive net present value. According to both researchers, investment opportunity sets also increase the size of the company, while not all growth opportunities have a positive net present value.

Research and development (R&D) activities undertaken by the company are part of innovation activities that are strategies to compete in a competitive market. Kumar & Saqib (1996) states that R&D spending will increase the size of the company. Research and development (R&D) activities provide an opportunity for companies to build sustainable competitive advantage, which ensures survival and profitable growth. This can be achieved through a consistent R&D investment policy that takes into account internal company conditions, competencies and the external environment. The literature on the relevance of the value of R&D activities generally indicates a positive relationship between R&D investment and value creation (Chauvin & Hirschey, 1993).

Investment decision taken by firms can be applied in many

fields; one of them is technology. The dynamic and competitive business environment that always evolves demands firms to always follow the development of technology and apply it in productivity activity at firms. Yildizet al. (2013) tested the relationship between innovation performance and technology investment that gives the result of strong relationship in technopolis firms in METU (*Middle East Technical University*) and *Hacettepe University* in Turkey. In multinational company, investment in R&D in parent company will give motivation used as base of investment in foreign market as a multinational firm and later will expand the firm size. Investment in technology for foreign market and continuous R&D in parent company is a strategy done by multinational company to penetrate the market (Huang, 2013).

R&D intensity is the value expected by many people, both internal and external (signaling theory). The availability of R&D intensity reflects the condition where the firm has signal on stock price in the future to increase the firm value. From the investors' point of view, the growth of a firm is a sign that it has profitable aspect, and the investors expect good rate of return from the investment. The result suggests the management to be brave to take aggressive act in funding policy. This policy followed by investment on fixed assets, those are assets that are profitable, and the investment on R&D is proven to increase the firm value, so the prosperity of the owners can be reached through the function of finance management.

The financial decision is one of the important and integral parts of financial management in every firm. A good decision must consider the scope of capital structure, capitalization, and capital cost. Capital structure is a significant thing for management because it affects the mix of debt and equity of the firm which influences the return of stakeholders and risk. So, deciding the debt combination and equity plays main role in the part of firm value and stock market value. Based on the theory of *trade-off* (DeAngelo & Masulis, 1980; Fama, Eugene F. and Miller, 1972; Jensen, 1986; Myers, 1977) the choice of firm funding reflects the effort of the manager to balance the tax-shield

from bigger debt by improving the possibility of financial distress cost. The use of debt is another mechanism used for reducing or controlling the agency conflict (Jensen & Meckling, 1976). The capital structure of a firm describes the way in which a firm raised capital needed to establish and expand its business activities. It is a mixture of various types of equity and debt capital a firm maintained resulting from the firm's financing decisions. In one way or another, business activity must be financed. In all aspects of capital investment decision, the capital structure decision is the vital one since the profitability of an enterprise is directly affected by such decision (Claude, 2016).

Research on the influence of capital structures has been done, but not much to do with R&D, sales growth and IOS, most research on capital structure is always linked to its influence on stock returns and firm value. This research tries to expose capital structure with relevance to R&D which in Indonesia itself still needs attention (expenditure on average R&D is only 0.20%).

## 2. Literature review and hypothesis development

The management of finance is related to an important decision taken by firm and a combination from funding decision, investment decision, and dividend policy of maximizing firm value (Mbodja & Mukherjee, 1994). Investment Opportunity Set (IOS) is the availability of alternative investment in the future for the firm. IOS is the current value of firm's choices to make investment in the future (Chung, Wright, & Charoenwong, 1998). Investment decision is defined as a combination from owned assets (assets in place) and choices of investment in the future with positive net present value (Myers, 1977). IOS gives wider clue where firm value depends on the expenses in the future. So the prospect of the firm can be estimated from *Investment Opportunity Set* (IOS).

There is tendency that large companies easier to enhance corporate value. A big firm has more accurate estimation on profit, it is because it has various business lines and wider market. Besides, big companies have more resources to improve the firm value because they have better access to external information sources than those of small ones. Ota (2003) showed that a manager from big companies have strong commitment on profit estimation. Dastgir et al. (2007) explained that big companies have greater control on market situation, so they can face the competition resulting in less affected by economic fluctuation.

Mudambi & Swift (2011) explained that big firm, R&D expenses and the level of firm's development have strong relationship, while for a small firm the relationship is weak. Klette & Griliches (2000) presented the quality of firm's development level model where the investment of R&D and stochastic innovation is the machine of growth. Qiao, Ju, & Fung (2014) in the research showed that the existence of R&D and technology have positive and significant effect to the innovation of SMEs. The most important finding is that innovation at SME gives positive effect on firm's performance. Zhu & Huang (2012) described the innovation technology and R&D are the core of business strategy of a firm to compete in market. The research done was to test the relationship between investment and the intensity of R&D and the firm's performance in China to show result that companies with intensive investment on R&D would have higher finance performance than the previous year. Chun et al. (2014) emphasizes the importance of R&D investment to support the long-term development of the firm. Li (2011) stated that there is a strong relationship between financial constraint, R&D intensity, and stock return. R&D intensity can predict and operate stock return of the firm to the positive direction.

The effect of sales growth on R&D Intensity is negative and significant, this result is consistent with Schimke and Brenner (2011) suggesting that there is a different finding between

company growth and R&D, for low technology firms, the relationship between firm growth and R&D is negative, whereas for companies with high technology, the relationship between company growth and R&D is positive. This study is inconsistent with Goedhuys and Veugelers (2011). Coad & Rao (2010) explained that the company is increasing its expenditure for R&D if the company's sales growth.

### 2.1. Hypotheses for capital structure and investment opportunity set

Jensen & Meckling (1976), also describe that manager's decision to determine the capital structure is to keep the balance of obligation with the firm's own money, and minimize the effect given by those to the value of the firm. DeAngelo & Masulis (1980) explain that in the *static trade off theory*, the optimal capital structure happens because of the process of trade-off between *tax shield of leverage cost of financial distress and agency cost of leverage*. Decision making funding is expected to increase the set of investment opportunities (IOS). Khanqah & Ahmadnia (2013) in his study found that capital structure has a significant positive effect on ios (M/B), while Assih (2014) explains that the relationship between ios and der is a positive relationship. Meanwhile, Aitimon (2017) found that capital structure had a significant negative effect on IOS, another study also explains that leverage relationship with IOS is a negative relationship (Gul & Kealey, 1999). Lang et al. (1996) also found a negative leverage relationship with growth opportunities.

**H1. Debt to equity ratio has a negative impact on market to book ratio**

### 2.2. Hypotheses for Firm size and investment opportunity set

Large companies have an easy opportunity to access the capital market, thus having the flexibility and the ability to obtain larger funds. Alnajjar & Riahi-belkaoui (1999) suggest the relationship between corporate reputation, multinationality, size and profitability with a set of investment opportunities is positive and negatively related to leverage and systematic risk.

**H2. Firm size has a positive impact on market to book ratio**

### 2.3. Hypotheses for R&D and investment opportunity set

Myers (1977) explained that firm value is not determined by the debt proportion but it is determined by the combination from investment opportunity set and placed asset. IOS is determined by the choice where the business line is based on the competitive excellence, so the value of the firm is determined by the expenses arranged by the management in the future, which are the investment that is seen to give greater profit (Gaver & Gaver, 1993; Smith & Watts, 1992). Elkemali et al. (2007) Shows that firms issuing R&D intensity show lower levels of leverage, shorter debt maturities, lower dividends and payments and higher cash rates. Nekhili et al. (2016) found a positive but insignificant relationship between R&D and market value of equity firms. Kayo et al. (2016) describes a positive relationship between R&D and M/B.

**H3. R&D Intensity has a positive impact on market to book ratio**

### 2.4. Hypotheses for sales growth and investment opportunity set

Jannati et al. (2014) in his research argued that the increase of banking growth is expected by both internal and external community. High-growth banks need more money because of the many investment opportunities they will make. The funds

can be obtained; One of them with stock sales. Improvement, banking growth is expected to increase investment, while the positive impact of banking growth for investors is the high return on investments invested. So it can be concluded that the relationship between growth with the availability of investment opportunities is positive.

**H4. Sales growth has a positive impact on market to book ratio**

## 2.5. Hypotheses for capital structure and sales growth

Thippayana (2014) in his review found that capital structure is an important factor for a firm to produce assets, to operate the firm, and to improve the growth in the future that leads to maximize the firm value. The leverage improvement can improve the firm size but can reduce the profitability significantly. Khanqah & Ahmadnia (2013) found in his research that the capital structure had a significant negative effect on sales growth.

**H5. Debt to equity ratio has a positive impact on sales growth**

## 2.6. Hypotheses for size and sales growth (BELUM)

Gaur & Kesavan (2014) explains that the high low sales growth is dependent on the size of the company. While concluded that company growth is more influenced by the level of the company's ability to generate profits, not influenced by the

size of the company. Farrokh & Kordnaeij (2016) describes the factor factors that affect the growth of the company that is : 1) Structural factors: business processes, vision, clear strategy, the amount of innovation, organizational learning, organizational risk-taking, age, organizational structure, technical capacities, 2) Behavioral factors: investment in human resources, management competence, entrepreneurial judgment (knowledge of entrepreneurship, opportunity recognition and growth motivation, proactivity), and 3) Contextual factors: governance structure and government support, industry related factors, environmental characteristics (dynamics, heterogeneity, hostility and munificence), competing in the environment.

**H6. Size has a positive impact on sales growth**

## 3. Research methodology

This section is devoted to discuss the data sources, sampling design and the empirical model tested in this study.

### 3.1. Data collection and sources

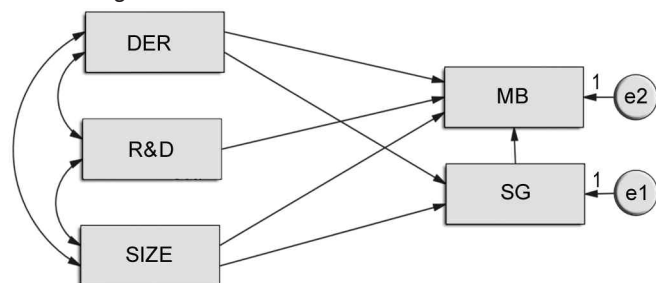
The type of data used is quantitative ones gathered from; (1) *Indonesian Capital Market Directory (ICMD)*, published in 2008-2017; (2) Annual report. Based on time dimension and order of time, this research is a cross-sectional and time series or known as data panel (data pooled). The sample firms are those which have R&D expenses, including *research and development* (R&D) cost, education and training, and human resources development. The data of the firms used as population are 243 manufacture firms in 10 years.

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Table 1. Research Data Collection Process Authors' tabulation	<b>The number of manufacture firms registered in Indonesia Stock Exchange</b>									
	141	139	134	135	139	138	141	143	143	143
	<b>The number of manufacture firms expensing R&amp;D based on PSAK 19</b>									
	23	23	24	24	25	29	28	22	22	23
<b>The numbers of manufacture firms used as data of research</b>										
	13	13	14	15	17	22	19	17	17	14

Table 1 showed the process of qualified samples gathering and the result is there are 161 manufacture firms.

### 3.2. Empirical model and variables measurement

The research was focused on the empirical test of variables integration related to the investment opportunity set involving capital structure, firm size, and research and development mediated by sales growth. The model of empirical study presented in figure 1.



Both sub structure formed in figure 1 are; **First**, sub-structure stated causal relationship of variables DER, SIZE, R&D, and SG with M/B variable; **Second**, sub structure shows the causal relationship between variables DER, and R&D with Variable SG. In other words, based on both sub-structures, there are 2 structural equations formed:

$$\frac{M}{B} = \beta_{1M} \frac{SIZE}{B} + \beta_{2M} \frac{R\&D}{B} + \beta_{3M} \frac{DER}{B} + \beta_{4M} \frac{SG}{B} + \varepsilon_1 \quad (1)$$

$$SG = \beta_{1SG} \frac{DER}{B} + \beta_{2SG} \frac{SIZE}{B} + \varepsilon_2 \quad (2)$$

Research and development uses the measurement from the intensity of R&D where total expenses of R&D divided by total assets of the firm (Chun et al., 2014; Li, 2011; Zhu & Huang, 2012). *Debt to Equity Ratio* is an effort to show, in other format, relative proportion of lenders claim on ownership right, and used as measurement of debt role as an indicator of capital structure (Cheng, Liu, & Chien, 2010; Cuong & Canh, 2012). Factual approach chosen for investment opportunity set was *market to book ratio* (Assih, 2014; Yuliani et al., 2012). The sales growth is the ratio of sales change divided by previous year sales (Dunne & Hughes, 1994). The firm size in this study was measured with natural logarithm of total assets (Chen & Chen, 2011; Dastgir, et al., 2007; Fosu, 2013; Hou Loi & Khan, 2012; and King & Santor, 2007).

Variable	Name of the variable	Operationalization	Expected sign
M/B	Market to book ratio	The ratio of market value by firm to total equity	
R&D	Research and Development	Total expenses of R&D divided by total assets.	+
DER	Capital Structure	The ratio of total debts owned by firms to total equity.	+
GS	Growth sales	The change of total sales divided by sales.	+
SIZE	Firm size	Logarithm Natural by total assets	+

Table 2. Summary of the variables

A descriptive statistics for variables are shown in Table 3. On average, the M/B data in Indonesia reach 2.06 with the highest M/B value is 7.32 and the lowest is 0.12. While for R&D, the average is 0.2038% with the highest R&D is 1.0779% and the lowest is 0.0004%.

Variable	Minimum	Maximum	Mean	Std. Deviation
DER	.1248	2.4622	.711342	.5370104
SIZE	11.4633	17.6048	14.531814	1.4504559
R&D	.0004	1.0779	.203853	.2083161
SG	-23.9100	56.7560	12.350361	15.0732490
M/B	.1201	7.3201	2.056228	1.6881642

Table 3. Descriptive statistics

Table 4 shows Pearson correlation matrix and Vector Inflation Factor (VIF) among the variables. The results indicate that all variables are far from being correlated. The maximum correlation coefficient is 64.90% between M/B and SIZE which indicates positive and significant correlation. While the lowest correlation is 1.00% between SIZE and DER which indicates positive and no significant correlation.

VARIABLES	M/B	DER	SIZE	R&D	SG
M/B	1				
DER	-.099	1			
SIZE	.649	-.001	1		
R&D	.001	.026	-.124	1	
SG	.117	.252	.135	-.053	1

Table 4. Pearson correlation matrix

## 4. Empirical findings

Initially, we estimate the path analysis using AMOS. The results are reported in Table 5.

			Estimate	S.E.	C.R.	P	Label
SG	<---	DER	.252	2.126	3.333	***	par_8
SG	<---	SIZE	.135	.787	1.789	.074	par_9
MB	<---	SIZE	.651	.070	10.850	***	par_4
MB	<---	R&D	.088	.483	1.485	.138	par_5
MB	<---	DER	-.117	.192	-1.916	.055	par_6
MB	<---	SG	.063	.007	1.027	.304	par_7

Table 5. Output path analysis

From table 5, there are two standardized structural equation formed.

$$M/B = 0.088 \text{ SIZE} + 0.651 \text{ R\&D} - 0.117 \text{ DER} + 0.063 \text{ SG} \quad (3)$$

$$P \quad (0.000) \quad (0.138) \quad (0.055) \quad (0.304)$$

$$Cr \quad (10.850) \quad (1.485) \quad (-1.916) \quad (1.027)$$

$$SG = 0.252 \text{ DER} + 0.135 \text{ SIZE} \quad (4)$$

$$P \quad (0.000) \quad (0.074)$$

$$Cr \quad (3.333) \quad (1.789)$$

Based on the structural equation 3, the test result of hypothesis. The influence of firm size to M/B is positive and significant effect. The results of this study indicate that the larger the size of the company can increase investment opportunities. These results support the statement of Alnajjar & Riahi-belkaoui (1999) which states that large companies have easy access to capital markets, and thus have the flexibility and ability to obtain larger funds, which causes the effect of firm size on IOS is positive.

The influence of R&D to M/B is positive but no significant effect. So, R&D has less meaning to decreases M/B. These results support research conducted by Kayo et al. (2016) which explains the positive relationship between R & D activities and Investment opportunity set (IOS). Gaver & Gaver (1993) that stated investment choice in the future is not only on the projects

funded by R&D but also the ability to explore the opportunity to get profit. The existence of investment opportunity set gives positive signal to R&D activity (signaling theory). The investment in technology for foreign market and continuous R&D in parent company is the strategies applied by multinational company to penetrate the market (Huang, 2013).

The influence of debt to equity ratio to M/B is negative but no significantly influence. Debt to equity ratio which became samples in this research has influence of improving M/B if the debt to equity ratio decreases. This result supports the one done by Hassan & Aitimon (2017); Gul & Kealey (1999); and Lang et al. (1996). But it is inconsistent with researches done by Khanqah & Ahmadnia (2013) and Assih (2014) explains that the relationship between DER and IOS is a positive relationship.

The influence of sales growth to M/B is positive but no significant. From the investor's point of view, the growth of an enterprise is a sign that the company has a favorable aspect (Frank & Goyal, 2010), and investors will expect the rate of return of investments to show good progress. This research is in line with Jannati et al. (2014) which states that the growth of the company is a value of expectations from internal and external companies that can increase investment opportunities.

Structural equation 4 shows that the influence of debt to equity ratio to sales growth is positive and significant effect. It means that the raise of debt to equity ratio can increase sales growth significantly effect. The study supports trade off theory, which states that in the company's financing policy it will seek to balance between the benefits of tax savings and bankruptcy costs. Thus the company can increase its operational activities to generate profits by increasing the company's sales. This study supports Thippayana (2014) which states that Capital structure is an important factor of the firm to produce assets, run the operational things, and improve the development of the firm. However, these results do not support research conducted by Khanqah & Ahmadnia (2013) found that capital structure had a significant negative effect on sales growth.

The influence of size to sales growth is positive but no significant. The results of this study reinforce the findings of Bano et al. (2012) which explains that firm size is not the determinant factor of company growth rate, but profitability more determining the size of company growth. The results of this study also support Gaur & Kesavan (2014), but do not support the results of studies from Farrokh & Kordnaeij (2016).

The test result of mediation variables of sales growth of the effects of DER, and SIZE to M/B are; **First**, sales growth is able to mediate the effect of DER on M/B perfectly. The study is based on the fact that the effect of DER on M/B directly is negative and significant at 10% trust level and the effect of DER on M/B indirectly through sales growth is positive, although the result of the test is not significant because t count 0.309217 smaller than t table which is equal to 1.65449 (0.309217 < 1.65449). This does not reduce the fact that the company's decision to increase debt can increase IOS, if the company is able to increase sales. **Second**, sales growth did not mediate the influence of SIZE to M/B with t-test result 1.09899 smaller than t- table 1.65449. The results of this analysis are reinforced by the result of SIZE direct impact test against M / B is greater than the effect of SIZE to M / B through sales growth (0.651 > 0.009).

## 5. Conclusion and implications

What's interesting about this is the test results, sales growth able to mediate the effect of DER against M/B when seen from the direct influence of the DER and M/B variable is negative, while the indirect effect of the variable DER and M/B mediated by sales growth is positive. It is clear that sales growth able to mediate the effect of DER against M/B. This finding also gave input to trade off theory, with debt so the purpose of management to optimize the debt can raise the investment opportunity set.

The second important finding is the influence of size on M/B

is a direct influence, because it is proven that the influence is positive and significant, so that the sales growth variable is not able to mediate. This indicates that the size of the company's

sales is not influenced by the SIZE of the company, but more influenced by the level of profitability obtained by the company (Bano et al., 2012).

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