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Determinant Factors of Firm Risk - Using the Structural Equation Modeling Approach: Evidence from Indonesia

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Abstract

The purpose of this study was to determine the relationship between company risk and factors such as business size, ownership structure, and leverage. The study was conducted on 142 manufacturing sector companies listed on the Indonesia Stock Exchange from 2013 to 2018. The purposive sampling method was used to select the research sample. The sample size for this study was 21 different companies. The analytical approach uses Structural Equation Modeling (SEM) with WarpPLS. According to the findings of the investigation, the size of the company has a significant influence on both the amount of leverage the company uses and the amount of risk the company takes. The level of leverage is significantly influenced by the ownership structure. However, the ownership structure does not have a significant impact on the level of risk the company; rather, leverage has a big impact on the level of risk the company faces. The findings of this study are helpful to prospective investors in measuring the risk posed by the company to make judgments regarding investments. The findings of this study are also essential for management to consider while controlling the risk of the organization.

Keywords: Firm Size, Ownership Structure, Leverage, Firm Risk, Structural Equation Modeling

JEL Classification Code: F65, P45, O16, M39

1. Introduction

A company is a tool a certain person or group uses to get the maximum benefit. Concerning these objectives, an accurate and realistic plan is needed that follows the company's conditions because the procedure can predict the company's performance (Shtern et al., 2015). Performance predictions are expected to be input for decision-making by the leadership.

Good company management is needed to carry out the plans that have been made. The more complex a company requires more professional management. The separation between owners and management is very important in the management of large companies. The growth in business assets acted as a mediator, mitigating some of the negative effects of excellent corporate governance on the financial performance of banks in Indonesia. These effects were partially reduced by the growth in company assets. The increase in firm assets assisted in mitigating the size of the detrimental impact that GCG had on the financial performance of the bank (Markonah, 2020; Trung & Nguyen, 2022).

As the subject of this research, the manufacturing companies that were traded on the Indonesia Stock Exchange between the years 2013–2018 served as the object of the study. The essential data refers to the research results (Suryadi et al., 2021; Widarjono et al., 2021). Based on research (Ahmed et al., 2019), intellectual capital is more influential in improving business performance in the manufacturing industry compared to the service industry. The manufacturing industry can better convert individual employee knowledge into technical knowledge in the utilization of machine tools and so on. The manufacturing industry also has an important

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role in the economy of Indonesia. This is clear when looking at the percentage that the manufacturing sector contributes to the overall Gross Domestic Product (GDP). The worth of all the goods and services that are generated within a country is measured as its GDP.

The purpose of this study is to investigate the effect that a number of variables, which are characteristics of the company, such as firm size and ownership structure, have on other variables, particularly leverage, intellectual capital disclosure, and firm risk. Specifically, the purpose of this study is to examine the effect that these variables have on firm risk. The overarching theory that guided this research was financial management. This theory encompassed a number of sub-theories, such as financial theory for agency theory, trade-off theory, and signaling theory, in addition to earlier research that was used to examine the findings of this study.

The analytical technique used is Structural Equation Modeling with WarpPLS. The analysis in this study uses three exogenous variables, namely firm size, ownership structure, and leverage on firm risk. The size of a corporation, often known as the firm's size, is a measurement that can be used to represent a state or attribute of an organization or company. The size of a company, which can be classified as either large or small, can be determined using a number of different parameters, such as the number of employees who are responsible for carrying out the company's operational activities, the number of assets that the company owns, the total sales that the company achieves in a given period, and the number of shares that are currently outstanding. These parameters can be used to determine the size of a company (Polychroniou & Trivellas, 2018; Kwarteng & Aveh, 2018; Bakhsh Magsi et al., 2018). The second exogenous variable in this study is the ownership structure which is the ownership portion of a company based on the percentage of shares owned, namely the comparison between the number of shares owned by insiders and the number owned by external investors (Maqbool & Zameer, 2018; Coles & Li, 2019). The percentage of ownership is determined by the percentage of the total number of shares of the company. A person who owns shares of a company can be said to be the company owner even though the number of shares is only a few. The ownership structure describes the composition of a company's share ownership, whether government, institutional or public, foreign, family or managerial. Ownership structure affects leverage closely related to the company's capital structure (Obeidat et al., 2021). Increased managerial ownership, which is a source of more capital, comes from own capital, namely from members of management, not from debt; conflicts between managers and shareholders are likely to be resolved and consequently encourage managers to reduce debt (Jensen & Meckling, 2019). Leverage affects the disclosure of the use

of intellectual capital in the company. Leverage is one of the policies that must be taken by companies that are included in the funding policy, namely the policy of focusing on the composition of funding or capital of a company (Kadim et al., 2020). For companies that experience a shortage of internal funding sources, the company can use external funding sources, namely through issuing shares or using leverage.

This study intends to use agency theory (Jensen & Meckling, 2019) to explain the influence of several variables. In addition to agency theory (Jensen & Meckling, 2019), this study also discusses trade-off theory (Modigliani & Miller, 1958; Lane, 2009; Jahanzeb et al., 2013; Jaros & Bartosova, 2015) and Signaling Theory (Spence, 1973; Kübler et al., 2008; Hopkins, 2012; Alós-Ferrer & Prat, 2012; Daley & Green, 2014) as a theoretical framework for testing research hypotheses. The following is a brief description of previous research using the theoretical framework. The factors that influence firm risk have become the attention of researchers. Previous researchers have studied the effect of firm size on leverage (Spence, 1973; Margaritis & Psillaki, 2010; Al-Thuneibat, 2018; Chadha & Seth, 2021) and firm size on firm risk (Rutkowska-Ziarko, 2015; Chaibi et al., 2015; Alioui & Bing Xiao, 2015). Researchers have tested the effect of ownership structure on firm risk (Slovin & Sushka, 1993; Wright et al., 1996; Seifert et al., 2005; Coles et al., 2012; Iswajuni et al., 2018; Gadhoun & Ayadi, 2003). The results show that, in general, the ownership structure is associated with firm risk. Conflicts of interest between the principal and the agent may arise due to excess cash flow. Stockholders prefer high-risk investments that also yield high returns, while management prefers investments with lower risks. In addition, leverage is also predicted to affect firm risk (Bhatti et al., 2010; Mirza et al., 2016; Ramadan, 2012; Iqbal & Shah, 2012). According to signaling theory (Spence, 1973; Kübler et al., 2008; Hopkins, 2012; Alós-Ferrer & Prat, 2012; Daley & Green, 2014), an increase in the level of corporate leverage will be accompanied by an increase in the company's risk of bankruptcy. High leverage signals that the company's ability to generate profits is low because it has an obligation to repay the loan principal and interest, causing its risk to be high.

2. Literature Review

2.1. Firm Size and Leverage

The notion of trade-offs (Modigliani & Miller, 1958; Lane, 2009; Jahanzeb et al., 2013; Jaros & Bartosova, 2015) shows that large companies should have more debt due to the risk that these companies are more diversified, less likely to declare bankruptcy, and have relatively low bankruptcy costs. This is because large companies are more likely to be able

to service their debt. Additionally, huge corporations have reduced agency costs from debt. For instance, monitoring costs are relatively low due to less sensitive cash flows and quick access to financial markets. This is another advantage that large corporations enjoy. According to this conclusion, there is a positive connection between the size of the firm and leverage.

Previous research conducted by several researchers (Al-Thuneibat, 2018) used firm size as an exogenous variable and leverage as an endogenous variable in the context of companies in India. The result of this study is that size has a very significant positive effect on the leverage ratio. A similar study was also conducted by Margaritis and Psillaki (2010) using firm size as an exogenous variable and capital structure as an endogenous variable in the context of Jordan. The result of this study is that Size has a very strong positive influence on leverage. According to the findings of this research, size exerts a very significant and favorable influence on leverage. According to the findings of the study (Al-Najjar & Taylor, 2008), the size variable is treated as an exogenous variable in the Karachi corporate environment, whereas the debt ratio is treated as an endogenous variable. According to the findings of this research, the size of the company has a significant positive impact on the debt ratio. This research proposes a hypothesis about the relationship between business size and leverage based on the description provided above.

H1: Firm size influences leverage.

2.2. Firm Size and Firm Risk

The signaling theory assumes that companies with good performance use financial information to convey signals to the market (Spence, 1973; Kübler et al., 2008; Hopkins, 2012; Alós-Ferrer & Prat, 2012; Daley & Green, 2014). Large corporations have a better potential to generate profits than smaller ones, which translates to a lower level of investment risk.

Rutkowska-Ziarko (2015) used risk as an endogenous variable and company size as an exogenous variable. According to the findings of the study (Rutkowska-Ziarko, 2015), the size of a company has a detrimental impact on the level of investment risk in the stock market. The standard deviation, which measures the amount of variation in a variable, shows that large companies have less variation in their rates of return. This means that business risk is higher for small companies than for large ones. Chaibi et al. (2015) and Alioui and Bing Xiao (2015) conducted a study with firm size as an exogenous variable and risk as an endogenous variable. According to the findings of this research, the size of an organization has a detrimental impact

on risk. The risk is higher for small companies than for large companies. Previous research was also conducted by Iqbal and Shah (2012), with firm size as an exogenous variable and systematic risk as an endogenous variable. The results of this study are firm size has a significant negative effect on systematic risk. Based on the description above, a research hypothesis is firm size influences firm risk.

H2: Firm size influences firm risk.

2.3. Ownership Structure and Leverage

Jensen and Meckling (2019) stated that in Agency theory, managers have a natural predisposition to make decisions that are to their own best advantage, which may conflict with the opinions of outsiders. This is because managers are motivated by their own self-interest. In light of the fact that they run the danger of not diversifying their personal wealth, interested managers are urged to bring their corporations' levels of debt down to a level that is lower than the level at which value is maximized. However, as managerial ownership increases, the likelihood of disagreements between managers and shareholders being addressed increases (Jensen & Meckling, 2019). As a result, the incentives for managers to lower debt decrease as managerial ownership increases. The relationship between management ownership and debt is one that has a detrimental impact.

Ganguli (2013) and Tarchouna et al. (2022) conducted a study using the ownership structure variable as an exogenous variable and capital structure as an endogenous variable. According to the findings of this study, ownership structure has an effect on capital structure, but not the other way around. In line with the theoretical assumptions that a favorable effect will result from leverage being applied to concentrated stockholders. Pushner (1995) conducted a study using the equity structure variable as an exogenous variable and leverage as an endogenous variable in the context of companies in Japan. This study results in a negative effect on the direct ownership and a significant positive effect on the corporate ownership of the leverage. Pindado and De La Torre (2011) found a significant positive effect between managerial ownership and leverage. Using regression analysis, they used managerial ownership variables as exogenous variables and leverage as endogenous variables in the context of large companies in Japan, in this study. Dzulkrirom et al. (2016) conducted a study using the ownership structure variable as an exogenous variable and capital structure as an endogenous variable. According to the findings of this investigation, the ownership structure has a negative impact on the capital structure. The research hypothesis is that ownership structure has an effect on leverage, based on the description that was just given.

H3: *Ownership structure influences leverage.*

2.4. Ownership Structure and Firm Risk

The Agency Theory (Jensen & Meckling, 2019) postulates that when there is an excess cash flow, there may be a conflict of interest between the principal and the agent. The majority of a company's excess cash flow is often allocated to investments in fields that have absolutely nothing to do with the business's main operations. Because shareholders favor investments with high levels of risk and high levels of return while management supports investments with lower levels of risk, this creates a conflict of interest between shareholders and management.

Wright et al. (1996) and Seifert et al. (2005) conducted a study using the equity ownership structure as an exogenous variable and firm risk as an endogenous variable. According to the study's findings, few equity insiders have a significant impact on the business's risk. However, when an insider increases their investment, the risk to the company is significantly reduced. Coles et al. (2012) and Iswajuni et al. (2018) conducted a study using managerial ownership as an exogenous variable and risk-taking as an endogenous variable. The result of this research is that there is no significant effect between managerial ownership and risk-taking. The implication is that large amounts of managerial ownership offer outsider owners comfort and security against decisions that could lead to potential bankruptcy. This does not provide the impetus for managers to act more efficiently to maximize in management of the company in the owners' best interests.

Mahdavi et al. (2012) conducted a study using the ownership concentration variable as an exogenous variable and risk-taking as an endogenous variable. The results of this study did not verify the existing view of the monitoring role of shareholders. The Institutional in management decisions. Gadhoun and Ayadi (2003) conducted a study using the ownership structure variable as an exogenous variable and the risk variable as an endogenous variable. The result of this research is that there is a significant negative effect between total risk and ownership structure. Based on the description above, a hypothesis is that ownership structure influences firm risk.

H4: *Ownership structure influences firm risk.*

2.5. Leverage and Firm Risk

According to the signaling theory proposed by Spence (1973), an increase in the amount of leverage a company maintains would be accompanied by an increase in the chance that the company will declare bankruptcy. When a corporation has high leverage, it means that a greater

proportion of its funding comes from debt, which leads to high fixed costs in the form of interest expenses. A high level of leverage is an indication that the company has a limited capacity to make earnings. Because of this, the corporation is exposed to a significant amount of risk.

In a study by Bhatti et al. (2010), the risk variable was taken as the endogenous variable whereas the leverage variable was treated as the exogenous variable. High levels of risk brought about by significant leverage directly contribute to the high levels of price volatility experienced on the Karachi stock exchange.

In the study that was carried out by Ramadan (2012), leverage was considered to be an exogenous variable, whereas company risk was considered to be an endogenous variable. The findings of this study indicate that leverage possesses both a significant positive connection with systematic risk as well as an influence that is considerable on systematic risk. In Jordan, the term "risk" refers to the use of leverage by industrial businesses. It's not always a bad thing to take chances, especially when there's the possibility of making a lot of money. This result is consistent with the conventional capital structure theory, which states that a linear capital structure with more risk has a higher level of debt than a capital structure with lower risk.

In the study that was carried out by Iqbal and Shah (2012), leverage was considered to be an exogenous variable, while the systemic risk was considered to be an endogenous variable. The findings of this research indicate that leverage does not have a substantial impact on systemic risk. The idea behind this hypothesis, which is based on the description, is that leverage has an effect on firm risk.

H5: *Leverage affects firm risk.*

3. Research Method

The manufacturing companies that were listed on the Indonesia Stock Exchange between the years 2014 and 2018 make up the population for this study. The manufacturing sector consists of 66 companies in the Basic and Chemical Industry sector, 39 companies in the Miscellaneous Industry sector, and 37 companies in the Consumer Goods sector. So, the total population is 141 companies. By using purposive sampling obtained, 21 companies with five periods. The sample criteria used are companies included in the Jakarta Stock Industrial Classification (JASICA) version of the secondary sectors with criteria as knowledge-laden industries, according to the Organization for Economic Cooperation and Development (OECD), which have a high chance of implementing intellectual capital in their industry, namely sector code 4 (miscellaneous industry sector) and 5 (consumer goods sector) and consistently listed on the IDX in 2013–2018. The total number of samples is 105 firm

years. The analytical technique used is Structural Equation Modeling with WarpPLS.

The size of a corporation is referred to as its “Firm Size.” The total assets of a company, its total sales, and its market capitalization are all indicators of the firm’s size. The ownership structure of a corporation describes the distribution of the ownership stake in the business according to the proportion of shares held by each shareholder. The degrees to which management ownership, institutional ownership, and public ownership are present are markers of ownership structure. The utilization of funds obtained from sources other than the company itself is an example of leverage. Total debt in relation to total assets, long total debt in relation to total assets, total debt in relation to total equity, and the long total debt in relation to total equity are all indicators of leverage. The probability of obtaining a return that is lower than anticipated is referred to as the firm’s risk. The standard deviation of the return on investment (ROI), the standard deviation of the return on assets (ROA), and the standard deviation of the return on equity are all indicators of the risk that a company faces.

4. Result and Discussion

Figure 1 is a structural model for analyzing determinant factors of firm risk using the Structural Equation Modeling Approach with WarpPLS. The test data was used from 2013 to 2018 with 142 manufacturing sector companies listed on the Indonesia Stock Exchange. Descriptive data show that

firm size as proxied by total assets, total sales, and market cap increased from 2013–2018. Total sales experienced a very sharp increase until 2018. The ownership structure shows that in the 2013–2018 period, the average percentage is 0.47% managerial ownership, 76.99% institutional ownership, and 22.55% public ownership. Leverage shows that the company’s funding is mainly sourced from short-term debt, which is 86%, and the remaining 14% is funded from long-term debt. Meanwhile, Firm risk shows that of the three indicators, the ROI standard deviation has the highest average during 2013–2018.

Table 1 describes the study of hypotheses for the results of the analysis of the effect of firm size has an impact on leverage (H1), firm size has an effect on Firm Risk (H2), ownership structure affects leverage (H3), ownership structure has an effect on firm risk (H4), and leverage has an effect on firm risk (H5).

H1: The structural coefficient of -0.288 and the p -value of 0.001 indicate that the size of the firm has an impact on leverage. Because the p -value < 0.05 , it indicates that firm size has a significant effect on leverage. The structural coefficient of -0.288 shows a negative sign indicating the direction of influence between variables is opposite, meaning that increasing firm size will result in lower leverage or decreasing firm size will result in increased leverage. Based on the hypothesis testing analysis, the hypothesis that firm size affects leverage is acceptable.

H2: The structural coefficient for the relationship between company size and risk was -0.160 , and the p -value was

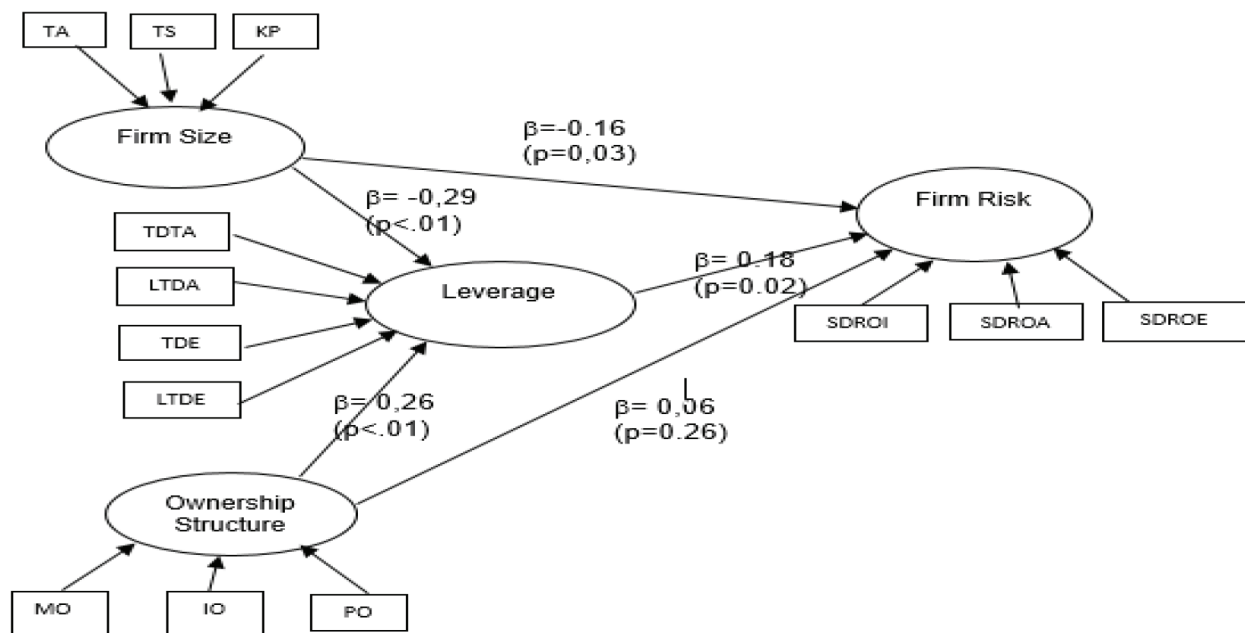


Figure 1: Structural Model

Table 1: Results of Hypotheses Testing

Hypothesis	Path Coefficient	p-value	Decision
Firm size influences leverage	-0.288	<0.001	Accepted
Firm size influences firm risk	-0.16	0.032	Accepted
Ownership structure influences leverage	0.26	0.001	Accepted
Ownership structure influences firm risk	0.056	0.264	Rejected
Leverage influences firm risk	0.179	0.019	Accepted

0.032. Because the p -value < 0.05 , it indicates that firm size has a significant effect on firm risk. The structural coefficient of -0.160 shows a negative sign indicating the direction of influence between variables is opposite in direction, meaning that increasing firm size will result in lower firm risk or decreasing firm size will result in increased firm risk. Based on the hypothesis testing analysis, the hypothesis that firm size affects firm risk can be accepted.

H3: Based on a structural coefficient of 0.260 and a p -value of 0.001 for the effect of ownership structure on leverage, it can be concluded that this factor significantly affects leverage. The structural coefficient of 0.260 shows a positive sign indicating the direction of influence between variables is unidirectional, meaning that the increasing ownership structure will result in increased leverage. Based on the hypothesis testing analysis, the hypothesis that ownership structure affects leverage is acceptable.

H4: The structural coefficient for the impact of ownership structure on company risk was 0.056 , and the p -value was 0.264 . Because the p -value > 0.05 , it indicates that the ownership structure has no significant effect on firm risk. The structural coefficient of 0.056 shows a positive sign indicating the direction of influence between variables is unidirectional, meaning that increasing ownership structure will result in increased firm risk, although not significant. Based on the hypothesis testing results analysis, the hypothesis that states that ownership structure affects firm risk is rejected.

H5: The structural coefficient for the relationship between leverage and company risk was 0.179 , and the p -value is 0.019 . When the p -value is less than 0.05 , it is clear that leverage significantly affects firm risk. The structural coefficient of 0.179 shows a positive sign indicating the direction of influence between variables is unidirectional, meaning that increasing leverage will result in decreased firm risk. Based on the hypothesis testing analysis, the hypothesis that states that leverage affects firm risk can be accepted.

The results of this study showed six important findings. First, it shows a significant effect between firm size and leverage. The findings in this study support the trade-off theory that firm size has a significant effect on leverage but with different directions of influence. The results of this

study indicate a negative direction, meaning that the larger the firm size will result in lower leverage. Conversely, the smaller firm size will result in higher leverage. This result is supported by descriptive data that there is a decrease in firm size followed by increasing leverage. The results of this study are also different from previous studies conducted (Margaritis & Psillaki, 2010; Al-Thuneibat, 2018; Chadha & Seth, 2021), using firm size as an exogenous variable and leverage as an endogenous variable in the context of companies in India. The result of this study is that size has a very significant positive effect on the leverage ratio.

Second, firm size has an acceptable effect on firm risk. The path coefficient is negative, meaning that the larger the firm size, the lower the firm risk, and vice versa, the smaller the firm size, the higher the firm risk. The results of this study support the Signaling theory (Spence, 1973; Kübler et al., 2008; Hopkins, 2012; Alós-Ferrer & Prat, 2012; Daley & Green, 2014), which assumes that companies with good performance use financial information to send signals to the market. Large companies can earn greater profits than smaller companies, so it will cause a smaller investment risk. The results of this study confirm previous research conducted by (Rutkowska-Ziarko, 2015; Alioui & Bing Xiao, 2015; Chaibi et al., 2015; Iqbal & Shah, 2012).

Third, ownership structure has a significant positive effect on leverage. These results are consistent with (Jensen & Meckling, 2019). The natural tendency of managers is to make decisions in their best interest, which may conflict with the opinions of outsiders. Given the risk of non-diversifying their wealth, managers are interested in reducing their firm's debt to levels below the value-maximizing level. When managerial ownership increases, the conflict between managers and shareholders is likely to be resolved (Jensen & Meckling, 2019), and the implication is that managers' motivation to reduce debt is reduced. This research has a significant positive effect supported by the increase in institutional ownership data, which is in line with the increase in leverage. This can be explained that institutional ownership has succeeded in pressuring managers by increasing debt to strengthen monitoring through debtholders. This result does not contradict previous studies (Ganguli, 2013; Tarchouna et al., 2022; Dzulkriom

et al., 2016; Pindado & De La Torre, 2011), which revealed that ownership structure has a significant impact on capital structure and specifically managerial ownership has a significant influence on leverage.

Fourth, ownership structure has no significant negative effect on firm risk. These results are irrelevant to agency theory (Jensen & Meckling, 2019). Agency theory reveals that conflicts of interest between principals and agents can arise because of excess cash flow. Management prefers investment with lower risk in utilizing excess cash flow. Meanwhile, shareholders prefer high-risk investments that also yield high returns. Previous research found that increasing ethical insiders' investment will reduce the company's risk significantly. Ownership structure has a significant negative effect on total risk (Wright et al., 1996; Seifert et al., 2005; Gadhoum & Ayadi, 2003). The results of this study show different results from previous studies. Increased ownership structure does not necessarily reduce firm risk. Although shareholders have a lower proportion in the company's ownership structure, the principal has the power to choose profitable investments with higher risk. This can cause the ownership structure to have an insignificant negative effect on firm risk.

Fifth, this study finds that leverage has a significant positive effect on firm risk. These results provide empirical evidence for signaling theory (Spence, 1973; Kübler et al., 2008; Hopkins, 2012; Alós-Ferrer & Prat, 2012; Daley & Green, 2014) which provides an argument for the relationship between the level of corporate leverage and corporate risk. Companies that rely more on debt to finance the company operations result in fixed costs in the form of higher interest costs and potential bankruptcy. These results are consistent with previous studies conducted by Bhatti et al. (2010) and Ramadan (2012). High leverage gives a signal that the company's ability to generate profits is low and the risk is high.

5. Conclusion

The results of this study strengthen the trade-off theory relating to the effect of firm size on leverage. In addition, it also supports signaling theory, relating to the influence of firm size on firm risk and leverage on firm risk. Support for agency theory is also produced by this study related to the effect of ownership structure on leverage.

Increasing the company's size will result in decreased leverage, and lowering the company's size will result in more leverage. The structural coefficient value for this relationship is -0.288 , indicating that firm size substantially affects leverage. The structural coefficient value of -0.160 for firm size will significantly affect firm risk, where increasing

firm size will decrease firm risk, or decreasing firm size will result in increased firm risk. The structural coefficient value of 0.260 will significantly affect the ownership structure on leverage, where increasing ownership structure will result in increased leverage. Ownership structure has no significant effect on firm risk if the structural coefficient value reaches 0.056 , where increasing ownership structure will increase the firm risk even though it is not significant. If the leverage structural coefficient value reaches 0.179 , it will have a significant effect on firm risk, where increasing leverage will result in lower firm risk

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