ASYMMETRIC INFORMATION IN NEW INVESTMENT: EVIDENCE IN INDONESIA

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Abstract: Intra-industry sectors are producers of asymmetric information, which in turn has an impact on capital structure decisions. The purpose of this study was to determine (1) differences in debt-equity ratio, growth opportunities, firm age, and firm size as firm characteristics and (2) differences in the effect of growth opportunities, firm age, and firm size on the debt-equity ratio between manufacturing and non-manufacturing firms. We collected 3,063 observation units consisting of 2,628 manufacturing sectors and 435 non-manufacturing sectors in the Indonesia Stock Exchange (IDX) and trimmed the data to eliminate the top and bottom 20%. Manufacturing firms are older and more stable, using their profitability to increase information disclosure. Although they produce lower asymmetric information, they do not prefer external financing as an effort to reduce intervention. In contrast, non-manufacturing firms have less tangible assets as a proportion of their total assets than manufacturing firms and therefore produce less asymmetric information of intrinsic value (tangible assets). As a result, manufacturing firms prefer debt issues over equity issues when financing new investments.

Keywords: asymmetric information, pecking order theory, debt and equity.

JEL Classification: G17, G31.

1 Introduction

The relationship between asymmetric information with capital structure has been an unsolved issue in finance. Paper initiated, the differences in the determinants of information asymmetry will produce differences in capital structure decisions. Paper by (Akerlof, 1970) explains that asymmetric information arises when one party has more information than other parties. If managers who possess more information act in the interest of shareholders, then the securities issued may experience mispricing. Securities issued by low-quality firms are overpriced, while those issued by high-quality firms are underpriced. Asymmetric information is produced by the presence of firm characteristics such as total assets (Myers and Majluf, 1984), growth opportunities (Lang, et al., 1996), dan age (Das and Roy, 2007; Ruffin, 1999). The paper has clarified that high-quality firms (with larger assets, more growth opportunities, and older age) and low-quality firms (with smaller size, fewer growth opportunities, and younger age) are producers of asymmetric information. As a result, high-quality firms are more incentivized to disclose financial information, leading to greater levels of asymmetric information compared to low-quality firms (Mustaruddin, et al., 2017; Sinha, 1993).

The presence of asymmetric information between managers and investors has an impact when a firm raises external capital for a new project, as it faces an adverse selection problem. Differences in the quality of firm characteristics cause securities issued by high-quality firms to be mimicked by low-quality firms, resulting in mispricing of the securities. Securities issued by high-quality firms are underpriced, while those issued by low-quality firms are overpriced. The adverse selection problem forms the basis of the Pecking Order Theory (POT), which explains the preference for issuing internal rather than external capital and the greater preference for debt over equity when funding new projects (Klein, et al., 2002; Myers and Majluf, 1984). The POT model has explained that the presence of asymmetric information occurs when the manager is more informed and acts in the best interest of old shareholders, which results

in equity issuance when it is overpriced. Managers will pass up projects with positive NPV if equity is undervalued by the market. Therefore, equity issuance for funding new projects will convey negative information to the market, and the price of equity will be underpriced when project announcements are made. Hence, POT suggests that underinvestment (passing up projects with positive NPV) can be avoided by issuing securities with a hierarchy in the level of risk. To sum up, the difference in the quality of firm characteristics between manufacturing and non-manufacturing firms has resulted in variations in capital structure decisions (Das and Roy, 2007). The sector with high-quality characteristics has less asymmetric information compared to the sector with low-quality characteristics. Therefore, managers will prefer internal funding (or riskless debt) over risky debt, and in turn, will have a preference for equity.

Indonesia is a bank-based economy (Warjiyo, 2015), so the tendency of each sector is to prefer debt over equity. When the capital market in Indonesia, as a developing country, is imperfect (Minovic, 2019), it produces more asymmetric information, and firms are likely to have banking access to financing. Various regulations have been issued to support information disclosure in the capital market to reduce asymmetric information (Financial Services Authority, 2020; Financial Services Authority No 13, 2015). Banking institutions are primary capital markets, and non-banks are secondary financing in new investments. In more detail, it has been observed that there was an increase in bank lending from 91.1% in 2009 to 92.2% in 2014, and only 7.2% of financing came from the capital market and the rest from non-bank financial institutions. We have conducted a concurrent testing of total assets (Myers, 1977), growth opportunities (Brito and John, 2002; Lang, et al., 1996), and firm age (Das and Roy, 2007) as a producer of asymmetric information. If disclosure information regulations are implemented better, the capital market will develop, and firms will prefer equity issues over debt issues.

The objective of the paper is to investigate the differences in the impact of the presence of asymmetric information related to assets, growth opportunities, and age on the variations in capital structure decisions between manufacturing and non-manufacturing firms. The rest of the paper is structured as follows. Section 2 presents a literature review on asymmetric information and the differences in capital structure decisions between manufacturing and non-manufacturing firms in new investments. Section 3 describes the research methodology, Section 4 presents the results and findings, and finally, Section 5 concludes the paper.

2 Literature review

2.1 Asymmetric Information

Asymmetric information was first introduced in the paper by Akerlof (1970) on the used-car market, where there are high-quality cars (plum, H-type) and low-quality cars (lemon, L-type). The main point of his paper is the assumption that full information produces balancing information, and under an imperfect market, produces asymmetric information or unbalanced information between sellers and buyers. When the seller values a plum at 90 and a lemon at 60, buyers are willing to pay 100 for a plum and 80 for a lemon. The result is that the market price for plum is between 90 and 100, and for lemon, it is between 60 and 80. In contrast, under asymmetric information, the used cars traded are half lemon and half plum. As a result, the expected value for used cars for buyers is 0.580 + 0.5100 = 90 (indifferent to lemon and plum), so the lemon seller is the winner, and the plum seller is the loser.

The lemon problem is indeed an important concept in corporate finance, particularly in the context of asymmetric information and the pecking order theory (Klein, et al., 2002). When managers issue securities for new financing, outside investors cannot observe the true quality of the firm, such as growth opportunities and firm size, due to asymmetric information. This leads to mispricing of securities, as outside investors are only willing to pay the average value. As a result, high-quality firms (H-type) are more likely to issue securities, as they have more valuable investment opportunities and can signal their quality by issuing securities. In contrast, low-quality firms (L-type) are less likely to issue securities, as outside investors are less willing to invest in their securities, leading to adverse selection. This phenomenon is known as the pecking order theory (Spiegel, 2019). The paper provides a numerical analogy to illustrate

the adverse selection problem. Suppose an entrepreneur with a new investment sells their firm, where a low-quality firm (L-type) generates a cashflow of 0 after 1 period and a high-quality firm (H-type) generates a cashflow of 100, with the distribution being uniform in the interval [0, 100]. With asymmetric information and equal probability for L and H-type, outside investors are only willing to pay the price of 50, which is the average cash flow. It is clear that only entrepreneurs in L-type will be willing to sell, not those in H-type. As a result, the average value of firm quality will be revised from [0, 100] to [0, 50] because investors anticipate mostly L-type firms being offered. Then, the resulting uniform distribution becomes [0, 50], and the average value becomes 25 out of 50.

Thus, asymmetric information produces an adverse selection problem; securities issued by firms with L-type will be overpriced and underpriced for firms with H-type. Firms with L-type can mimic H-type for securities issues to finance new investments. The presence of regulations in the disclosure of information in Indonesia results in less asymmetric information, so firms in financing prefer equity over debt issues. The next section will explain firm size (Myers, 1984) and growth opportunities (Brito and John, 2002) as producers of asymmetric information, thus determining the capital structure decision.

2.2 Asymmetric Information: capital structure decision of inter-industry

An adverse selection problem arises due to asymmetric information between managers and investors when financing new projects or investments. In their seminal paper, Myers and Majluf (1984) argue that if outside investors are less informed about the current value of a firm's assets than insiders, then the issuance of securities may be mispriced by the market, resulting in a preference for issuing debt over equity. Low-value firms can mimic the securities offered by high-value firms, leading to over- or undervaluation of securities issued by low-value firms compared to high-value firms (Klein, et al., 2002). Moreover, the adverse selection problem is exacerbated when L-type firms offer more securities in the market than H-type firms, as illustrated in Akerlof's (1970) analogy, where plum sellers avoid offering used cars due to their higher market price.

There may be differences in the factors that determine capital structure decisions (Das and Roy, 2007). Asymmetric information and agency costs in firm age are determinants of SMEs throughout their life cycle; they prefer internal financing first, followed by external financing in the pecking order (González and González, 2011). The asymmetric information perspective explains that there is a positive relationship between growth opportunities and leverage; firms with growth opportunities will require new financing more than a firm without growth opportunities (Degryse, et al., 2012). In more detail, when there is high asymmetric information in growth opportunities, SMEs tend to prefer issuing debt rather than equity for financing decisions. More specifically, studies have shown that profitability is relatively constant across different industries but firm size is a determinant factor in capital structure decisions. Large firms have less asymmetric information compared to small firms, making them more inclined to issue debt instead of retaining earnings. However, a post-liberalization study conducted in India revealed that capital structure decisions were not determined by intra-industry firm age, given India's bank-based country perspective. Nevertheless, several studies indicate that the level of asymmetric information in the characteristics of different sectors can lead to differences in life cycle determinants of capital structure decisions (Month and Yan, 2012; Rocca, et al., 2011; Yulianto, et al., 2021).

H1: there are differences in debt-equity ratio, firm size, growth opportunities, and firm age between manufacturing and non-manufacturing firms.

Since asymmetric information produces insiders who have superior information to outside investors, it creates an adverse selection problem if the firm issues external financing for new investment. Brito and John (2002) have concluded that growth opportunities involve asymmetric information until the growth is realized. Firms with illiquid growth opportunities, which are subject to asymmetric information, tend to issue securities rather than rely on internal financing.

There is a different type of asymmetric information that arises when outside investors cannot observe a firm's assets in place (total assets), which may create

moral hazard problems. In such cases, when an entrepreneur does not have enough money to finance new investments, investors prefer a debt issue over an equity issue. (Klein, et al., 2002; Myers and Majluf, 1984; Spiegel, 2019). The result is that firms with low asset value are more likely to finance their projects through equity issues because their securities tend to be overvalued. The entrepreneur benefits from the difference between the actual return and the cost of investment, as the actual value of the securities is greater than their nominal value. However, in such conditions, the securities only provide a smaller fraction of the total assets compared to the case where full information is available. Baxamusa, et al. (2015); EF Fama and French (2012) suggested that younger firms have more asymmetric information regarding future investments compared to older firms. This uncertainty about investments in younger firms causes outside investors to be unwilling to pay for the securities that have been issued. However, the announcement of returns from investments produces a positive relationship with equity issuance.

Inter-sectoral differences in the industry produce firm characteristics that vary, such as growth opportunities, size, and age (Das and Roy, 2007; Daskalakis and Psillaki, 2008). Thus, asymmetric information can lead to inter-sectoral differences in capital structure decisions. For instance, manufacturing firms, which have a larger proportion of tangible assets, may experience smaller asymmetric information problems than non-manufacturing firms. Firms with high-quality intrinsic value may avoid issuing securities because they are perceived as underpriced by the market. However, the asymmetric information problem can lead to adverse selection, where firms with low intrinsic value sell more securities. Older firms, which have more stable profitability than younger firms, can allocate resources to increase the disclosure of information, thereby reducing asymmetric information problems. Therefore, intra-firm characteristics play a crucial role in determining the level of asymmetric information and the subsequent capital structure decisions, with firms more likely to issue debt when equity issues experience mispricing

H2: there are differences in effect firm size, growth opportunities, and firm age to the debt-equity ratio between manufacturers and non-manufacturers.

3 Research Method

The research data was obtained from firms' annual reports on the Indonesia Stock Exchange from 2008 to 2019. The Jakarta and Surabaya Stock Exchanges transitioned to the Indonesia Stock Exchange (IDX) in November 2007, so our data starts in 2008 and ends in 2019 to avoid bias in investment in new projects during the COVID-19 pandemic. Asymmetric information produces an adverse selection problem if firm securities are issued for new investment (Cariola, et al., 2011), the result is that debt over equity is preferred in new financing (Myers and Majluf, 1984), and sector differences also produce factors that affect the financing (Das and Roy, 2007). Since the firm size is asymmetric information, firms tend to issue debt rather than equity funding issues. On the other hand, firms tend to issue equity compared to debt without asymmetric information. We excluded them from the sample because of the difference in banking and financial sector regulations with others. We tested the first hypothesis using a t-test in independent tests (manufacturing and non-manufacturing). Second, we used analysis of variance with the debt-equity ratio as dependent and explanatory variables, namely growth opportunities, firm size, and firm age. To eliminate outliers, trim the data from extreme values in upper and lower at 20% (Müller, 2011). Our model specification, as given by:

$$DER = \alpha_1 + \beta_2 G + \beta_3 Size + \beta_4 Age + \beta_5 G * Sector + \beta_6 Size * Sector + \beta_7 Age * Sector + \gamma \quad (1)$$

The debt-to-equity ratio (DER) is used as a proxy for the choice between debt and equity issue when financing new investments, as suggested by (Yulianto, et al., 2021). Asymmetric information, which leads to adverse selection, makes firms prefer debt issues over equity. The variables used in the study by (Dang, et al., 2018) to explain capital structure decisions include sales growth (G), which is measured as the growth in sales from the previous year (sales t – sales previous year) divided by sales from the previous year, and size, which is represented by total assets. Age, measured as the time elapsed since the firm was

listed on the Indonesia stock exchange, is also considered (Moon and Yan, 2012). Finally, the sector is represented as a dummy variable, taking the value of 0 for non-manufacturing and 1 for manufacturing (Das and Roy, 2007), as suggested by (Gujarati and Porter, 2009).

4 Result and Findings

4.1 Results

Table 1, Panel A shows that manufacturing firms are older than non-manufacturing firms. Younger firms face an asymmetric information problem related to future investments, which is greater than that of older firms (Baxamusa, et al., 2015; Fama and French, 2002). This model predicts that non-manufacturing firms have a greater asymmetric information problem regarding investment risk uncertainty between internal and external investors. Panel B explains that the data distribution of non-manufacturing firms is more likely to be homogeneous (with kurtosis close to 0). Although the median age is higher than the mean age, on average, non-manufacturing firms are found to be younger than manufacturing firms.

The younger age of non-manufacturing firms compared to manufacturing firms leads to an asymmetric information problem. As a result, when faced with a financing decision, non-manufacturing firms prefer to issue equity rather than debt. It has been found that firms with a focus on maturity, efficiency, equipment replacement, and cost containment tend to have fewer total assets (Dickinson, 2011). As a result, non-manufacturing firms need to consider the equilibrium between working capital and capital structure to maintain their maturity (Garg, 1997). Before explaining the determinants of why younger firms have greater asymmetric information than older firms, a correlation test was conducted to determine the relationship.

Before conducting a causal analysis, the correlational study in Table 2 provides evidence that firm size has a stronger contribution to the debt-equity ratio compared to other factors. In contrast, older firms and firms with higher sales growth have a larger asymmetric information problem, leading them to prefer issuing equity over debt. On the other hand, firm size positively correlates with the debt-equity ratio.

Table 3 provides evidence that firm size determines the debt-equity ratio (DER) in all firms and non-manufacturing firms. However, this relationship is not significant in the manufacturing sector. Based on the data distribution, the majority of the sample data in the analysis (85.79%) belongs to non-manufacturing firms. Therefore, the regression results do not significantly differ between all firms and non-manufacturing firms.

4.2 Findings

Our findings suggest that firm-size is more likely to have an asymmetric information problem compared to sales growth and firm age (Baxamusa, et al., 2015). Brito and John (2002) link future investment with asymmetric information. When a younger firm is faced with future investment uncertainty, it faces risks from liquidity growth opportunities. We predict that asymmetric information in firm size determines capital structure decisions (Myers and Majluf, 1984). In contrast to manufacturing firms, since non-manufacturing firms have larger intangible assets as producers of asymmetric information, they prefer debt issues over equity issues. Saleh (2018) research describes 143 manufacturing firms listed on the Indonesia stock exchange during the 2012 – 2016 period as having greater tangible assets than intangible assets. Starting from the paper by Akerlof (1970) regarding in the used car market, buyers cannot observe the quality of the car, and as a result, they are willing to pay a premium for a low-quality car (a lemon) and vice versa. Consequently, sellers of lemons are winners, sellers of high-quality cars (plums) are losers, and buyers are indifferent.

Similarly, since non-manufacturing firms tend to choose debt over equity, they are predicted to have an asymmetric information problem because of their larger size compared to manufacturing firms. Outside investors may have difficulty assessing the actual value of total assets in manufacturing firms, as most of their assets are intangible. This hypothesis is relevant to Ang and Jung, (1993); Myers and Majluf, (1984); and Shyam-Sunder and Myers (1999) show that when the intrinsic value of securities cannot be known with certainty, securities issued by firms with high intrinsic value are undervalued, while those

issued by firms with low intrinsic value are overvalued. Moreover, asymmetric information can lead to firms with low intrinsic value mimicking the issuance of securities with high intrinsic value. Therefore, firms tend to prefer internal financing first, then debt, and finally equity issues. We will explain the financing hierarchy based on the asymmetric information problem related to firm size or intrinsic value.

Table 1. Descriptive Statistics
(*Source:* Annual report from IDX from 2008 – 2019, analyzed.)

-	Count	mean	median	Std Dev	Kurtosis	Skewness	Q1	median	Q3	Mean Diff
Panel A										
Sales Growth	3063	1.553	0.084	32,692	960.558	30,381	-0.037	0.084	0.226	-0.715
Size	3063	28,521	28,499	1,708	0.351	0.006	27.371	28,499	29,661	-0.135
age	3063	2,739	2,944	0.675	0.658	-1.029	2,303	2,944	3.258	0.245*
DER	3063	1.133	0.883	0.882	1,880	1.413	0.470	0.883	1.535	-0.020
Panel B-										
Non Manufacturing										
Sales Growth	2628	1,655	0.086	34,851	864,931	29,022	-0.036	0.086	0.236	-
Size	2628	28,540	28,532	1,704	0.157	-0.065	27,389	28,532	29,703	-
age	2628	2,704	2,890	0.674	0.547	-0.950	2.197	2,890	3.258	-
DER	2628	1.136	0.886	0.879	1,814	1.397	0.473	0.886	1.539	-
Manufacturing										
Sales Growth	435	0.940	0.074	13.717	418,632	20,295	-0.039	0.074	0.170	-
Size	435	28,405	28,408	1,730	1.618	0.421	27.168	28,408	29,370	-
age	435	2,949	3.219	0.644	2,508	-1,715	2,639	3.219	3,401	-
DER	435	1.116	0.857	0.902	2.289	1,508	0.446	0.857	1.518	-

Mean difference = variable mean difference between manufacturing with non-manufacturing firm; * = sig 5%

Table 2. Correlation Matrix
(*Source:* Annual report from IDX from 2008 – 2019, analyzed.)

	Sales Growth	Size	age	DER
Sales Growth	1	-	-	-
Size	0.026	1	-	-
age	0.007	0.049	1	-
DER	-0.002	0.090	-0.006	1

Table 3. Regression Results
(*Source:* Annual report from IDX from 2008 – 2019, analyzed.)

Manufacturing	All Firm	Manufacturer	Non Manufacturer
N Observation	3063	435	2628
Intercept	-0.182	-0.149	-0.188
Sales Growth	-0.000	-0.001	-0.000
Size	0.047*	0.043	0.048*
Age	-0.016	0.006	-0.016
Growth*sector	-0.001	-	-

Manufacturing	All Firm	Manufacturer	Non Manufacturer
Size*sector	-0.003	-	-
Age*Sector	0.023	-	-
R Square	0.00538	0.007	0.00863
F Test	4.382	1.090	7,614
p-value	0.000*	0.352	0.000*

We have found that manufacturing firms are generally older than non-manufacturing firms, and there is no difference in firm size and growth opportunities between the two. In fact, the age and growth opportunities of the firm are not the cause of asymmetric information, but rather are more caused by firm age. We do not support the perspective of the firm life-cycle theory, which has suggested that age differences are the producer of asymmetric information (Bulan and Yan, 2012; Das and Roy, 2007). Older firms have more incentives to maintain their reputation and result in less asymmetric information compared to younger firms. The presence of regulations in the capital market regarding disclosure of information has effectively prevented asymmetric information between older and younger firms. However, no differences in growth opportunities were found between manufacturing and non-manufacturing firms, so no asymmetric information was found, which is different from the paper by Lang, et al. (1996). Therefore, the absence of asymmetric information within the industry sector has no effect on capital structure decision.

Interesting fact, when there is no difference in size between manufacturing and non-manufacturing firms, it has less influence (with an R-squared close to 0) on capital structure decisions. Inline with (Myers and Majluf, 1984), Firm size has asymmetric information content. Cross-sectional analysis conducted by Rajan and Zingales (1994) cannot reject the pecking order theory (POT). Under this theory, firms with fewer tangible assets have greater asymmetric information and therefore use more debt. They found that firm size is positively related to leverage (book and market value). When firms are larger, they tend to use more leverage than equity, supporting the POT in a different form from the POT hypothesis. In contrast, we have found that firms with larger size produce asymmetric information and have a greater impact on capital structure decisions, resulting in a greater increase in debt to equity ratio (DER). Clearly, regulation in the capital market is ineffective in reducing asymmetric information in all firms, including non-manufacturing firms, resulting in an impact on capital structure decisions. Non-manufacturing firms are more difficult to appraise, especially their fixed assets, compared to manufacturing firms (Akeem, et al., 2014). This creates more asymmetric information for non-manufacturing firms. As a result, the size of manufacturing firms has a greater impact on capital structure decisions. The larger the size of non-manufacturing firms, the more difficult it is to observe and appraise their total assets.

5 Conclusion

We investigated that manufacturing firms are more older compared to younger firms. According to a paper by Pervan, et al. (2019), manufacturing firms tend to be older due to their ability to generate more profitability compared to younger non-manufacturing firms. Since they have more profitability, they have more incentives to disclose information to the market. However, there was no difference found for firm size and age.

Our investigation has found that firm size produces greater asymmetric information in non-manufacturing firms since they have more tangible assets than manufacturing firms. In contrast to intangible assets, which are difficult to observe, outside investors cannot distinguish between low-quality and high-quality intrinsic value in non-manufacturing firms. The presence of asymmetric information has produced intangible assets that do not match the actual intrinsic value, resulting in the mispricing of issued equity. Since non-manufacturing firms are more likely to have high intrinsic value, equity is considered overpriced, and the cost of investment becomes smaller, increasing the difference in return from the cost of investment compared

to the full information condition. Different, since the firm with a lower intrinsic value is more likely to fail.

When manufacturing firms are older and more profitable, they are more likely to use retained earnings compared to external financing. Regulations on the disclosure of information from the Financial Services Authority may have been able to expose more actual tangible assets in manufacturing firms. However, there is still an adverse selection problem in non-manufacturing firms with a higher proportion of intangible assets than manufacturing firms. Our paper only investigates the impact of asymmetric information on the adverse selection problem. Further research could explore the moral hazard problem as a determinant of asymmetric information. A comprehensive analysis could be conducted to test the determinants and impacts of asymmetric information.

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