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Income Diversification and Capital Structure: International Banks Evidence

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Abstract:

This study aims to contribute to the literature on a corporate capital structure by analyzing the effect of income diversification on the capital structure of international banking companies. This study uses panel data from 32 global banking companies in 2010-2019 with 320 firm-year observation obtained from stock exchanges in each country. The generalized method of moments is used as a statistical analysis tool for panel data. The results show that the income diversification carried out by international banking companies has a positive effect with high significance on the company's short-term debt structure. Therefore, income diversification can be a factor affecting the capital structure of international banking companies. Previous studies examined determinants of capital structure such as profitability, tangibility, firm size, firm growth, firm age, and non-debt tax shield. The findings of this study add the income diversification variable to the determinants of capital structure. This study is expected to bring benefits to banking management, investors, and regulators in the banking sector, as well as to make new contributions to the literature on corporate capital structure.

Keywords: Capital structure, Income diversification, endogeneity, Generalized method of moments

1. Introduction

The financial design of a company should be able to provide a special character for each company. This starts from how a company builds its financial strength through ideal and optimal financial construction, as reflected in its capital structure, to the minimum cost of capital and ultimately providing maximum value for the company (Sheikh & Qureshi, 2017).

The capital structure decision came to the main area of research in corporate finance, triggered by seminal work of Modigliani and Miller (1958), who stated that, in a perfect market, there is no influence of capital structure on firm value (irrelevance). A bunch of theories about capital structure emerged as a response to the opinions put forward by (Modigliani & Miller, 1958, 1963), such as *the trade-off theory*(Kraus & Litzenberger, 1973), *the pecking order theory*(Myers & Majluf, 1984), *agency cost theory*(Jensen & Meckling, 1976), *market timing theory*(Baker & Wurgler, 2002). In addition, until now, various empirical studies have been conducted to examine the factors that influence the company's capital structure, both in financial and non-financial sector companies.

However, in general, testing is mostly carried out on companies in the non-financial sector. This is because the capital structure of financial sector companies, such as banking, is more dominated by debt and differences in the characteristics of the banking business, which naturally require debt as a 'raw material' in its business so that banking companies act as a party providing and requiring capital. This characteristic is the main differentiator between non-financial companies and banking companies. Furthermore, there are regulatory limits from the government regarding the minimum limit of banking equity (capital adequacy ratio), banking product variants, funding decisions for debtors, etc. (Guizani, 2020; Khan, Bashir, & Islam, 2020; Sheikh & Qureshi, 2017; Titman & Wessels, 1988).

Previous studies found empirical evidence showing that profitability, company growth, and company risk are the most relevant factors affecting the capital structure of banking companies (Al-Hunnayan, 2020; Ghosh & Chatterjee, 2018; Guizani & Ajmi, 2021; Khan et al., 2020; Sheikh & Qureshi, 2017). However, they found that profitability had a negative effect on capital structure and argued that the higher the profitability of a banking company, the lower the need for banks to be for debt or placement of third-party funds. This is in line with Myers and Majluf (1984) in the pecking order theory, stating that companies prefer funding from internal companies.

On the other hand, a study by Etudaiye-Muhtar and Abdul-Baki (2020) on banking companies in 24 developing countries found that banking profitability had a positive effect on capital structure. These findings indicate that as the ability of banking companies to earn profits increases, the higher the need for third-party fund placements in these companies. This is in line with Kraus and Litzenberger (1973) in the trade-off theory stating that companies need debt to improve their company performance as long as the company is able to minimize the risks arising from the use of the debt. Bukair (2019) conducted a study on the capital structure of Islamic-based banking companies (sharia) in the countries of the Gulf Cooperation Councils in the period of 2009-2011 found that profitability did not have a significant effect on their capital structure. This shows that there are differences in the characteristics of commercial banking from sharia banking. Based on the results of empirical research in the past, testing was carried out to test capital structure theories in terms of searching for the optimal capital structure. Various variables that have been synthesized from capital structure theories are tested for their influence on capital structure. Kahya, Ersen, Ekinci, Tas, and Simsek (2020)examined the effect of moral hazard on the company's capital structure. Feng, Hassan, and Elamer (2020)tested the effect of the number of directors on the company on the company's capital structure and did not find a significant effect on both. Vintilă and Gherghina (2014) measured the effect of capital structure on firm value, and the result showed that capital structure had a positive and significant effect on firm value. Reflecting on the efforts of previous researchers in finding the factors that can influence the company's capital structure, this study attempts to measure the effect of income diversification on the capital structure of banking companies.

It is known that the primary income of banking companies is interest income. However, given the broader needs of the community, banking companies are trying to win the tighter competition among financial service actors by providing services such as transaction commissions, insufficient funds fees (NSF), service charges, credit card annual charges, over-limit charges, foreclosure charges, etc. (Adesina, 2019). These revenues become a component of non-interest income. However, previous studies found that income diversification can reduce company performance because (1) the costs incurred by this diversification are not proportional to the income, and (2) there is a breakdown of the managerial focus in managing income diversification (Luu, Nguyen, Vu, & Tuan, 2019).

Researchers have contradicting opinions on the effect of income diversification; Githaiga and Yegon (2019) found that income diversification can weaken the ability of human capital to improve banking performance in East Africa. Adesina (2019)tested income diversification on the efficiency of banking companies and found that income diversification in banking companies on the African continent significantly decreased company efficiency. However, Luu et al. (2019); Sharma and Anand (2018) showed that income diversification can significantly improve the company's financial performance and is able to reduce risk in banking companies.

Apart from the contradiction regarding the role of income diversification in increasing or decreasing company performance, the study of income diversification is quite interesting when it is related to the capital structure of banking companies. Furthermore, when viewed from the condition of established banking companies, are these banking companies able to take advantage of income diversification to achieve the effectiveness of their capital structure? To the best of the researcher's knowledge, there are a few studies that examine the relationship of diversification of bank income to its capital structure; therefore, this study poses the following research questions:

• RQ: Does the diversification of income carried out by established banking companies affect their capital structure?

This study was conducted using a dataset of the 32 largest banking companies globally from 2010 through 2019. Measurements were made on the variables used in this study. The capital structure with all indicators including long term debt to total assets (LTD), short term debt to total assets (STD), and total debt to total assets (TD) (Al-Ajmi, Abo Hussain, & Al-Saleh, 2009; Alipour, Mohammadi, & Derakhshan, 2015; Bolarinwa & Adegboye, 2020; Feng et al., 2020) are the dependent variables. Meanwhile, income diversification, which is non-interest income, and its ratio which is calculated using the AHHI model (adjusted Herfindahl-Hirschman index) (Adesina, 2019; Githaiga & Yegon, 2019; Luu et al., 2019;Sharma & Anand, 2018; Vidyarthi, 2019) are independent variables.

This study aims to examine the role of income diversification on the capital structure of a banking company that has been established and is one of the largest banks in the world. The findings of this study are expected to contribute to the body of knowledge in the field of banking capital structure, its implications for investors, banking management, and policymakers in the banking sector.

2. Theoretical Review

2.1. Development of Capital Structure Theory

Capital structure has become the most developing issue in the financial management environment. A proposition put forward by Modigliani and Miller (1958) stated that, in a perfect market (symmetric information, no taxes, transaction costs, bankruptcy costs, and no agency costs), the company's performance is not affected by the capital structure; in other words, there is no ideal capital structure. However, Modigliani and Miller (1963) proposed that if there is a tax, the problem of capital structure will be different because the loan interest is a tax deduction factor so as to create a tax hedge value. The responses that arose due to the propositions put forward by Modigliani and Miller (1958, 1963) opened up

more and more space to find the optimal capital structure. Kraus and Litzenberger (1973), in the trade-off theory, proposed a balance between the benefits and risks of using debt which would provide the company with an optimal capital structure. In other words, the company can increase the portion of its debt to the limit of its tax benefits.

Pecking order theory reveals that due to asymmetric information, companies prefer to use internal equity compared to external equity; this is based on the costs that may arise due to asymmetric information conditions (Myers & Majluf, 1984). Furthermore, Jensen and Meckling (1976) put the concept of agency cost, which suggests the effect of conflicts arising between managerial parties and shareholders and creditors in terms of financing decisions. Then, Baker and Wurgler (2002) put forward a market timing theory, suggesting companies determine the right time when they want to issue shares, i.e. when equity is considered overvalued by the market, and repurchase when equity is considered undervalued by the market.

Various studies have been carried out to test these theories and opened up opportunities for further development of capital structure theory. Ross (1977)proposed a signaling theory which states that when a company submits a debt request, it is a signal that the company does not issue shares. Titman (1984), in stakeholder theory, suggests that the decision on the company's capital structure will consider the preferences of the stakeholders in the company. Suppose trade-off theory talks about the position of using debt to the limit of its benefits, the development of this theory looks at its dynamic side (dynamic trade-off theory), which suggests that companies make periodic adjustments in achieving their planned debt use targets (Fischer, Heinkel, & Zechner, 1989).

Morellec and Schürhoff (2011)stated that when a company decides to invest, it is a signal of the need for internal equity compared to debt. Meanwhile, Cronqvist, Makhija, and Yonker (2012) stated that the behavior of top executives at companies has an impact on company capital decisions; this study is known as the behavioral consistency theory. Lam, Zhang, and Lee (2013)proposed that the interaction between company managerial and the environment and subordinates can influence the company's capital structure decisions. Chu and Wang (2017)proposed a bargaining theory that shows that when a company improves its debt structure, suppliers will also improve its debt structure to maintain the level of negotiation with customer companies.

2.2. Determinants of Capital Structure

Testing of the developing capital structure theory has raised the factors that characterize each theory, namely:

2.2.1. Profitability

Profitability is the company's ability to generate profits. However, the effect of profitability on the company's capital structure can vary according to the capital structure theories reviewed. For example, from the trade-off theory point of view, the company's profitability has a positive effect on the company's debt structure due to increased tax benefits. In other words, the more increasing the company's profitability, the more likely the company is in debt (El-Sayed Ebaid, 2009; Etudaiye-Muhtar & Abdul-Baki, 2020; Kraus & Litzenberger, 1973;Rani, Yadav, & Tripathy, 2019).

From a different point of view, proponents of pecking order theory state that when a company makes a profit, the company tends to reduce its debt portion and prefers to use the company's available internal funds, such as retained earnings (Al-Hunnayan, 2020; Ghosh & Chatterjee, 2018; Guizani & Ajmi, 2021; Khan et al., 2020; Myers & Majluf, 1984; Titman & Wessels, 1988). Given that the characteristics of banking sector companies simultaneously provide capital and require capital, banking companies naturally need debt as the main component in their operations. However, in international banking, the increase in the debt structure will cause asymmetric information between the parent company and its subsidiaries, so that this will result in higher agency costs. Therefore, the hypotheses in this study can be formulated as follows:

- H1.The higher the level of profitability of a banking company, the lower the tendency for banking companies to use debt.
- H1a.There is a negative and significant effect of profitability on short-term debt (STD)
- H1b.There is a negative and significant effect of profitability on long-term debt (LTD)
- H1c.There is a negative and significant effect of profitability on total debt (TD)

2.2.2. Firm Size

The larger the size of the company, the higher the confidence of creditors (debt holders) in providing loans to the company; thus, large companies tend to have higher debt (Al-Hunnayan, 2020; Al-Ajmi et al., 2009; Czerwonka & Jaworski, 2021; Dawar & M. Hull, 2014; Feng et al., 2020; Guizani & Ajmi, 2021; Kraus & Litzenberger, 1973; Muhammad, Ei Yet, Tahir, & Nasir, 2020; Yu & Yu, 2012). However, according to the pecking order theory, information asymmetry is more likely to occur in large companies. Large companies tend to have more access to equity markets than smaller companies. Therefore, there is a possibility that the larger the company, the smaller the use of its debt (Alipour et al., 2015; Bolarinwa & Adegboye, 2020; Haron, 2016; Myers & Majluf, 1984; Rani et al., 2019). In a banking company, the larger the size of the company, the higher the agency cost that may arise (Jensen & Meckling, 1976). The hypotheses in this study can be formulated as follows:

- H2.The larger the firm size, the more likely the banking company is to reduce its debt portion.
- H2a.There is a negative and significant effect of firm size on short-term debt (STD)
- H2b.There is a negative and significant effect of firm size on long-term debt (LTD)
- H2c.There is a negative and significant effect of Firm Size on total debt (TD)

2.2.3. Non-debt tax shield (NDTS)

Tax benefits can be obtained from the use of debt. Interest arising from debt is a tax deduction factor. However, tax benefits can also be obtained from non-debt factors, i.e., through depreciation as a tax deduction. If the higher tax benefits are obtained from the non-debt side, the company will reduce the proportion of its debt to avoid greater capital costs (Alipour et al., 2015; Czerwonka&Jaworski, 2021; Rani et al., 2019). Meanwhile, (Bukair, 2019; Haron, 2016) found that there was no significant effect of tax benefits on the company's debt structure. The non-debt tax shield can be measured as the amount of depreciation against its total assets. Therefore, the hypotheses in this study can be formulated as follows:

- H3. The higher the tax benefits obtained from non-debt, the lower the debt structure of the banking company
- H3a.There is a negative and significant effect of NDTS on short-term debt (STD)
- H3b.There is a negative and significant effect of NDTS on long-term debt (LTD)
- H3c.There is a negative and significant effect of NDTS on total debt (TD)

2.2.4. Growth Opportunities

Companies with high growth tend to use less debt. This is due to the increased volatility of cash flows so that companies try to avoid loan interest. On the other hand, if the company's growth increases, it will have implications for the company's value which tends to be overvalued. Therefore, it is in accordance with the market timing theory stating that when companies experience overvaluation, they tend to use external equity when they need funds. When it is viewed from this point of view, there is a negative relationship between growth and the company's debt structure (Alipour et al., 2015; Bajaj, Kashiramka, & Singh, 2020; Baker & Wurgler, 2002; Eriotis, Artikis, Vasiliou, & Ventoura-Neokosmidi, 2007; Sheikh & Qureshi, 2017). However, for companies in the banking sector, company growth is considered a good signal and increases the level of confidence of debtors in placing their funds in the bank. In this case, the company growth is the percentage change in income. Therefore, the hypotheses in this study can be formulated as follows:

- H4.The higher the growth opportunities, the higher the debt structure of banking companies
- H4a.There is a positive and significant influence of growth on short-term debt (STD)
- H4b.There is a positive and significant influence of growth on long-term debt (LTD)
- H4c.There is a positive and significant effect of growth on total debt (TD)

2.2.5. Tangibility

Companies that have tangible assets can be interpreted as having a collateral value of assets (CVA). From the creditor's perspective, the company's tangible assets will be more valuable when the company is liquidated. Therefore, ownership of tangible assets in the company will make it easier for the company to obtain loans from third (Dawar & M. Hull, 2014; Farhangdoust, Salehi, & Molavi, 2020; Guizani & Ajmi, 2021; Muhammad et al., 2020; Yu & Yu, 2012). However, from another point of view, a high level of debt can indicate the company's overinvestment in its tangible assets, which will trigger agency costs between shareholders and debtholders(Jensen & Meckling, 1976). Thus, the company's tangiblity can have a negative effect on its debt structure. Tangibility can be measured by calculating the ratio of the company's tangible assets to its total assets (Ghosh, 2018; Rani et al., 2019). However, for companies engaged in banking, increased tangibility will increase the trust of debtors, so that increased tangibility tends to increase the structure of bank debt. Therefore, the hypotheses in this study can be formulated as follows:

- H5.Increasing tangibility to banks will improve their debt structure.
- H5a.There is a positive and significant influence of tangibility on short-term debt (STD)
- H5b.There is a positive and significant influence of tangibility on long-term debt (LTD)
- H5c.There is a positive and significant influence of tangibility on total debt (TD)

2.3. Income Diversification

The primary income of a banking company is income derived from interest. However, in line with the development of economic activity in the last few decades, banking companies have provided other services to economic players. Diversification by banking companies includes security underwriting, insurance, brokerage, and other financial services (Sawada, 2013). This additional service is also one of the strategies of the banking sector to obtain a larger and wider customer base, and this is a competitive advantage that each bank has in fulfilling customer needs for financial services.

In contrast to other sectors, the banking sector has a higher tendency for long-term relationships with debtors, which makes debtors and creditors recognize each other well. Creditors clearly know the needs of their debtors, while debtors recognize the characteristics of their creditors. This relationship provides space for both parties to further collaborate (Elsas, Hackethal, & Holzhäuser, 2010; Nguyen, 2018). Danso, M. Hull, and Adomako (2014) revealed that income diversification carried out by banks can reduce the risk of bankruptcy on the grounds that different but integrated business activities provide different levels of risk. Thus, this can increase banking stability by improving the performance of banking companies (Abuzayed, Al-Fayoumi, & Molyneux, 2018; Harimaya & Ozaki, 2021).

However, there are conflicting opinions about the implications of this income diversification. Several researchers have found that the diversification of banking companies has actually decreased the company's performance. Yang, Liu, and Yeutien Chou (2020), in their research on commercial banks in the United States, showed that income verification increases systematic risk in banking companies. Meanwhile, Zouaoui and Zoghlami (2020) found that the income diversification carried out by banks in the MENA country did not affect their market strength. Another interesting finding

by Paltrinieri, Dreassi, Rossi, and Khan (2020) showed that non-interest income as a proxy for income diversification in conventional and sharia banking companies was able to increase banking profitability but did not show a significant effect on bank stability.

The inconsistency of the findings regarding the effect of income diversification on banking firms is a matter of debate for researchers. Some researchers who oppose income diversification in banking companies argue that the costs arising from breaking the income focus are not proportional to the benefits derived from this diversification (Chen, Liang, & Yu, 2018; Hou, Li, Li, & Wang, 2018; Jadiyappa, Hickman, Jyothi, Vunyale, & Sireesha, 2020; Jouida & Hellara, 2018; Nguyen, 2018; Toh, 2019). Meanwhile, other researchers argue that revenue verification in banking companies can reduce the risk of financial distress and improve company performance through achieving a competitive advantage that is needed in today's competitive world (Doan, Lin, & Doong, 2018; Githaiga & Yegon, 2019; Luu et al., 2019; Meslier, Tacneng, & Tarazi, 2014; Sharma & Anand, 2018; Sissy, Amidu, & Abor, 2017).

However, in the international category of banking companies, in other words, established banking companies should have effective and efficient resources so that costs and risks that may arise due to income diversification activities can be minimized as an effect of the effectiveness of the banking system, which has been built. Therefore, the hypotheses in this study can be formulated as follows:

- H6.In established (international) banking companies, the diversification of income will further enhance the company's debt structure.
- H6a.There is a positive and significant influence of income diversification (IDIV) on short-term debt (STD)
- H6b.There is a positive and significant influence of income diversification (IDIV) on long-term debt (LTD)
- H6c.There is a positive and significant influence of income diversification (IDIV) on total debt (TD)

3. Method

3.1. Research Samples and Data

This study uses the population of the largest banking companies in the world as measured by their company assets. The choice of the banking sector is based on the unique character of the banking business, which initially required debt as a business commodity. Banks that have been active in the international world should have had effectiveness and efficiency in their banking system so that the income diversification effect should have an influence on their capital structure decisions. Of the 50 banking companies indexed by Forbes in 2019, the sampling criteria were carried out by purposive sampling, obtained 32 banking companies that met the criteria to be used as research samples. The criteria for selecting the research sample included (1) the company has a complete published financial report from 2010 to 2019, (2) the company does not have negative profits, and (3) the company has income diversification. The type of data used is secondary data, while the unit of analysis is the company's financial statements from 2010 to 2019, obtained from the websites of each bank. These financial reports have been published on the stock exchanges of each country. Therefore, this study uses panel data with 320 years of observation.

3.2. Operational Definition and Measurement of the Variable

The operational definition of variables is explained based on relevant concepts and theories, with the aim of not causing different perceptions. The variables referred to in this study are capital structure proxied by short-term debt, long-term debt, and total debt (Alipour et al., 2015; Bolarinwa & Adegboye, 2020; Feng et al., 2020; Guizani & Ajmi, 2021; Tse & Rodgers, 2014). Factors commonly used in testing capital structure theories such as profitability, firm growth, firm size, tangibility, non-debt tax shield (NTDS) were used in this study (Ajay & Madhumathi, 2015; Al-Ajmi et al., 2009; Bajaj et al., 2020; Bukair, 2019; Elvin & Hamid, 2016; Fekadu, 2020; Ghosh, 2018; Haron, 2016; Rani et al., 2019; Sheikh & Qureshi, 2017; Toumi, 2019). Table 1 shows the measurements of the research variables used in this study.

While the income diversification variable was measured using the Herfindahl-Hirschman Index (HHI) index. HHI can also be referred to as the concentration level of income so that to get a diversification effect, one is deducted from HHI (Elsas et al., 2010; Jadiyappa et al., 2020; Nguyen, 2018; Vidyarthi, 2019; Zouaoui & Zoghlami, 2020). It is generally known that the primary income of banking companies is interest income. However, various studies have been conducted to analyze the effect of diversification on company performance, as described above. Therefore, income diversification (IDIV) in banking consists of the interest income (INC), non-interest income (NIC), and total income (TI) can be measured as follows:

$$HHI_{income} = IDIV = 1 - \left[\left(\frac{INC}{TI} \right)^2 + \left(\frac{NIC}{TI} \right)^2 \right]$$

(1)

The HHI_{income} index value (IDIV) will range from 0 to 0.5. If there is no diversification, the IDIV will be zero; whereas if there is full diversification (income diversification = non-interest income), the IDIV value is equal to 0.5 (Elsas et al., 2010). The expectation of the influence of the independent variables (income diversification, profitability, growth opportunity, tangibility, firm size, and non-debt tax shield) on the dependent variable (leverage) in this study leads to the concepts and theories of capital structure that are commonly used, such as trade-off theory, pecking order theory, and market timing theory.

| Variable | Measurement | References | Expectation (Banking Sector) |
|-------------|--|--|--|
| Dependent | | | |
| STD | Short-term debt/total assets | Alipour et al. (2015); Feng et al. (2020) | |
| LTD | Long-term debt/total assets | Alipour et al. (2015); Feng et al. (2020) | |
| TD | Total debt/total assets | Alipour et al. (2015); Feng et al. (2020) | |
| Independent | | | |
| IDIV | Income diversification (HHI _{income}) | Elsas et al. (2010); Nguyen (2018); Vidyarthi (2019) | Positive (+) Trade-off theory |
| PROF | Net income/total assets | Bajaj et al. (2020); Ghosh (2018) | Negative (-) Pecking order theory |
| GROW | (Salest-salest-1)/salest-1 | Bajaj et al. (2020); Ghosh (2018) | Positive (+) Trade-off theory, Market timing theory |
| TANG | Fixed assets/total assets | Bajaj et al. (2020); Ghosh (2018) | Positive (+) Trade-off theory |
| SIZE | Ln(total assets) | Bajaj et al. (2020); Ghosh (2018) | Negative (-) Pecking order theory, Agency Theory |
| NDTS | (Depreciation+amortization)/t otal assets | Bajaj et al. (2020); Ghosh (2018) | Negative (-) Trade-off theory |

Table 1: Operational Definition of Variable

3.3. Research Method

Three empirical research models were proposed in which all the independent variables were tested on their respective dependent variables. Model testing was performed using multiple linear regression analysis for panel data types. The test was conducted to see the effect of income diversification (IDIV), profitability (PROF), firm growth (GROW), tangibility (TANG), firm size (SIZE), and non-debt tax shield (NDTS) on each short-term debt (STD), long-term debt (LTD), and total debt (TD). Thus, the model can be written in the following equation:

 $LEVERAGE(STD, LTD, TD)_{it} = \alpha_i + \beta_1(IDIV_{it}) + \beta_2(PROF_{it}) + \beta_3(GROW_{it}) + \beta_4(TANG_{it})$

 $+\beta_5(SIZE_{it}) + \beta_6(NDTS_{it}) + \varepsilon_{it}$ (2) Processing data is panel data, so the cross-section unit is symbolized by 'i' or corporate entity, while 't' is the period of observation, α_i is the regression constant, $\beta_{1,2,3,4,5,6}$ is the regression coefficient, while ε is the error term.

4. Result

4.1. Descriptive Statistics

The results of descriptive statistical processing can be seen in Table 2. The mean and median values of short-term debt (STD) were 83.45 percent and 85.59 percent, respectively. The mean and median values of long-term debt (LTD) were 9.87 percent and 8.57 percent, respectively. Meanwhile, the mean and median values of total debt (TD) were 93.33 percent and 93.75 percent, respectively. This shows that in international banking, short-term debt or placement of third-party funds plays an important role in its capital structure. Another interesting thing is that the maximum value of income diversification (IDIV) in international banking was 49.99 percent, indicating that the non-interest income at the bank was almost the same as its interest income (0.5 means that it is perfectly diversified, where interest income = non-interest income). The average and median values of IDIV were 41.9 percent and 44.09 percent, respectively, indicating that international banks have implemented income diversification at a rate almost equal to their main income, i.e., interest income.

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| Variable | Observation | Mean | Median | SD | Min | Max |
|--------------------|-------------|---------|---------|--------|---------|---------|
| TD_{it} | 320 | 0.9333 | 0.9375 | 0.0208 | 0.8158 | 0.9747 |
| LTD _{it} | 320 | 0.0987 | 0.0857 | 0.0769 | 0.0016 | 0.3492 |
| STD _{it} | 320 | 0.8345 | 0.8559 | 0.0776 | 0.5791 | 0.9623 |
| IDIV _{it} | 320 | 0.4190 | 0.4409 | 0.0782 | 0.1548 | 0.4999 |
| PROF _{it} | 320 | 0.0065 | 0.0062 | 0.0038 | -0.0036 | 0.0140 |
| GROW _{it} | 320 | 0.0390 | 0.0391 | 0.1142 | -0.4820 | 0.4931 |
| TANG _{it} | 320 | 0.0084 | 0.0056 | 0.0117 | 0.0007 | 0.0856 |
| SIZE _{it} | 320 | 14.1048 | 14.0539 | 0.8049 | 12.5193 | 17.6695 |
| NDTS _{it} | 320 | 0.0010 | 0.0009 | 0.0008 | -0.0009 | 0.0048 |

Table 2: Descriptive Statistics

The profitability of banks as measured by return on assets (ROA) was very small, with a maximum value of only 1.40 percent and an average ROA for international banking of 0.65 percent. Given that the banking capital structure is dominated by debt, ROE is more appropriate as a measure of a bank's profitability. The growth rate of the company (GROW) had an average of 3.90 percent, while the average ownership of fixed assets (TANG) for banks was only 0.84 percent, with a maximum of 8.56 percent. This indicates that banking companies do not invest in tangible assets but intangible assets instead.

4.2. Correlation Matrix

| Variable | TD _{it} | LTD _{it} | STD _{it} | IDIV _{it} | PROF _{it} | GROW _{it} | TANG _{it} | SIZE _{it} | NDTS _{it} |
|--------------------|------------------|-------------------|--------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------------------|---------------------------|
| TD_{it} | 1.0000 | | | | | | | | |
| LTD _{it} | 0.1611 | 1.0000 | | | | | | | |
| STD _{it} | 0.1087 | -0.9612 | 1.0000 | | | | | | |
| IDIV _{it} | 0.1007 | 0.0279 | -0.0021 | 1.0000 | | | | | |
| PROF _{it} | -0.4918 | -0.3315 | 0.1946 | -0.3394 | 1.0000 | | | | |
| GROW _{it} | -0.0353 | -0.2945 | 0.2841 | -0.1439 | 0.3612 | 1.0000 | | | |
| TANG _{it} | -0.4157 | 0.0030 | -0.1129 | 0.0169 | 0.1140 | -0.0525 | 1.0000 | | |
| SIZE _{it} | -0.4105 | -0.3872 | 0.2769 | 0.0914 | 0.1642 | 0.0723 | 0.0873 | 1.0000 | |
| NDTS _{it} | -0.3657 | -0.0475 | -0.0473 | 0.1330 | 0.3242 | 0.0147 | 0.2308 | 0.0439 | 1.0000 |

Table 3: Correlation Matrix

Table 3 shows the correlation matrix, i.e., the functional relationship between variables. In general, the correlation between variables was not significant unless the correlation between STD and LTD had a high negative correlation (-0.9612). However, considering that STD and LTD are each dependent variable and are not tested on the same model, the correlation that occurred can be ignored. Furthermore, there was no correlation above 0.7 between variables. Therefore, there is no multicollinearity problem in the variables being tested.

4.3. Endogeneity

Panel data regression testing requires selecting an appropriate model, either the fixed effect model (FEM) or the random effect model (REM). Therefore, the Hausman specification test (HST) resulted that the fixed effect model is more suitable for use than the random effect model in predicting the results of hypothesis testing. However, some researchers conducted tests using the generalized method of moments (GMM) (Bolarinwa & Adegboye, 2020; Etudaiye-Muhtar & Abdul-Baki, 2020; Haron, 2016; Iqbal, Xu, Fareed, Wan, & Ma, 2020; Rani et al., 2019). This is due to the frequent cases of endogeneity in financial studies. Endogeneity can be interpreted as a condition in which a dependent variable can become an independent variable; for example, in this study, leverage is the dependent variable, and profitability is the independent variable. However, it is possible if leverage is placed as independent and profitability as a dependent. In addition, there is a situation where the dependent variable affects each other with the independent variable in a reciprocal direction (bidirectional). The endogeneity can bias the estimation of the research results. Thus, the GMM method is expected to be able to overcome this endogeneity problem.

In this study, endogeneity problems were tested using the Wald test. The results of the Wald-test between IDIV and LTD, STD, and TD show that each rejected null hypothesis (p-value = 0), indicating there is an endogeneity problem between the dependent variables and IDIV. Therefore, the use of the GMM system was more suitable to be applied in this study. Furthermore, the autoregression test (Arellano & Bond, 1991) was used to test the validation of the use of GMM in this study.

4.4. Hypothesis Testing and Discussion

This study pays special attention to analyzing the dependent variable STD, so that the analysis of significance is primarily for STD. Meanwhile, on the independent variable, the focus of this study is IDIV. This is in accordance with the research objective, i.e., to analyze the effect of IDIV on the structure of bank debt where STD is the largest debt component. Table 4 shows the relationship between income diversification (IDIV) and the debt structure of banking companies as tested using the GMM technique. IDIV was tested against short-term debt (STD), long-term debt (LTD), and total debt (TD). This study found that IDIV had a positive and significant effect on STDs at the 1 percent level of significance. This high level of significance indicates that IDIV carried out in international banking companies had implications for its short-term debt. However, IDIV did not have a significant relationship to LTD and TD.

Profitability (PROF) showed a negative and significant effect on STD and LTD at the 5 percent and 1 percent significance levels but did not show a significant effect on BP. Thus, H1 is generally accepted.

| Variable | STD | LTD | TD | |
|--------------------------------|-------------------|--------------------|--------------------|--|
| LEV(STD,LTD,TD) _{t-1} | 0.190*** (0.0027) | 0.080*** (0.0000) | 0.176*** (0.0000) | |
| IDIV | 0.259*** (0.0000) | -0.014 (0.2624) | 0.002 (0.4712) | |
| PROF | -2.151** (0.0195) | -3.125*** (0.0000) | -0.144 (0.3914) | |
| GROW | 0.049*** (0.0021) | -0.0005 (0.6612) | -0.002*** (0.0036) | |
| TANG | 0.494 (0.4871) | -1.086*** (0.0000) | -0.194*** (0.0001) | |
| SIZE | -0.046** (0.0294) | -0.004 (0.2180) | -0.024*** (0.0000) | |
| NDTS | -13.349 (0.1584) | 19.217*** (0.0000) | -1.565*** (0.0009) | |
| Observations | 256 | 256 | 256 | |
| J-statistic | 21.453 | 28.137 | 29.357 | |
| Prob (J-statistic) | 0.667 | 0.301 | 0.249 | |
| AR(1) test (ρ-value) | 0.000 | 0.209 | 0.623 | |
| AR(2) test (ρ-value) | 0.615 | 0.225 | 0.239 | |

Table 4: Result of Regression Test (Generalized Method of Moments - GMM)

Notes: P-Values Are Shown In Parentheses, While ***, **, * Denote Significance At 1%, 5% And 10% Respectively. Abbreviations, STD (Short-Term Debt), LTD (Long-Term Debt), TD (Total Debt), IDIV (Income Diversification), PROF (Profitability), GROW (Growth), TANG (Tangibility), SIZE (Firm Size), and NDTS (Non-Debt Tax Shield)

In most studies on capital structure in the banking sector, researchers find that the level of profitability has a negative effect on the capital structure (Al-Hunnayan, 2020; Ghosh & Chatterjee, 2018; Guizani & Ajmi, 2021; Kahya et al., 2020; Khan et al., 2020). However, several studies have found that the profitability of banking companies has a positive and significant effect on their debt structure (Etudaiye-Muhtar& Abdul-Baki, 2020). The results of this study indicate that international banks are more careful in maintaining their debt ratios, as debt to banks is a 'commodity' that is used to earn profits. These findings also indicate that international banks follow pecking order theory in their capital structure decisions.

Growth Opportunities (GROW) showed a positive and significant effect at the 1 percent level on STD but did not show a significant effect on LTD. Tests on TD show that GROW had a significant relationship with the opposite direction of influence. In general, when viewed from the effect of GROW on STD, H4 is accepted. These results are in line with research conducted by Al-Hunnayan (2020); Czerwonka and Jaworski (2021); Kahya et al. (2020). However, some researchers have found that GROW can have a negative effect ((Alipour et al., 2015; Chandra et al., 2019; Sheikh & Qureshi, 2017), even Bolarinwa and Adegboye (2020); Dawar and M. Hull (2014) found that GROW had no significance to the debt structure. The results of this test indicate that as the company's revenue grows, the tendency for banks to need third-party funds is getting higher. Growth in a banking company shows the level of trust of the debtor to the bank so that it will linearly increase its debt structure.

The regression results show that TANG had no significant effect on STD, so H5 is rejected. These results are in line with research conducted by Bolarinwa and Adegboye (2020); Bukair (2019); Feng et al. (2020); Ghosh and Chatterjee (2018), showing that the level of ownership of tangible assets in banking companies had no significance in its debt decisions. This is because the debt held by banks is fully used to earn interest income.

Furthermore, the regression results show that firm size (SIZE) had a negative and significant effect on STD and TD but not significant on LTD. This finding supports the hypothesis (H2), stating that SIZE has a negative and significant effect on the structure of bank debt. The greater the size of the company will increase the agency cost due to the asymmetric information that arises. This result contradicts the findings of Al-Hunnayan (2020); Bukair (2019); Etudaiye-Muhtar and Abdul-Baki (2020); Guizani and Ajmi (2021); Kahya et al. (2020); Khan et al. (2020), stating that in Islamic banking in the Middle East and developing countries, SIZE had a positive and significant effect.

In this study, the Non-debt tax shield (NDTS) had no significant effect on STD. This is in line with research conducted by Bukair (2019); Haron (2016); Rani et al. (2019). However, NDTS had a negative and significant effect on LTD and TD, so that H3a is rejected, but H3b and H3c are accepted. NDTS is a measure of the amount of depreciation on the company in terms of being a tax deduction. Given that in banking, the amount of fixed assets is not significant to its total assets, while

the tax deduction obtained from the depreciation effect is not very influential. This is confirmed by the findings of TANG, which were not significant for STD.

The results of regression using the fixed-effect model are shown in Table 5. The models that are built show a high R2, but because endogeneity is indicated, the interpretation is carried out by taking into account the results obtained from the GMM analysis.

5. Conclusions and Suggestions

Previous studies have tested various research models of corporate capital structure and provided mixed results regarding the factors that influence capital structure in various corporate sectors. This study contributes to the capital structure literature by proving that income diversification can be a determinant of the capital structure of international banking companies.

The results of this study show that the income diversification carried out in international banking practices affects the company's capital structure in a positive direction. In other words, the higher the bank's ability to diversify its income (in the form of non-interest income), the more likely the bank will be to increase its short-term debt (placement of third-party funds). This makes sense because the community perceives that the bank is an institution that can be trusted and provides a sense of security when receiving these services (Meslier et al., 2014). The assumption that banks have clear rules and strict regulations from the government is an added value for service users to trust banking institutions in the security of carrying out financial activities (Li & Zhang, 2013). Therefore, the findings of this study support the opinion put forward by the trade-off theory (Fischer et al., 1989; Kraus & Litzenberger, 1973) that companies have a tendency to increase their debt structure to a balance between benefits and costs, which may arise as a result of the use of the debt.

| Determinants | Expected Signs | Outcome Signs | | ns | | |
|---|----------------|--------------------------|-------------------|-------------------------|--|--|
| | | STD _{it} | LTD _{it} | TD _{it} | | |
| Income diversification (IDIV _{it}) | +, TOT | + | - | + | | |
| Profitability (PROF _{it}) | -, POT | - | - | + | | |
| Growth (GROW _{it}) | +, TOT, MRT | + | - | - | | |
| Tangibility (TANG _{it}) | +, TOT | + | - | - | | |
| Firm Size (SIZE _{it}) | -, POT | - | - | - | | |
| Non-debt tax shield (NDTS _{it}) | -, TOT | - | + | - | | |
| Notes: POT (pecking order theory), TOT (trade-off theory), MRT (market timing theory) | | | | | | |

Table 6: Expected and Outcome Signs

Furthermore, Table 6 shows a comparison of the expected influence according to the capital structure theories on the effects found in this study. Income diversification (IDIV), growth opportunity (GROW), and tangibility (TANG) positively affected the short-term debt structure of international banking (STD). These findings support the opinion described in the trade-off theory. Meanwhile, profitability (PROF), firm size (SIZE), and non-debt tax shield (NDTS) negatively affected STD. Therefore, these findings also support the opinion of the pecking order theory in general. This study has limitations that may become a concern and guidance for future research. The sample used in this study generalizes banks in the category of the largest banks in the world so that there could be discrepancies in business characteristics in each country. Future studies may be able to categorize these banks by region and then compare the

results from one region to another. Furthermore, future research is expected to be able to increase the number of research samples so that it can be more comprehensive in explaining the problems of capital structure in the banking world. In addition, further research can try to examine the reciprocal relationship between capital structure and income verification carried out by banks.

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