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The Effect of Financial Distress on Capital Structure in Indonesia Banking Sector

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ABSTRACT

Banking industry is believed as a vanguard of a country's economy. If a bank experiences financial distress, not only that bank will face financial difficulties, but also have a systemic impact on all customers of that bank. So, capital structure of banking industry is a crucial thing. Capital structure in this study is proxied by Leverage Ratio. All of companies need leverage, but if leverage seems too high, it will have bad consequences for the company itself. Then, Banks, which are industry that really needs high liquidity also need leverage. Especially, when financial distress occurs, whether banks need to increase the proportion of their debt or not in order to survive. This research uses 23 commercial banks in Indonesia with quarterly panel data from 2012 to 2022. Results of this study state that Financial Distress can have a significant positive effect on increasing the Leverage Ratio of banks in Indonesia.

Keywords: Leverage Ratio; Commercial Banks

INTRODUCTION

The growth potential of banking shares tends to be stable. Banking sector in developing countries has potential growth because demand for banking services grow along with economic growth (Roubini et al., 2005). This study chooses banking sector because banking sector is regulated and supervised by the government. Therefore, banking sector is generally always transparent and professional in managing public budgets.

Financial distress is a situation when a company experiences serious financial difficulties and has the potential to experience bankruptcy (Altman, 1968). This study use financial distress as independent variable because this can lead to negative impact on the company, shareholders, creditors and other stakeholders.

Capital structure is greatly influenced by financial distress conditions in banking industries. Capital structure describes the composition of funds used by the company, between debt and equity, in financing the company's operations and business expansion (Nurkhasanah & Nur, 2022). Whereas, Leverage is the source of funds of a company that has fixed costs to increase profitability. In the banking sector, the use of debt in particular has a positive impact on funding activities. Large debt might become a burden for the company. However, it depends on how the company manage their capital structure. Therefore, this study use leverage variables as a proxy for capital structure (Giovanni et al., 2020). Capital structure is highly dependent with Financial Distress condition. Many firms are unable to survive because they failed to manage their capital structure well during

crisis. This research may provide valuable insight for investors when facing financial distress situations which can cause changes in capital structure, such as an increase in the proportion of debt as the company seeks additional funds.

Purpose of this research is to provide a relevant picture regarding the influence of financial distress on capital structure in the banking sector in Indonesia. The results of the study also aim to provide guidance for investors, financial analysts and other stakeholders in making more effective investment decisions and reducing financial risk with variable leverage.

LITERATURE REVIEW

2.1 Probability of Default & Financial Distress

In this research, the probability of default (d1) is represent the risk of bankruptcy or Financial distress condition. Probability of Default in here

$$d_1 = \frac{ln\frac{V_A}{K_t} + \left(\mu + \frac{\sigma_A^2}{2}\right)t}{\sigma_A \sqrt{t}}$$

d1 = *the distance to default*
VA = *the value of the banks' total assets*
Kt = *the book value of the banks' debt at time t*
μ = *the risk-free interest rate*
σA = *the volatility of the banks' total assets*
t = *the term for debt maturity*

Modeling Default Risk was introduced in 2003 by Peter Crosbie and Jeff. It explained the element that influences the probability of default in the form of asset value is a measure of the present value of future free cash flows generated by the company's assets which are discounted again at the discount rate. It measures a company's prospects and includes relevant information regarding economic and industry conditions. The probability of default increases when the asset value approaches the book value of liabilities.

The probability of default is measured by asset volatility, which is the standard deviation of the annual percentage change in asset value. The element that influences the possibility of default is the maturity of the debt. Hellwig (2008) states that excessive maturity mismatches are undesirable from a financial stability perspective. Maturity Mismatch Theory is the theory that best describes how debt maturity influences financial distress. This theory focuses on the mismatch between the terms of assets and debt obligations in a company causing financial distress. Long-term loans have increased drastically in the last decade along with the share of deposits in bank liabilities increasing, which has greatly influenced the maturity structure of the banking sector (Tian & Zhu, 2014). Another element that influences the probability of default is the risk free

interest rate. Bachtriyoh (2013) states that interest rates describe the company's performance in generating share prices and profits. Term Structure Theory is a theory that explains how interest rates affect the probability of default in the context of credit risk

2.2. Bank Leverage Ratio as a proxy for Capital Structure

Leverage ratio is used as a benchmark for capital structure. Capital structure refers to the composition of a company's capital, where the company uses its own Equity and Debt to finance its operations and investments. The main components are Equity (ordinary shares and preferred shares) and Debt includes long-term and short-term debt, such as bank loans, bonds and other loans. Then, bank's leverage refers to the use of loan capital compared to its own capital which also measures the company's ability to repay loans to creditors based on the level of asset use. Examples of bank assets are bonds, deposits, bank balances, shares, securities and receivables. Thus, capital structure will influence the risks, profits and liabilities faced by banks and bank leverage can provide the potential for higher profits or increase financial risk if bank assets experience a decline in value (Permana et al., 2021).

In this research, the relationship between capital structure and bank leverage is relevant because financial distress, namely a condition when a company experiences difficulty paying its financial obligations, can influence the choice of capital taken by the bank to overcome this problem. According to Harahap (2003), leverage is a ratio that describes the relationship between debt and capital by measuring how much a company is financed by debt, where the company's ability is proxied by capital (Pamungkas et al., 2018). Thus, the influence of financial distress on capital structure can cause changes in capital composition which in turn can affect the level of bank leverage and influenced by the financial risks associated with these decisions.

2.3. Economic Environment & Bank Leverage

Two economic environment indicators can affect company's decisions regarding capital structure and debt levels, such as :

1. Growth Domestic Product (GDP): When economic growth is high, banks tend to pursue credit demand and business expansion. For example, banks can use debt or leverage to meet the larger financing needs of companies and customers. Meanwhile, when economic growth is slowing, banks tend to be careful in providing credit and use debt or leverage more wisely.
2. Inflation (INF): When inflation is high, banks tend to reduce the value of the debt because decreasing value of money. On the other hand, when inflation is low, banks tend to increase their debt because customers will choose to borrow money from the bank. However, high inflation can be profitable if a bank has debt in the form of bonds because they can pay back their debt with lower value of money (inflation-adjusted). (Alvin, 2015).

2.4 The Effect of *Financial Distress* towards *Capital Structure*

Balasubramanian et al (2019) stated that the use of debt is normal thing for a firm, but debt can be a backfire for a firm if it is not carefully calculated. Balasubramanian (2019) and Ugur (2022) explain when a company utilize its capital structure well, it will lead to the growth of

income, so dividends can increase and debt can be paid off and the company increase their profit. But, Debt can lead to losses when a company has a difficulty paying back their debts (Ramadani & Ratmono, 2023).

Empirical research by Dani Masardi, Maulan Irwadi & Lukita Tripermata (2021) shows that financial distress has a positive and significant effect on capital structure. Similar research by Erwin Umaiyah and M. Noor Salim (2017) for non-banking companies said that financial distress had a positive and significant effect on capital structure (Salim & Firdaus, 2020).

Default risk model which produces a financial distress model. Crossbie and Bohn (2003) stated there is only a probabilistic assessment of the possibility of financial distress. So, companies pay the risk free interest rate difference in the model in proportion to their probability of default to compensate lenders for this uncertainty. Probabilistic assessment to measure the possibility of financial distress for a company involves probabilistic assessments such as total assets, book value of liabilities, standard deviation, and risk-free interest rate (Modeling Default Risk, 2003).

Financial distress affects capital structure in signaling theory related to company management's efforts to provide positive or negative signals or signs of company's prospects (Spence, 1973). In terms of capital structure, debt issuance is a positive signal to the market regarding potential increase of income in the future. Financial distress affects capital structure in market timing theory, namely the tendency to issue debt or equity based on current financial market conditions (Baker & Wurgler, 2002). Based on several previous researches, theory of signaling and market timing, we propose the first hypothesis as follow :

H1: Financial Distress has a positive and significant effect on Capital Structure.

2.5 Effect of *Economic Environment* towards *Capital Structure*

Economic environment affects capital structure related to periods of strong economic growth, banks tend to expand their credit portfolio. This leads to increasing in bank assets. Meanwhile, during recession, there is a decline in the quality of their assets, which can affect their capital (Alvin, 2015). Previous research by Robert Merton, explained that economic uncertainty could make bank assets guaranteed by loans become less valuable. Thereby, causing the risk of using debt to be higher (Merton, 1974). Economic stability prevent bank failures and greater financial problems (Bernanke, 2013). Therefore, our study uses the economic environment such as Growth Domestic Product (GDP) and inflation (INF) as proxy variables for the business cycle in empirical model research. We propose our second hypothesis as follows:

H2: Economic Environment has a positive and significant effect on Capital Structure.

RESEARCH METHOD

Quarterly Panel Data from 23 public listed Banks in Indonesia has been used as a sample. We retrieved data from S&P Capital IQ Data Plattform, Investing.com, and BI.go.id with period from 2012-2022. Leverage Ratio is taken from Basel-III data which is measured by capital tier-1 divided by total leverage exposure. Indonesia implemented Basel II Framework (Pillar 1, Pillar 2

and Pillar 3) since December 2012, but the Basel III Framework has also been just implemented in Indonesia for liquidity and capital standards, Empirical Model :

$$LR_{it} = \beta_0 + \sum_{j=1}^{j} \beta_j \, . X_{it-1}^{j} + \sum_{m=1}^{M} Z_m \, . l_{it}^{m} + \alpha_{it} + Dum_{reces} + \epsilon_{it}$$

LR_{it} : *Bank Leverage Ratio i* at time *t*

X_{it-1}^{j}: Vector variables that characterize each bank

l_{it}^{m} : Vector variables that captures macroeconomic conditions

α_{it}: Specific factors within each institution (Not observed and do not change over time)

Dum_{reces} value 1 for the recession 0 for normal condition

ϵ : error term

Table 3.1 Definition Operational

Dependent Variable		
1.	Leverage Ratio	$\text{Leverage Ratio} = \frac{\text{Capital Tier 1}}{\text{Total Leverage Exposure}}$
Independent Variable		
1.	Probability of Default	$d_1 = \frac{ln_{K_t}^{V_A} + \left(\mu + \frac{\sigma_A^2}{2}\right)t}{\sigma_A \sqrt{t}}$

Variabel Kontrol		
1.	Total Asset	**Total Asset** = Equity + Debt
2.	Return On Asset	$\text{Return on Asset} = \frac{\text{Net Income}}{\text{Total Asset}}$
3.	Loan Loss Provision	*Market Value* & *Stock Volatility* as a proxy for *Business Cycle.*
4.	GDP	GDP Growth per quarter
5.	Inflation	*Consumer Price Index*.

RESULT & DISCUSSION

Some parameter test have been conducted to to know whether this model use Random Effect, Fixed Effect or Pooled least Square. After conducted some classic assumption test to mitigate Heteroscedasticity, autocorrelation and multicolinearity, this research use random effect model. Table 4.1 shows descriptive statistics results to give brief overview about Indonesia banking industry data. This result shows that average score for Probability of default in Indonesia Banking Industry is quite low, which is 0.2412 comparing with average leverage ratio is 5.789. it means, even though average LR is quite high, their probability of default is still in a safe level.

Table 4.1 Descriptive Statistics

Variable	Obs	Mean	Std. Dev	Min	Max
LR	1012	5,7891	7,0983	0	35,1800
PD	1012	0,2412	0,2778	0	0,6856
TA_Log	1012	6,7835	0,6865	5,4961	8,1083
RoA	1012	1,2053	1,2179	-1,6610	3,2710
LLP_Log	1012	3,6844	1,5400	0	6,0022
GDP	1012	0,0114	0,0246	-0,0419	0,0505

INF	1012	4,1536	1,9552	1,3300	8,4000

Source : Data Processing (2023)

Table 4.2 shows regression result to prove Hypothesis 1 and hypothesis 2 in this study. We also classify four regression results using PLS, Random Effect, Fixed Effect and Random Effect test with macroeconomic factors. Even though, after conducted some paramater test, most suitable model for this study is Random Effect model, but those 4 regression results show majority same result.

Table 4.2 Regression Result

	Dependent Variabel (LR)			
	Polling	Random	Fixed	Random_Macro
	(1)	**(2)**	**(3)**	**(4)**
PD_Lag1	23,6192*** (0,0000)	23,6192*** (0,0000)	23,6447*** (0,0000)	23,4868*** (0,0000)
AS_LOG_Lag1	-0,7145** (0,0460)	-0,7145** (0,0460)	-1,0749** (0,0200)	-0,7715** (0,0320)
ROA_Lag1	0,1916** (0,0150)	0,1916** (0,0150)	0,1649** (0,0390)	0,2069*** (0,0090)
LLP_LOG_Lag1	-0,0388 (0,5260)	-0,0388 (0,5260)	-0,0425 (0,4890)	-0,0467 (0,4480)
GDP				-0,1826 (0,9410)
INF				-0,0446 (0,2130)
dummy_reces:GDP				
PD_lag1:dummy_reces				
Constant				
Observations	1012	1012	1012	1012
R^2		0,8748	0,8701	0,8748

F-Statistic				

Source: Data Processing (2023)

Results shows there is a positive and significant effect of financial distress (projected by probability of default) towards capital structure (projected by leverage ratio) in Indonesia banking sector. These findings indicate that when the level of financial distress increases, banking companies tend to increase the use of debt (Leverage ratio). Based on Market Timing Theory, companies tend to issue debt at the right time to take advantage of favorable market conditions. If companies feel that current market conditions support greater use of debt (such as low interest rates), they can increase their leverage ratio to maximize firm value (Baker & Wurgler, 2002).

Based on financial perspective, results shows when Indonesia banking sector faces financial distress, they tend to use leverage (debt) as a strategy to overcome financial problems and financing their assets. The use of leverage in this situation can provide additional benefits for the company to obtain additional funding sources and maintain liquidity. However, increasing leverage can also increase a company's financial risk, especially if economic condition is getting worse or significant market fluctuations. Therefore, company management needs to consider optimal capital structure policies to deal with potential financial difficulties and credit risks, as well as carry out effective risk management to maintain the company's financial health and long-term operational continuity.

Based on this result, it can be concluded that there is a significant effect of economic environment on leverage ratio in Indonesia banking sector. From a financial perspective, result of this study, show that economic environmental conditions influence the capital structure policies of banking sector in Indonesia. When the economy experiences positive and stable growth, companies tend to use leverage to obtain additional sources of funds to support business growth and take advantage of expansion opportunities. However, when the economy faces challenges or uncertainty, companies may be more careful in taking financial risks and choose to use their own capital or safer alternative funding sources. The results of this research have important implications for the management of banking sector in making smart and strategic financial decisions to deal with dynamics and fluctuations in the economic environment and to maintain the financial health and continuity of company operations due to dynamic economic conditions that may occur.

CONCLUSION

Result of this study proves the influence of financial distress on capital structure in Indonesia banking sector over 10 years period. This study resulted in the following conclusions:

1. Financial distress has a positive and very significant influence on the leverage of a banking industry company in Indonesia. Therefore, financial distress can influence the potential for increased leverage.
2. The economic environment has a positive and very significant influence on the leverage of a banking industry company in Indonesia. Therefore, the economic environment can influence the potential for increased leverage.

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