Capital Structure and Financial Performance of Banks in Indonesia

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Abstract

This research aims to investigate how capital structure of banks relates to levels of profitability, taking into account firm size and effect of Covid-19 pandemic. We present the analysis within the context of Indonesia whereby banking regulations are different to other countries. Extant literature studies the association of leverage, firm size and profitability during normal economic conditions, or influence of Covid-19 pandemic on profitability independently. This research examines all the antecedents altogether. We examine whether increased capital (debt) provided by the Indonesian government affects banks profitability, giving novel consideration to the heightened credit risks emanated by the pandemic. Fixed effect regression is employed to study the effect of leverage, firm size, and Covid-19 pandemic on banks profitability. We find that leverage positively affects banks profitability, while firm size negatively affects leverage and profitability. High debt levels pressures management to meet the required return of shareholders. Larger banks prefer zero-risk government bonds over lending creditors primarily during economic uncertainties. Covid-19 pandemic has no effect on banks profitability. We expect that banks in Indonesia administer risk-averse investments, ensuring sustainability in the long run.

Keywords

Capital structure, profitability, banks, credit risks, Covid-19 pandemic

1. Introduction

The capital structure of a company refers to the combination of debt and equity to fund its operation. A firm finances growth through issuance of stocks, debt instruments or internally generated from reinvestment of profits (Chen, 2021). Financial structure determines the risks borne by investors, firm profitability as well as the fulfilment of shareholders' needs (Chang et al, 2019; Flannery and Rangan, 2006). The trade-off theory, pecking order theory and market timing theory explaining capital structure originate from Modigliani and Miller proposition (1958) that in perfect capital markets where taxes, transaction costs and information asymmetry are absent, financing strategies do not affect firm value. Notwithstanding, the theorem does not hold in the real world as tax advantage of debt increases firm value (Chang et al., 2019; Sheikh and Wang, 2013). In this setting, a firm should maximize their debt proportion for deductibility of interest.

Studies on the field of capital structure and financial performance are diverse, using proxies of equity or debt and have been done in many countries (Abor, 2005; Badawy, 2020; Sheikh and Wang, 2013; Shubita and Alshawalha, 2012; O'Conell, 2022). The scope of these researches extends from an investigation of banks profitability at bank-specific, industry-specific to macroeconomic level. O'Connell (2022) demonstrated that banks' profitability is associated with equity-to-asset ratio, interest rates and inflation. Venanzi (2017) documented that capital structure choice is inconsistent across countries due to the diverging macroeconomic characteristics. Chang et al. (2019) similarly find that the association of financial performance such as asset growth on profitability is different in Asian countries. For this reason, the authors limit the scope of the study to financial institutions in Indonesia, whereby the economic and political environment is dissimilar to other emerging markets.

Banks in Indonesia appear to have strong financial positions. In 2021, Indonesian Financial Services Authority recorded CAR and ROA of 25,7% and 1,85% respectively (OJK, 2022). Customer deposit and savings are the primary source of fundings for commercial banks, succeeded by loans, while non-banks third party credits, securities, and reserves in Bank Indonesia are the major investment instruments (ibid.). The Indonesian financial market resembles a typical Asian bank-based financial system whereby the banking sector plays the role of intermediary and capital provider (Salike and Ao, 2017). Considering the risks of insolvency, regulations require banks exceed the minimum capital of Basel II and Basel III that are 8,5% and 10% respectively. Both commercial and state-owned banks are in the phase of adopting digital infrastructures, partnering with financial technology firms to thrive in the shifting banking landscape.

In the light of the Covid-19 pandemic effect on global economies, banks in Indonesia are equivalently exposed to nation-wide economic slowdown and decreased number of credits (OECD, 2020; Katusiime, 2021; Widyastuti, 2020). Majority of research studying the impact of Covid-19 links increase in credit risks as a result of the current economic conditions (Ichsan et al., 2021; Siddique and Khan, 2021). Given the current economic uncertainties brought by the Covid-19 pandemic, this research specifically addresses how a bank's capital structure and size relates to its profitability in the Indonesian context. Banks have been facing lower weighted average risk assets as the number of customer credits plummet. The government injected additional capital to state-owned financial institutions in aims of regaining the trust of financial institutions and increasing the capital adequacy ratio. Nevertheless, the outcome remains unknown as credit risks remain high. For this reason, it is important to evaluate how elevated default risks would influence a bank's profitability. Majority of previous literature studies either the relationship of profitability of banks during the Covid-19 pandemic or the influence of capital structure on profitability in a normal economic condition, thereby not taking into account the effect of economic uncertainties. Our study differs from the existing literature by evaluating banks' leverage, with respect to their sizes and the effect of heightened credit risks caused by Covid-19 all together.

1.1 Objectives

Extant literature finds mixed results based on the adoption of one variable alone, this research aims to settle the heterogeneity among research on capital structure and profitability by employing non-performing loans, a significant measure of profitability in financial institutions. The contribution of this research is twofold. Firstly, we present the findings with regards to an analysis of the unique economic conditions and banking regulations in Indonesia. Secondly, the research gives an updated knowledge on the effect of Covid-19 on banks profitability, in relation to credit risks that deter interest income and capital of banks (Salike and Ao, 2016). To the best of the authors' knowledge, there is limited study conducted in the Indonesian setting. While regulators have responded to negative effects of the pandemic towards banking systems, the outcome of these measures is still unknown. The scope of this current research is limited to bank specific factors (i.e., microeconomic level), not involving GDP growth or inflation rate. The research emphasizes on analysing the causal relationship between leverage and profitability, firm size as well as the current Covid-19 pandemic.

2. Literature Review and Hypothesis Development

Corporate financing decisions are complex and different across financial institutions, based on internally developed financial policies (Fauzan and Kuswanto, 2018). However, literature examining the relationship of capital structure and profitability in developing countries especially in South-east Asia is still limited. Krishnan and Moyer (1997) performed a study from SEA regions and observed that country of origin affects both capital structure and financial performance (Sheikh and Wang, 2013). Stated simply, macroeconomic environments affect the capital structure of a bank. Using sample firms in Ghana, Abor (2005) demonstrates a significant positive relationship between short-term debt to total assets and ROE. From another point of view, Chang et al. (2019) found that firms in Asia with higher profitability engage less in debt financing. A recent study in the context of Covid-19 outbreak shows that there is growth of zombie lending among over-capitalized banks and an increase in deposits of banks. The relationship between capital structure and financial performance in banks during normal economic conditions and recessions remains unclear. Empirical evidence shows mixed results, regardless of similar samples in emerging economies, and the fact that most of them are grounded on the theory by Miller and Modigliani (1963).

The inconsistency between Miller and Modigliani (1958) theorem and real-world practice is attributable to information asymmetry or the effect of corporate taxes. Leverage decreases a manager's freedom in making decisions, making them confined to less risky investments whose returns are lower than those promising higher return, despite the cost

of higher risk. Harun et al. (2021) suggests that banks being highly leveraged, have the ability to determine the appropriate amount of capital to support unpredicted losses arising from its daily transactions. Such eventuality unsettles the initial MM theorem (1958) whereby bankruptcy costs do not affect firm value (CFI, N.d.). As changes in capital structure affect cost of equity, it is important to examine whether high debt proportions enhance profitability. We present profitability using return on equity as net assets are associated with cost of equity. This research implicitly assumes that banks have allocated the optimal capital structure which maximizes shareholder value (i.e., below its optimal limits).

2.1 Leverage and bank's profitability

The performance of a firm is influenced by its financial decisions (Mahmood et al., 2019). High leverage and a loan-to-deposit ratio led to poor return on investment and decrease in liquid capital (Budhathoki, 2020). High equity capital benefits a bank's profitability by lowering funding costs, enhancing creditworthiness, lowering the need for external funding, and enhancing depositor safety during periods of macroeconomic turbulence (Paolucci, 2016; Tan, 2017; Sufin and Kamrudin, 2012; Ha,2020). Capital markets are yet to be efficient in emerging economies like Vietnam, in which cost expectation of finance difficulties reduces (Ha, 2020). While the eventuality is true in developing economies, equity as a source of funds is more expensive than deposits, raising the bank's cost of capital and hence calling for a greater margin.

Kusi et al. (2015) argued that leverage boosts banks profitability up to an optimal limit in Ghanaian banks. Cost of debt above these points however, erodes profit margins and asset turnover especially when borrowing costs are high. The employment of more debts would increase cost and risk of equity, consistent with the theory of Miller and Modigliani (1963). Increase in interest burden (rewards for banks in increasing leverage) increases banks profitability for the reason that higher degree of leverage allows deposit mobilization. Banks may pay less interest on the deposit they employ and charge higher rates on loans (ibid.). Bunyaminu et al. (2021) explain that the absence of consensus is due to the differences in measurements of profitability and leverage. The research employs ROE and NIM to represent banks' profitability. Despite the same research setting in Ghanaian banks, they find that leverage negatively affects profitability. Debt financing is more costly than internally generated funds such as retained earnings, therefore reducing the profitability of banks. Alike, Sheikh and Qureshi (2017) finds that leverage adversely affects profitability among conventional and Islamic banks in Pakistan.

Trade-off theory argues that target debt ratios are higher for companies with real assets and more taxable income to preserve. Financing with debt over equity increases total after tax return, reduces the free cash flow problem and enhances firm value (Sheikh and Qureshi, 2017). Firms determine capital structure by evaluating the costs and advantages of acquiring additional dollars of debt. Among the expenses of debt are bankruptcy fees and shareholder-debtor agency conflicts (Fama and French, 2002). The counter-argument to the initial proposition by Miller and Modigliani (1958) is that higher dependence on debts increases risks associated with bankruptcy and failure to repay loans. While creditors are entitled to the firm's assets in the event of corporate liquidity, shareholders have to bear the risks of losing their investments almost entirely. Having said this, shareholders will require higher return from their investments as debt proposition and business risk increases. Within this setting therefore, firms are driven to increase their profitability to meet the required returns of shareholders' equity investment. Based on this theoretical background, this research hypothesizes that higher leverage leads to higher profitability.

2.2 Leverage, firm size, and bank's profitability

The pecking order hypothesis states that businesses give the highest priority for internal cash, debt, and equity when debt capacity is at its maximum (Myers, 1984; Myers and Majluf, 1984). Sundas (2019) examined that company size is inversely associated with the total debt ratio (short and long-term) in line with the pecking order theory. Debt instruments are viewed as expensive sources of capital, and businesses favour short-term financing over long-term bank loans. Adelopo et al. (2017) study on global economic recession and factors of banks' profitability in West African states found that cost management, liquidity, and size impact ROA. Larger firms are less inclined to debt for having better access to equity financing and internal finances (Sundas, 2019). Small firms are financially more constrained, often faced with unfavourable debt conditions and higher interest charges (Fazzari and Petersen, 1993; Mahmood et al., 2019). Notwithstanding, Mahmood et al. (2019) exploring Chinese firms found that firm size positively influences (i.e moderates) leverage and profitability, attributable to the banks' market reputation and high asset value. Bunyaminu et al. (2021) demonstrate that banks profitability increases with expansion. Larger banks are able to undertake strategies to diversify which is believed to boost profit (Yakubu, 2019). Sheikh and Qureshi (2017)

further confirms that bank size is positively related with leverage, profitability and capital structure as larger banks have better risk management, attracting more depositors. Regardless of the theoretical rationales, the key takeaway is a linkage exists between leverage and profitability through the interference of firm size. This research employs two measures of firm size- total assets and classification of BUKU BANK. The latter variable takes into account a unique banking environment to Indonesia. BUKU BANK is a classification of banks based on the amount of acquired capital as regulated by the Financial Services Authority through POJK No.6/POJK.03/ 2016.

2.3 Credit risks

A bank's ability to pay its obligations and the amount of credit it extends to borrowers are impacted by high levels of NPL in the banking sector (Çollaku and Aliu, 2021; Psillaki et al., 2010; Kithinji, 2010). Corporate debt overhangs are closely related to high NPL rates, inhibiting investment and delaying economic recovery (Aiyar et al., 2015). At the microeconomic level, Ayunku and Uzochkwu (2020) found that accumulation of bad debts leads to a more stringent management attitude towards credit lending, evident from the underutilization of customer deposits. Bhattarai (2016) explained that when a loan is non-performing, chances of it being repaid in full are substantially reduced. Bernanke (1983), Bernanke and Gertler (1989), and Bernanke et al. (1996) stated that high NPLS tie up capital as provisions mount, weaken balance sheets, restrict credit and lending potential to the real sector.

Salike and Ao (2016) confirmed the cogitation by accommodating macro banking environment- real GDP growth. As banks endorse risky policy simplifying the standards for lending to clients having less charges or current assets to put up as collateral, likelihood of default increases. On the other hand, impaired loans can be minimized with conservative credit policy, establishing rigorous filtering procedures and conducting thorough study of the customers' past and ability to repay. Eliminating non-performing loans hence removes ambiguity on banks' underlying capital situation, enhancing the state's economy (ibid.). Non-performing loans are used as control variables in this study considering the consistency among literatures and impact on profitability.

2.4 Profitability of banks during Covid-19 pandemic

Global financial crises and the Covid-19 pandemic had a significant influence on bank earnings. Kohlscheen et al. (2018) discovered that high short-term rates increase cost of capital, reducing banks profitability, while the reverse is observed for high long-term rates. Earnings are affected by the cost of capital for systemic risk, emphasizing the significance of good fiscal and monetary policies for macroeconomic stability (Katusiime, 2021). On a larger perspective, impact of Covid-19 pandemic on banking industry is more pertinent in advanced than emerging economies being the primary providers of financial services (Barua and Barua, 2021; Damak et al., 2020). Elnahass et al. (2021) agreed that the pandemic negatively influenced both financial stability and performance, comparable throughout global finance sectors, country income levels and bank characteristics.

Barua and Barua (2021) similarly found that the pandemic negatively affects banks' capital adequacy ratios, interest income, and risk-weighted asset values, with larger banks likely to be hit harder. In severe NPL plunges, decreases in the aforementioned financial indicators are disproportionately worse. Katusiime (2021) studied firms in Uganda while controlling for bank specific and macroeconomic drivers of bank profitability. Growing NPL owing to poor credit quality, low interest revenue and high provisioning expenses affects profitability in the immediate run. In the long run, however, NPLs are positively related to profitability as high credit risks in developing economies drive banks to boost interest margins, compensating for default risk.

The Covid-19 crisis prompted a dramatic increase in business and consumer loan defaults, negatively impacting banks' financial performance and capacity to provide credits and help economic recovery (Minney, 2020; Tyson, 2020; Barua and Barua, 2021; Katusiime, 2021). Overdraft of customer bank accounts driven by economic uncertainty reduces banks' deposit levels. Even though the reduction in liquidity (i.e., customer deposit) is slight, Badawy (2020) discovered that Covid-19 emergence had a significant impact on banks' capital structure. Mateev et al. (2021) investigating the influence of risks on capitalization level of banks finds that banks do increase their capitalization levels in response to higher risks. The phenomenon is observed in Indonesia. Creditors' inability to pay, low credit approval as well as reduced deposits causes drastic fall in banks' risk weighted assets. In response to this, the government injected additional capital to state-owned institutions, raising the capital adequacy ratios again.

Modigliani-Miller's debt irrelevance theorem states that a company's risk is completely defined by the volatility of its assets, with capital structure modifications having no effect on funding costs. Higher debt levels would have no real-

economy consequences (Schanz et al., 2011). Contrary to the supposition, banks struggling with decreased deposits and larger risk of non-performing loans have reduced profitability. The Indonesian government preserved financial stability by injecting additional capital (Wareza, 2020). However, the outcome is uncertain, whether the adverse effects of non-performing loans are averted or credit risks faced by banks remains high (Katusiime, 2021). In a normal course of business, added capital provides more cushion, enhancing banks' confidence in providing loans, but this may not be true as the Covid-19 pandemic hits. Henceforth, the research asserts that the Covid-19 pandemic negatively influences the bank's leverage and profitability. The hypotheses are constructed as follows-

H1: Leverage is positively related with a bank's profitability

H2: Firm size moderates the relationship between leverage and banks profitability

H3: The Covid-19 pandemic negatively affects a bank's leverage and profitability

3. Methods

3.1 Sampling method

Purposive sampling is used to study banks listed on IDX, having complied with IPO standards for financial, corporate governance, and organizational requirements. Fixed effect panel regression is used as the Hausman test result is below 0.05 and data is longitudinal. A dummy variable is introduced in the regression equation representing the emergence of Covid-19 pandemic in 2020. Three regression models are used in explaining the relationship between variables employed in this research. The regression models for each hypothesis are thus constructed as follows. β0 is a constant, β1, β2, β3, β4, β5, β6 are the coefficient terms of the variables and ε as an error term.

$$\text{Profitability} = \beta 0 + \beta 1 \text{Leverage}_{i,t} + \beta 2 \text{NPA}_{i,t} + \beta 3 \text{BUKU}_{i,t} + \beta 4 \text{Firmsize}_{i,t} + \varepsilon. \quad (1)$$

$$\text{Profitability} = \beta 0 + \beta 1 \text{Leverage}_{i,t} + \beta 2 \text{NPA}_{i,t} + \beta 3 \text{BUKU}_{i,t} + \beta 4 \text{Firmsize}_{i,t} + \beta 5 \text{Leverage*Firm size}_{i,t} + \varepsilon. \quad (2)$$

$$\text{Profitability} = \beta 0 + \beta 1 \text{Leverage}_{i,t} + \beta 2 \text{NPA}_{i,t} + \beta 3 \text{BUKU}_{i,t} + \beta 4 \text{Firmsize}_{i,t} + \beta 5 \text{Leverage*Firm size}_{i,t} + \beta 6 \text{dummyvarP} + \varepsilon. \quad (3)$$

Theoretical framework is presented in Figure 1. Given the significance of firm size and credit risks, non-performing assets and BUKU Bank are used as control variables.

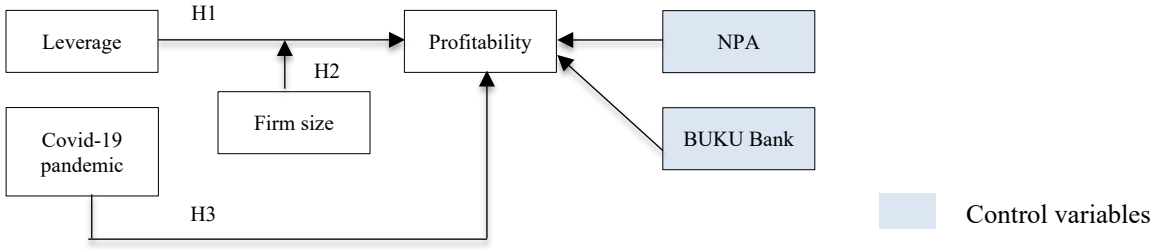

Figure 1. Research Framework

4. Data Collection

Data of 38 banks is collected from Bloomberg Terminal from the time period 2014 to 2021. Measurements of the variables employed in the research are presented in Table 1. Considering the large values of firm's total assets compared to other variables, we aim to diminish the effect of the discrepancies using natural log of total assets.

Table 1. Description of variables

Variables	**Measurement**		**Notation**
Profitability	Return on equity (ROE)	Net income/ total shareholders' equity	*Profitability*
Leverage	Debt to equity ratio (DER)	Total debt/ total equity	*Leverage*
Firm size	Natural logarithm of total asset (TA)	Ln (total asset)	$Frizzies_t$
Leverage* Firm size	Interaction effect of DER and Ln (total asset)	Ln(TA)*DER	$Leverage*Firm\ size_{i,t}$
	Classification of BUKU bank	BUKU 1- common equity < Rp. 1 trillion BUKU II- common equity Rp.1 trillion- Rp. 3 trillion BUKU III- common equity Rp.5 trillion- Rp.30 trillion BUKU IV- common equity >= Rp.30 trillion	$BUKU_{i,t}$
Covid-19 pandemic	Dummy variable	1 denotes pre-pandemic period, 0 for pandemic period	*dummyvarP*
Credit risks	Non-performing loans Rate (Non-performing Loan To Total Loan)	Loan with no repayment within 90days or Loan in doubt to be repaid/ Total Loans	$NPA_{i,t}$

Table 2. Descriptive statistics

	Mean	Std.Dev	Min	Max	N
Profitability	3.41%	15.00	-90.31%	27.04%	301
Leverage	0.59%	0.61	0%	314%	
Firm size	30.99	3.61	0	35.1	
NPA	3.13%	2.48	0	22.27	
dummyVarP	0.25	0.43	0	1	
BUKU	3.36	0.75	1	4	
Leverage*firm size	18.72	19.20	0	94.72	

As presented in Table 2. above, the average return on equity of banks in Indonesia stood at 3.41%, with a debt-to-equity ratio 59% over the last eight years. The industry's average non-performing loans rate is relatively stable at 3.13%. Majority of listed banks have total assets above Rp.3 trillion, classified as BUKU II or III.

5. Results and Discussion

5.1 Graphical results

Figure 2. Indonesian Banks Performance Averaged
Source: Authors research

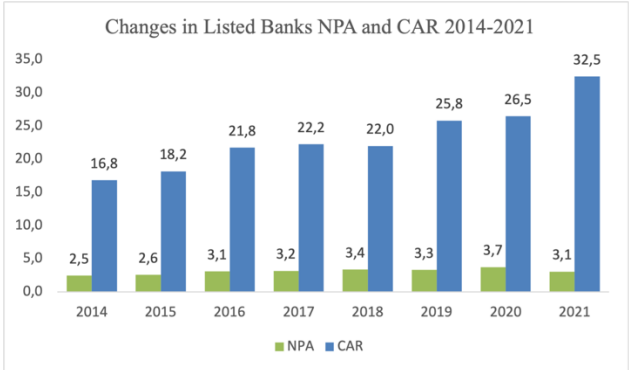

Figure 3. Changes in NPA and CAR averaged
Source: Authors research

Figure 2. above compares changes in banks ROE and DER over the course of the last eight years. Profitability of banks in Indonesia is highest in 2014, followed by a downtrend in the subsequent years. Majority of banks classified as BUKU III and IV have increased equity, but are not followed by a proportional increase in net income, while banks in BUKU I and II incurred significant losses during this two-years period, resulting in a decline of ROE. Leverage increases during normal economic conditions in the first seven years, peaking in 2020. Debt levels decreased significantly post Covid-19 pandemic. As described in Figure 3. NPA was highest in 2020, this was however followed by the increase in capital adequacy ratios from injection of additional government capital especially among state-owned enterprises.

5..2 Correlation analysis

Table 3. Correlation analysis

	Profitability	Leverage	Firm size	NPA	dummyVarP	BUKU	Leverage* firm size
Profitability	1.000	-0.003	0.241***	-0.469***	0.068	0.383***	0.019
Leverage	-0.003	1.000	0.187**	0.071	0.035	0.229***	0.998***
Firm size	0.241***	0.187**	1.000	-0.152**	-0.099**	0.366***	0.210***
NPA	-0.469***	0.071	-0.152**	1.000	0.083*	-0.163**	0.059
dummyVarP	-0.068	0.035	-0.099*	0.083*	1.000	0.099*	0.038
BUKU	0.383***	0.229***	0.366***	-0.163**	0.099**	1.000	0.267***
Leverage* firm size	0.019	0.998***	0.210***	0.059	0.038	0.267***	1.000

Based on the results of correlation analysis in Table 3., variables are not strongly correlated to one another aside from the interaction between leverage and firm size with standalone leverage variables. Largest total assets are associated with increased profitability, and increase in non-performing loans decreases banks profitability.

5.3 Fixed effect panel regression

Table 4. Fixed effect regression results

	Model (1)	Model (2)	Model (3)
Leverage	1.51 (0.921)	103.84** (2.99)	101.38** (2.904)
Firm Size	0.096 (0.442)	0.151 (0.703)	0.14 (0.638)
NPA	-1.69*** (-5.097)	-1.61*** (-4.9)	-1.575***(-4.745)

BUKU	-0.69 (-0.308)	0.404 (0.182)	0.860 (0.371)
Leverage*Firmsize		-3.33** (-2.953)	-3.25** (-2.86)
dummyVarP			-1.03 (-0.685)
Constant	8.360 (0.743)	0.845 (0.088)	-12.029 (-1.102)
Adj. R-square	50.6	52.0	51.9
Increase in R-square	4.5	7.1	6.2
F ratio	8.48***	8.733***	8.52***

*Significant at 0,1 **significant at 0,05 ***significant at 0,01

Results of the main fixed effect analysis is explained in Table 4. Leverage, non-performing assets and the interaction terms between leverage and firm size have significant impact on banks profitability. Effect of NPA remains consistent throughout the three models, while leverage and moderating effects are slightly inconsistent. Contrastingly, firm size based on total assets and BUKU Bank as well as Covid-19 pandemic has no significance on banks profitability.

5.4 Analysis

At a significance level of 0.05, leverage favourably impacts profitability. As more customers deposit money, profitability of the bank is increased and debt ratios are increased up to ideal levels (Kusi et al., 2015; Bunyaminu et al., 2021). According to the research, the tax shield effect's advantages outweigh the costs and hazards of large levels of debt. Internally generated funds have lower costs (Sheikh and Qureshi, 2017). Despite the negative coefficient, the relationship between leverage and profitability is moderated by the firm size indicated by total assets. Our research reveals a unique phenomenon in Indonesia's banking sector. Larger banks typically give out loans with more consideration. As an alternative investment, big banks prefer to invest in government bonds with no risk than consumer loans. Both strategies would bring in money for the bank, but the risk involved is different as risks of loans are higher in uncertain economic times. Government bonds offer lesser returns but serve as a good liquidity cushion. Drawing a line from the three regression models, leverage alone has no weighty effect on profitability, however when banks have adequate assets (including equity) liquidity risks and bankruptcy risk is less likely. In other words, leverage has to be superseded by adequate asset value to cover risks of high debt dependence. In regards to H2, we argue that scale inefficiencies or inadequate capital management may cause large, heavily leveraged banks to collapse. Low ROE is due to the huge assets not compensated by increase in net income. Several Indonesian emerging banks are implementing digital infrastructures. The disparity between total asset values and net income is most likely a result of the high initial investment expenses. Investment returns are not always realized in the initial years after an asset is acquired. The money allocated to these investments may as well be used to maintain banks' solvency in the long term.

Regardless of the insignificance of Covid-19 pandemic towards banks' profitability, non-performing assets significantly, and negatively affects return on equity. High levels of non-performing assets in Indonesian banks reduce profitability levels. We present how increasing credit risks would reduce interest income and probabilities of loan repayment, eventually deterring the banks' reserves and financial stability. Poor loan management put depositors at risk, inducing an excessive saving/deposit withdrawal, therefore driving banks into further insolvency (Psillaki et al., 2010; Çollaku and Aliu, 2021). It appears that non-performing loans possess the most significant influence on banks profitability. This research also finds that the effect of firm size as a standalone variable on ROE is insignificant. It can be presumed that huge firm size does not necessarily translate to high profitability. There are two factors leading to such conclusions: (i)efficiency in wealth/ asset management varies across banks and (ii)a huge proportion of the total assets are non-operational assets. Likewise, BUKU bank in association with a bank's profitability ROE is positive but insignificant. Classification of a bank in BUKU IV does not always translate to high net income relative to total assets. Management of banks are at individual level and cannot be generalized across BUKU banks.

5.5 Robustness test

For the robustness test, return on equity was regressed against measures of leverage, credit risks, firm size, and Covid-19 pandemic. Using multiple regression, we examine the consistency and validity of the model along with the coefficients. Results generally converge to the fixed effect analysis. Effect of non-performing loans, BUKU classification, leverage on banks profitability is significant at 0,10 level. Coefficient of leverage and the interaction effect notwithstanding, are disparate to the main model. Results of the multiple regression is summarized in Table 5.

Table 5. Robustness test

	ROE
Leverage	-38.25 (-1.68)*
Firm Size	0.228 (1.025)
NPA	-2.38 (-7.99)***
BUKU	5.066 (4.03)***
Leverage*Firmsize	1.18 (1.62)
dummyVarP	-2.00 (1.19)
Constant	-12.22 (-1.63)
Adj. R-square	31.9
F ratio	24.47

*Significant at 0,1 **significant at 0,05 ***significant at 0,01

6. Conclusions

The study examines the relationship between capital structure and bank profitability. Leverage up to an optimal limit will raise firm value according to the theory of Miller and Modigliani (1963). We argue that as debt propositions and company risk rise, shareholders demand higher return on investments. The research finds that a bank's profitability increases with an increase in debt-to-equity ratio. Based on the theoretical background, credit risks arising from borrowers' inability to repay loans and economic unpredictability affect banks' profitability. Even though credit risk is not entirely captured in the Covid-19 pandemic variable, non-performing assets have a negative impact on bank profitability. The rationale remains valid, so the short time during the pandemic may have accounted for the insignificance.

In regard to the moderating effect of firm size, this research claimed that profitability of larger banks is decreased as debt and total assets reach an excessive level and not followed by adequate increase in net income. Banks need to be cautious when choosing the appropriate level of debt and equity that is neither too low to reduce the advantage of the tax shield nor too high to run the risk of diseconomies of scale creep (Humphrey, 1990). Given this possibility, banking sectors may need to focus on consolidation of bank activities rather than expansion. This study validates Miller and Modigliani's (1963) argument on the impact of leverage on profitability in terms of its theoretical ramifications. Even while results from studies of non-financial institutions are still inconclusive, including solely banks strengthens the conclusion. Debt acquisition makes it possible to raise capital and, as a result, consumer credits. Large-scale asset acquisitions are not always indicative of increased profitability. To create interest income, debts that are recorded as current liabilities of client deposits must be mobilized appropriately into loans. The scope of a single-country study is a limitation on the research. Despite the polarity caused by the Indonesian government's capital injection, we do not consider whether the bank is a state-owned corporation or a privately held business. Banks can be categorized as state-owned or privately owned, and they may use return on assets rather than just return on equity as a guideline for future study. High leverage banks have low equity to liability ratios, which results in a high ROE when it is calculated. Finally, this study might be expanded by examining how indebtedness and profitability change during economic downturns.

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