

PROFIT MAXIMIZATION THROUGH CAPITAL STRUCTURE MANAGEMENT IN BANKING SECTOR

Empirical Evidence from Indonesian Public Banks

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Abstract

This study investigates the effect of capital structure management on profitability in Indonesian banking sector during 2006 to 2015. The result shows a positive correlation between capital ratio and bank profitability in terms of ROE. When stock's abnormal return represents profit, a different relationship is observed. Other determinants of capital structure such as non-performing loan and firm size show a significant proof of their negative interaction to profitability. Loan share is found to have a positive impact on ROE exclusively to big banks while an unclear relationship is found between leverage ratio and profitability.

1. INTRODUCTION

On the edge of crisis, capital structure strategy is essential for banks survival. In Asia financial crisis of 1997, Indonesia was severely damaged as a chain to the collapse of Thailand's Baht. Previously, Indonesian banking sector seemed to be working properly in supplying US Dollar, but owing to many companies holding debt in US Dollar plus Rupiah depreciated relative to US Dollar, their debt skyrocketed. The public started to lose faith in Rupiah and worsened the situation by selling it in exchange for US Dollar. Eventually, the whole banking industry crumbled due to clients' sudden withdrawal of accounts, forcing government bailout to restructure the entire industry.

Capital structure theories attempt to grasp the best mixture of debt and equity to finance business operation. Banking sector has been a unique case according to its special function and regulation. Two of banks primary functions are accepting deposits and granting credits, the former implies significant influence to alter the capital structure while the latter plays a role in profitability section (Kwan S, 2009). Financing preferences matter most when specific circumstances occur, for instance, financial crisis. Great amount of money flights out of bank within days and to be able to absorb the shock, bank must maintain adequate level of capital reserve or low level of leverage, considering total assets and off balance sheet items (de Bandt, 2014). The rationale of this capital structure requirement is bank must be socially efficient to prevent financial instability in economics.

Trade-off theory explains that growing debt to equity ratio (DER) intensively would increase the cost of financing which consequently distorts lending activity, jeopardizing bank overall performance. Assuming there is no asymmetrical information between bank and investor, general corporate finance theory works, in the sense where the increase in capital would expose less bankruptcy risk and thereby less return. Besides, higher debt ratio lowers tax earning due to more tax shield from interest deductibility (Modigliani and Miller, 1958).

Nonetheless, the theory only holds for a one-time period. In short-run perspective, it allows the raises in earning to increase capital ratio in the form of retained earning given marginal profit is not fully paid out in dividend (Berger, 1995). In long-run perspective, the bank's total capital is the sum of all retained earning plus initial equity. Thus, more profitable banks need less capital buffer knowing their internal-generated fund is sufficient to finance temporary valuable

investment. Hence, higher capital ratio signals well-performing bank (Milne et al, 2002).

To be able to assess deeper on bank profitability, components of the sources should be identified. Banks provide loans in the forms of credit cards, mortgage, and debt issuance. Most of the crediting activities require the managers to process credit limit and evaluate credit score of clients as a base for future concerns with potential clients. In agency cost view, higher capital buffer might slacken managers into taking inappropriate action which is not on behalf of stakeholder. Managers may be blinded by their ambition to maximize the total assets' potential and therefore recklessly search for clients, which could end up engaging with risky customers with a higher probability of bad credit. The subprime mortgage crisis in 2008 alarmed stakeholders to increase monitoring when big money was involved. In return, this could explain the positive relationship between capital ratio and bank performance (de Bandt et al, 2014).

Banks optimal capital ratio varies over time. The most plausible explanation is the high correlation between the banks' profitable instruments and business environment. For example, having less capital lead to greater financial distress, especially the deadweight cost of bankruptcy. It is defined as the probability of bank failure times the deadweight liquidation costs that must be incorporated by creditors in the event of failure (Berger, 1995). This cost could surge up considerably if the economy and business fall short. As liquidation cost is uncontrollable, the only way to suppress the cost would be minimizing the probability of failure. The best mean to achieve it is by increasing capital ratio, in a sense it reduces interest payment on uninsured debt and pulls up expected ROE, all else equal. However, if exogenous factors enhance the risk of bank industry failure then most of the banks would be below their equilibrium ratio, and those who were faster in increasing equity would have better ROE performance. For the record, this risk does not increase just any banks ROE, it lowers all of them, but it lowers less for those who promptly raise capital to the new equilibrium (Berger,1995).

Banks' business plan may influence capital structure as well. For instance, banks who prioritize market share might incessantly be seeking for clients causing leverage to skyrocket. Meanwhile, banks who aims to acquire other financial company may prefer higher capital ratio to achieve a satisfying adequate capitalization in the consolidation (Berger et al., 2008).

Minimum capital requirement is a form of protection mechanism from the government for excessive risk-taking behavior by banks. Two probable outcomes could be observed. First, it works fine as banks invest in less risky portfolios, and second, it decreases banks' charter value (Hellman et al, 2000). Keeley (1990) contrasts this argument as he found the significant decline in charter value when the rate of failure increased. To shed a light, Thakor (1996) discovered the shifting behavior from relying on the loan to low yield securities as higher capital requirement regulation is imposed. As a result, this investment style decreases bank profit as they bear less risk and indirectly, decreases bank charter value.

Even though many conceptual views on how capital structure affects profitability exist, the evidence is still unclear. This paper would investigate on how capital structure management affects bank profitability in term of ROE, particularly in Indonesia recently (2006-2015) as only few research was done. Greater extent, this paper has been improved by adding more supplemental variables related to bank capitalization which might have a correlation with profitability such as loan and size. Also, conservative accounting view would argue that ROE has greater tendency to decrease as a systematic effect of dividing the same amount of earnings with a larger number of equities thereby equity-lagged dummy is included to capture this accounting effect if equity t_0 increase from $t-1$. In addition, market-based profitability is added to capture investors point of views.

The result suggests that capital ratio does affect bank profitability in two ways; positive if ROE is the proxy of profitability and negative when abnormal return used. Leverage positively matters in market point of view. However, there is not enough evidence to validate its real impact on ROE even though positive correlation is found. As for loan share, a positive correlation is found given loan is one of the most profit generating instruments yet the evidence shows this only applies to big banks. Meanwhile, non-performing loan is discovered to have a noteworthy negative impact.

For the remainder of the paper organized as follow. Section 2 describes literature review and hypotheses building. Section 3 explains the data collection and research methodology as well as the robustness check in detail. Section 4 presents the interpretation of the result and discuss the explanation comprehensively. Section 5 sums up the whole paper in conclusion followed by possible development for future research. Section 6 and 7 contain the references used and appendix respectively.

2. LITERATURE REVIEW

2.1 How Capital affects Banks' Profitability (ROE)

In Modigliani & Miller's perfect capital market framework (1958), firm's value equals the total cash flows generated by the assets, therefore, neither debt or equity financing matters. Derived from the weighted average cost of capital (WACC) equation, higher debt to equity ratio consequently followed by higher expected return on equity in the sense where equity holder now involved in increased risk associated with debt. Nonetheless, this principle is not relevant to M&M theory while in tradeoff theory where leverage is deliberated, debt is a double-edged sword. This approach acknowledged that leverage has the tax benefit from interest payment. Issuing bond hence lessen tax liability of company while paying dividends on equity does not. As good as it may accomplish, successfully acquiring an immense amount of debt requires a solid record of meeting prior borrowing commitments. Furthermore, high leverage implies huge covenants and limit freedom of action accordingly. Nevertheless, Banks would implement optimal capital ratio which maximizes its value (Buser et al., 1981; Berger et al., 1995).

Market discipline restraints bank from exercising excessive leverage given investors are sensitive to default risk, indicating highly levered banks might get punished at a high price (Nier et al., 2006; Flannery et al., 2008). This market protection mechanism has weak legal punishment power hence it is taken over by government's regulation of imposing deposit to the central bank as insurance. The positive view on this, the discipline procedure causes bank managers avoiding the issuance of uninsured debt. Owning this debt could reduce charter value (calculated as the total net present value of future cash flow) which may seem unfavorable for future business partners, accordingly, it provides a disincentive to increase debt. Instead, holding more capital buffer and engaging in less risky portfolios would be a more favorable outlook for them.

In contrast, Berger and Bouwman (2013) stated that banks often argue that tighter capital requirement would slow down the performance in sense bank shifts from relying on the loan to low-yielding securities. However, higher capital allows managers to take actions freely overcoming agency conflicts arises from information asymmetric between bank debtors and creditors (Holmstrom et al., 1997). Furthermore, when capital ratio increases, the potential

losses would appear to be caused by the lack of internal control, therefore, stakeholders will request tighter monitoring on their ongoing loan. If banks can collect their future investment, their probability of surviving increases and this would be a point of consideration by business partners (Allen et al., 2011).

Equity holders' potential gains and losses are limited to the number of shares owned. The use of more leverage would increase their return. Still, debtors are anticipating this by consequently demand a higher premium. This anticipation would limit banks' leverage and therefore lower debt to equity ratio. Vice versa, if banks hold more capital, lower premium required by debtors (supply and demand assumption) is expected which then be followed by higher ROE (Calomiris et al. 1991). The depository insurance to central bank program even strengthens this effectiveness as insured depositors would demand no premium even when the probability of default increased. This mechanism could be applied to unprotected debtors who are bought by the sound reputation of the bank (O'Hara et al., 1990).

On the contrary, bank debt is distinguishable from general corporate debt. Due to bank function to accept deposits, the large part of the debt is formed by this deposit whose depositors has no expertise nor incentive to monitor (Dewatripont et al., 1994). As bank may reduce their commitment to monitor the future portfolio pays off, Diamond and Rajan developed "fragile financial structure" banking concept in 2009. The main idea is most financing should be done by the deposits forcing banks to commit in extracting maximum values from the outgoing loans since depositors have legal protection according to banking law. Nonetheless, this scheme would be a disincentive for banks to have higher loan share and thus lead to a decrease in the number of potentially profitable borrowers.

Pecking order theory of financing could also contribute to the debate. Investors assume banks have three sources of funds with each having different signals. The list in order from the most preferable to the least respectively; internally generated earnings, debt, and equity. Pursuing equity most likely seen as an unpleasant signal to investors assuming banks are not willing to take the entire risk of their earning assets and consequently share it with more equity holders. Prior shareholders itself would not be willing to share their profit portion to more investors if it is risk-less. In this idea, a more profitable bank will maintain lower capital in investors' point of view (Myers et al., 1984). For the record, banks still need to meet the minimum capital requirement established by the central bank especially if it is binding, sanction and suspension

of permissions might be charged otherwise. This is a real threat of losing franchise value for the owners (Merton, 1978) hence few analysts and banking experts suggest the obligatory of possessing capital buffer above the safety threshold just in case (Estrella, 2004). Besides, the preference of capital buffer might influence the profitability function corresponding to the pecking order theory (Milne et al., 2002).

If the negative view of holding more capital holds then, net profit and ROE are expected to decrease, meanwhile if positive view holds, ROE is undetermined. The first hypothesis formulated as below:

H1: Capital ratio is positively correlated with Indonesian public bank's return on equity in 2006 to 2015.

2.2 Capturing Accounting Effect

Because this research uses accounting data, lagged data is considered given that actual performance evaluation takes time (yearly basis) to be materialized. In this research, equity lagged dummy variable is included in explaining ROE. It values as one when banks increased their equity after one year and zero otherwise. M&M irrelevance theory would be the fundamental idea with future cash flow would not budge with funding preferences, thereby no expected changes in net profit. ROE has a direct link with capital structure decision since it is computed as net profit divided by shareholder's equity. This dummy will capture the dilution created by accounting effect where ROE decreases as the number of capital increases and net profit stays. This effect is not derived from the increasing equity thus this dummy's coefficient will capture the accounting effect alone, separating the real economic impact. This lead to the second hypothesis as below,

H2: Equity lagged dummy will have a negative relationship with Indonesian public bank's return on equity in 2006 to 2015.

2.3 How Loan affects Banks' Profitability (ROE)

Bank has the role as the catalyst in economic development by funding facility to investors who lack the resources in running their business idea. This provision is in the form of an interest-bearing loan. Conventionally, lending activity is more favorable than investing because the

interest realized on loan is rather sure and guaranteed (Dhiraj et al., 2012). Principally, loan share is the biggest portion of earning assets and therefore dominating the revenue source yet the substantial source of risk as well (Lawrence, 2013). It also captures the extent bank conduct traditional credit activity. Ceteris paribus, the higher the loan share, the higher expected profit earned, disregarding probability of credit default.

Putting into concern the degree of credit default risk exposed, loans that have passed the due will be defined as the non-performing loan. This defaulted loan assumes bank would not be able to obtain the contractual interest as well as the remaining principal, unless if collateral secures the loan. Though, banks must undergo several procedures before the collateral can be auctioned off and according to Indonesian banking law, the sale value is compelled to the unpaid principal plus interest.

Non-performing loans impact negatively on the banks' ability to settle all expenses and taxation, particularly, banks with high loan share in its assets portfolio (Ivashina, 2010). Financial statement study indicates that nonperforming loan has a direct force to lower net profit and ROE afterward. The reason being is these charges on the doubtful loan is treated as an expense on the statement of comprehensive income and adversely affects net profit (Frimpong, 2010).

The third and fourth hypotheses are then developed as below,

H3: Loan share has a positive impact on Indonesian public bank's return on equity in the period of 2006 to 2015.

H4: Non-performing loan has a negative impact on Indonesian public bank's return on equity in the period of 2006 to 2015.

2.4 How Size Affects Banks' Profitability (ROE)

Like other industries, banks also gain from economies of scale and scope (Diamond, 1984). However past empirical research is yet to find a definitive conclusion on whether size does affect bank probability. The previous study by Adusei (2015) and Kosmidou (2008) found that size does positively matter with bank profitability. Economies of scale in cost reduction followed by managerial improvement explain the higher efficiency and profit. In contrast,

Naceur and Goaid (2008) found negative correlation instead. They argue the size variable has a potential of nonlinearities thereby after the accelerated growth in profit, diseconomies of scale hit when the size becomes too big.

The fifth hypothesis is then written as below,

H5: Bank Size has a positive impact on Indonesian public bank's return on equity in the period of 2006 to 2015.

3. DATA AND METHODOLOGY

3.1 Sample Collection and Data Derivation

The samples used for this study were taken from all public banks in Indonesia listed in Indonesian Stock Exchange (IDX) during 2006-2015, retrieved from a combination of Bloomberg and Datastream. There are 44 public banks in the first screening, then additional filters added to exclude newly established or publicized banks which were less than five years and notably small banks with under 750 million Rupiah in assets. This process narrows down the sample to 28 public banks.

To derive the complete data set, computation of the variables is necessary. First, capital ratio is calculated as the equity percentage of total assets. Equity here is using book value instead of market value to avoid market bias such as growth extrapolation which can over or undervalues stock price to determine the total capitalization.

$$\text{Capital Ratio} = \frac{\text{Total Equity}}{\text{Total Assets}}$$

Because all public companies in Indonesia must report their financial statement according to IFRS standard, leverage ratio will be consistent, including banking industry.

The equity lagged dummy variable is defined as one if equity increases from t-1 to t0 and 0 otherwise. This dummy is expected to capture the downward slope effect when larger capital base divides the same amount of profit. In other words, this will separate the accounting effect with the real economic impact. The reason why only one year lagged is included because of the endogeneity of contemporaneous variable, specifically if in t0 profit is positive, this will be added to equity section in t1 therefore without the need for banks to offer equity, it will cause a gradual capital growth instantly given profit is not distributed. If endogeneity is still considered as an issue, Granger-causality test is performed to ensure whether ROE values Granger-cause the lagged values. The result is negative therefore endogeneity problem is clear.

As mentioned in the literature review, business model and plan might influence bank's capital structure, therefore, three variables are taken into considerations; loan share, non-performing

loan, and bank size. Loan share describes the proportion of earning assets allocated to credit activity. This allocation will explain the implementation of bank strategy to generate profit. Moderate level of loan share would indicate the diversification on bank's earning assets while high level means bank still pursues the conservative strategy of relying on constant and certain interest level through the loan. Besides, loan share data over the years shows how banks change their capital structure strategy after the historical 1997 Asia credit crisis and during 2008 global financial crisis caused by US subprime mortgage. Non-performing loan presents the percentage of loan goes default. This variable would capture the counterpart effect of repayment risk.

$$\text{Loan Share} = \frac{\text{Total Loan}}{\text{Earning Assets}}, \text{ Non-performing Loan} = \frac{\text{Total Bad Credit}}{\text{Total Loan}}$$

Firm size affects profitability through the gain on economies of scale (Diamond, 1984) thereby this variable is expected to capture the cost reduction from efficiency or ability to diversify. To proxy size, total assets are used as previous research of firm size by Dang et al (2013) found the total market of equity is suffered from mechanical correlation, therefore, researchers must be cautious with its utilization. Like other financial institutions, natural logarithm is applied to reduce scale effect. If significant effect caused by economies of scale exist, this would be positively related to profit and negatively if diversification presses risk thus lower required return.

$$\text{Firm Size} = \ln \text{ Total Assets}$$

As control variable, debt to equity ratio and bank size are included. The general concept of capital structure is the combination of debt and equity, therefore, DER is included to capture the debt fraction in the liability section to describe banks preference in financing their operation. Debt consists of exclusively to short run instruments to measure its solvability (Niresh, 2012).

$$\text{Debt to Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

3.2 Methodology

To estimate the effect of capital structure on bank's return on equity, fixed-effect panel data regression model is performed. To control for heteroscedasticity, White test is carried out, thereby Hubert/White standard errors are applied. The empirical model follows as:

$$ROE_{i,t} = \alpha_i + \theta_t + \beta_1 \text{Equity-lagged dummy}_{i,t} + \beta_2 \text{Capital Ratio}_{i,t} + \beta_3 \text{Loan Share}_{i,t} + \beta_4 \text{Non-Performing Loan}_{i,t} + X_{i,t} + \varepsilon$$

α_i and θ_t are respectively the bank and time fixed effect, β_s are coefficient parameters, X represents all control variables, and ε is error term. All variables are run in ratio form instead of the absolute value to avoid size bias.

3.3 Robustness Check

Interpreting the result is redundant unless the result is reliable therefore robustness procedures are done in between the methodology. Firstly, endogeneity might be an issue when lagged value is incorporated in the regression. Roberts and Whited (2012) found that fixed effect in panel data is specially tailored to resolve this problem. Secondly, multicollinearity might exist when several variables are indirectly correlated through the third variable which is excluded in the model. Dropping these correlated variables would instead threaten the model from suffering to omitted variable bias. As consequences, variance inflation factor (VIF) test is run to validate the data set. The higher the result indicates a variable is highly collinear with other regressors (Kleinbaum et al, 1988). According to Rogerson (2001), the maximum tolerance of VIF value is 5. Lastly, heteroscedasticity could influence the standard error and lead to imprecise hypothesis testing, subsequently as mentioned in the methodology section, Breusch-Pagan test is performed.

3.4 Descriptive Statistics

Table 2 represents the statistical summary of the variables included in the model. The samples included are 28 public banks in 10 years or less but above five years from 2006 to 2015 leading to 276 observations. From Table 2, each variables' standard deviation is observed to be above the mean. Nevertheless, this is plausible given outliers are not removed. The maximum value of each variable is almost ten times the average plus the minimum value even contains zero or even negative therefore it is understandable where the distribution of the data is less concentrated on the mean. In support, skewness and kurtosis confirm the unbalanced panel data. All variables except ROE has a positive value above 2.717 indicating the right-skewed tendency and left for ROE. Kurtosis of all variables has positive value above 7.993 validating the existence of fat tail.

When the large growth factor on each variable during ten years (presented in Table 4) is considered, it is senseless to believe that the statistical summary displays an inaccurate data distribution, unless it is break-downed to a one-year interval which is not performed.

4. RESULTS

4.1 Robustness Check

4.1.1 Multicollinearity Test

According to Table 5, all variables VIF value is under 1.16 which is far from 5 as the indication of multicollinearity existence. As multicollinearity does not present, all measurements variables are not redundant and robust to proceed to the next procedure.

4.1.2 Heteroscedasticity Test

In Breusch-Pagan test, the $\chi^2(1)$ result is 180.37 and is confirmed for the existence of heteroscedasticity. As the standard-standard error deviates, an adjustment is made by using robust standard error to ensure the reliability of hypothesis testing.

4.2 Fixed Effect Regression Analysis

Table 6 reports the result of fixed effect univariate regression of ROE on the capitalization measures of Indonesian public banks. Capital ratio variable has significant positive coefficient at 1% level denoting that positive view of holding capital holds. Loan share and firm size have a positive coefficient in support with the literature by Adusei (2015), yet both are insignificant in hypothesis testing, therefore, no conclusion can be drawn. As expected, non-performing loan and equity lagged dummy variables are significant and in line with previous findings. Both are negatively correlated with ROE.

In multivariate regression result (Table 7), the result is pretty much similar to the univariate regression except for firm size which is now significant at 90% confidence level and negatively correlated to ROE. Equity lagged dummy also increases in significance to 1% from 5%. In this regression, control variable of debt to equity ratio is included to capture the bank preference of financing and its impact. The coefficient is positive but not significant.

As capital ratio has a significant positive relationship with ROE, positive view of holding more capital holds. After entangling the accounting effect, the real economic impact of the capital ratio is interpreted as 1% increase in capital ratio *ceteris paribus* increase profitability by 0.63%. Supporting explanation by Holmstrom et al. (1997), higher capital ratio allows banks

manager to diminish agency cost due to information asymmetric between bank debtors and creditors. If banks maintain a lower capital ratio, their choice of activities would be limited by covenants to ensure debt holders security. Thereby, they might avoid taking an excessive risk which is more profitable. Besides, Allen et al. (2010) stated that the increases of capital ratio consequently intensifies demand of monitoring by equity holder because higher risks are exposed. If a bank is favoring to offer loan over investing in securities, the non-performing loan could be a huge potential problem for equity holder thereby banks must control on the ongoing credits. Overall, this confirms the first hypothesis.

A negative correlation of equity lagged dummy and ROE is expected. This dummy's primary purpose is to disentangle the accounting effect of appreciation in equity on profitability especially ROE, enabling the measurement of the real economic impact of changes in capital structure. The result presents the evidence where on average, 14% drop in ROE for bank whose expand its equity is a result of the accounting effect itself, validating the second hypothesis.

Non-performing loan negative relationship with ROE is confirmed by Frimpong (2010) and Ivashina (2010). This correlation is explained by accounting approach where all default loans are expensed directly in income statement report, therefore, it has direct negative impact on profit. Accordingly, banks with a higher non-performing loan would have 0.77% lower ROE per 1% increase in NPL, justifying the fourth hypothesis.

Bank size happens to be negative and statistically significant at 10% in multivariate regression (M7). However, in univariate regression result (M5), the correlation appeared to be positive yet insignificant. The main reason why the researcher examines size is the economies of scale and efficiency generated as banks grow bigger, the measurement proxy used is assets. However, as size grows larger over a certain point, diseconomies of scale arise (Naceur, 2008). Adusei (2015) and Kosmidou (2008) discovered a similar result of the negative relationship between bank size and profitability. Referring to this prior literature, unclear direction is suspected of embodying non-linear elements in-between the size and profitability. To verify this, a regression including square variable of size is done. The result does not confirm the existence of non-linearity relationship as the variable is found to be insignificant therefore there is not enough evidence to prove it. Overall, the result rejects the fifth hypothesis.

Even though some variables are not significant enough to prove the correlation, the direction of the relationship could be explained by literature. For instance, tax deductible in debt might be the explanation of the positive coefficient of DER to ROE. ROE is defined as profit divided by equity, and since debt financing does not increase the denominator, therefore, the same amount of profit would be split by smaller number compared to equity financing. Setiyaningsih et al, (2013) research also found a positive association between DER and profitability in Indonesia banking sector.

The insignificance of variable DER itself is suspected to be driven by the unclear relation in subsample period. Graph 1 represents the relationship between demean DER and ROE which is computed by averaging the result of each variable minus the mean in each year. This method allows assessing the within effect corresponding to fixed effect in regression (de Bandt, 2014). Based on the graph, both variables have a clear positive correlation in 2006 to 2009 and 2014 to 2015. The period in between shows a rather negative relationship which might be explained by different business environment. There is suspicion on this as it could also be a delay effect of financial crisis in 2008. However, specific investigation in respect to this is not executed.

Similar to DER, loan share also has a positive insignificant coefficient. This indicates the bigger portion of loan instruments implemented, the higher the likelihood of higher profitability achieved by firms, nonetheless since the variable is not significant, there is not enough evidence to prove the third hypothesis. This result will be continued later in section 4.3.

4.3 Separating Samples based on Assets

In descriptive statistics of the data, an unbalanced panel is observed mainly as skewness and kurtosis display fat tail with a right-skewed tendency in assets distribution. Including outliers may deviate the result as it is biased and the effect might be amplified if a significant disparity exists. To counter this problem, banks are divided into groups by assets size to control for size. To capture the effect over the years, the filtering process is done in the beginning year which is 2006. Big banks are banks with more than Rp75 billion while small banks have less. For the sake of consistency, the groups will consist of the same observations throughout the period. The same procedure of robustness check and regression is then carried out separately.

In Table 8, M8 and M9 present the regression result for both big and small banks. From the table, comparison of each variable impact on profitability can be observed. Negative equity accounting effect on ROE is 19% and 5% for small and big banks respectively. As for capital ratio and non-performing loan, the impact difference is rather negligible. Interestingly, loan share is now significant at 1% for big banks while it stays insignificant for the small one. Based on Graph 2, it is sensible as during the early period of 2006 to 2009. Loan share of small banks has clear contradicting direction while it is less clear for big banks. This means big banks have better capabilities in executing traditional banking activities which are proven to be more profitable by ICB on 2010. This is consistent with the argument by Allen et al (2010) of bigger banks have a higher demand for monitoring by its equity holder. Another interesting point, bank size is negatively significant at 10% for big banks while it is not the case for small banks. This result is supporting the existence of diseconomies of scale for banks whose assets have grown too big. However, the nonlinear relationship between size and ROE is not confirmed as a significant positive coefficient for small banks is not observed. The data is robust to multicollinearity and heteroscedasticity, but the result is not presented.

4. 4 Using Market Valuation as Proxy of Profitability

Applying ROE as the measurement of company's performance has the advantage of avoiding potential overvaluation bias arises from reverse causality in comparison with market data. To be specific, if a bank is overvalued, there is a high tendency where managers want to exploit the situation by issuing equity. This behavior is remarked as a reverse causality where market valuation affects capital ratio instead of the other way around (Baker et al, 2002). However, using historical value does not able to capture how the market value the company while market valuation offers a new perspective to see the present charter value by investors after placing weights on current potential growth, executors' history, a barrier to entry, etc., (Mehran et al., 2011). For this reason, the market valuation would be tested against other measurement variables as a substitute to ROE.

In equity market perspective, the abnormal return will be employed as a measure of profitability. The methodology to compute it would follow MacKinlay (1997). The model estimates the abnormal return at a given period with simple regression procedure. The normal return would be calculated based on the Jakarta Composite Index (JKSE) as the representative

of the market for stock exchange in Indonesia. The control period used is 150 days before the first day of each year.

In detail, the model is specified as below

$$\begin{aligned} (1) R_{i,t} &= \alpha_j + \beta_j R_{m,t} + \varepsilon_{jt} \\ (2) E(R_{i,t}) &= \hat{\alpha}_i + \beta_i R_{mt} \\ (3) Ar_{i,t} &= R_{i,t} - E(R_{i,t}) \end{aligned}$$

Where:

$R_{i,t}$: Return on security i on day t
$R_{m,t}$: Return on market index i on day t
$E(R_{i,t})$: Expected Return on security i on day t
$\hat{\alpha}_i$: Intercept of linear relationship between return of stock i and market return
β_i	: Slope determinant measured by sensitivity of stock i to the market
$Ar_{i,t}$: Abnormal return on security i on day t

Furthermore, several variables are adjusted to meet the adequate market-based model. First, debt to equity ratio is modified into leverage which is calculated as debt divided by debt plus equity following Berger's model (1995). Second, equity accounting effect is omitted since equity in market perspective is irrelevant with balance sheet value. Third, bank size is now derived from market capitalization, not assets anymore.

Then robustness check and fixed effect regression procedure are carried out. The full model is below,

$$CAR_{i,t} = \alpha_i + \theta_t + \beta_1 Capital Ratio_{i,t} + \beta_2 Loan Share_{i,t} + \beta_3 Non-Performing Loan_{i,t} + \beta_4 Leverage_{i,t} + \beta_5 Bank Size_{i,t} + \varepsilon$$

According to Table 9, capital ratio and leverage are significant at 90% confidence level while non-performing loan and bank size are at 95%. The capital ratio shows a contradicting negative correlation while leverage is still positively affecting cumulative abnormal return. This is in line with pecking order theory where profitable companies would prefer internally generated income or debt over equity. In investor's perspective, equity financing is perceived as an unfavorable signal because it is an expensive source of capital in the sense of transaction cost thereby profitable company will try to uphold lower capital ratio (Myers et al, 1984). Recent research by Hatem (2015) also found a similar correlation between capital ratio and leverage supporting the argument where leverage as a signal of firm's ability to repay them with future

cash flow. Additionally, equity holders have different treatment with debtors. When leverage increased, default probability increased accordingly yet depository insurance would guarantee depositors their fund's safety, therefore, no additional premium is demanded (O'Hara et al, 1990). Contradictory, it ensures nothing to equity holders consequently supplementary premium is required.

Both non-performing loan and size have negative interrelationship towards the cumulative abnormal return. Non-performing loan ratio describes how banks perform, and if this goes higher, charter values declined indicates default risk escalation (Keeley, 1990). One of the elements of investors' considerations in valuing stock is growth potential. Investors have the tendency to sell less prospective securities in their portfolio, initiating a negative price reaction to the related firms' stock. As the explanation for size, attention hypothesis by Barber and Odean (2008) stated that bigger capitalization attracts more analyst coverage leading to an efficient market where everything is incorporated to stock price instantly. The idea is there is a less efficient market for smaller caps due to the limited attention of analysts, therefore, higher degree of informational asymmetric is associated. The difference causes the negative affiliation between size and abnormal return.

Despite several variables' significance, it could not capture the real economic impact because some data is relatively incompatible when used against CAR. Abnormal return is a measure of market meanwhile debt and equity variables are based on book value. Comparing the r-square, the model only captures around 4.5% of the total variation while the model with ROE as the dependent variable could explain approximately 18% of the total variation. Furthermore, retrieving market value data of debt and equity are perplexing regarding on the availability.

5. CONCLUSION

This paper examines the influence of capital structure management in the banking industry to maximize profitability. Samples are taken from Indonesia public banks listed in Indonesia Stock Exchange (IDX) throughout 2006 to 2015. The majority part of the research purposely tries to explain the impact on book value based profit. However, adjustments are made to adequately model for market based fixed effect regression.

After disentangling for equity accounting effect, the study found that capital ratio positively corresponds to return on equity and negatively affecting abnormal return. This contradictory result shows different party's point of view. On bank's management side, higher capital ratio supports them expanding their market while investors perceive this as bad signals for the prospect of the bank. As for leverage proportion, a positive correlation is observed. This could be explained by either the tax-deductible regulation and risk point of view. Tax-deductible helps company loosen their interest burden, therefore, higher profit is realized, but as default risk increases, investors would demand an additional premium to compensate. Nevertheless, there is not enough evidence to prove this impact on return on equity.

Despite loan allocation on earning assets is expected to have a positive impact on profitability, significant evidence is found exclusively for big banks. One of the plausible explanation might be caused by the missing variable of interest rate. The interest rate charged on loan is the decisive part to explain the extent of profit it could yield. However, the data is not disclosed in either Bloomberg or Datastream. On the other edge, loan comprises credit risk which namely non-performing loan. As expected, the non-performing loan is negatively affecting bank performance. From an accounting point of view, this causes a direct expense in income statement thus lowering profit and accordingly, investors identify this as a decline in future prospect, therefore, they might reconsider holding banks' stock, especially the one with the higher percentage of the non-performing loan.

Bank size effect on profitability has been a debatable question over time. This research gives negative correlation evidence on Indonesian banking industry. Diseconomies of scale concept by Naceur and Goaid (2008) might be the best explanation in book value point of view. As for market-based, attention hypothesis by Barber and Odean perfectly clarifies this. The

suspicion on the probability of non-linear relationship is not found either using regression method.

Higher capital ratio produces capital buffer as a precaution of an unexpected unfavorable event. Nevertheless, debt offers tax deductibility which is cheaper than raising equity. By knowing the result of this study, bank managers could incorporate it into their capital structure decision-making approach to obtain the combination in maximizing profitability. With the addition of loan instrument, they should be aware more of the credit risk embodied with the loan as market disciplines punish reckless action, especially keeping track of on-going loan. Lastly, they also might aim to maximize shareholder value by considering how capital structure decision affects investors behavior.

The results and conclusions are evidence from Indonesian public banks from 2006 to 2015. Further research could be done in other emerging Asian market. As for methodology, other variables such as interest rates charged on loans by the banks could be included to picture the relationship better. More market-based focus evaluation will also be meaningful and engaging as market dynamic presents a definite advantage over the historical record.

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7. APPENDIX

Bank Name	
BANK ARTHA GRAHA INTERNASIONAL TBK PT	BANK NEGARA INDONESIA (PERSERO) TBK PT
BANK BUKOPIN TBK	BANK NUSANTARA PARAHYANGAN TBK PT
BANK BUMI ARTA TBK	BANK OCBC NISP TBK PT
BANK CAPITAL INDONESIA TBK PT	BANK OF INDIA INDONESIA TBK
BANK CENTRAL ASIA TBK PT	BANK PAN INDONESIA TBK PT
BANK CHINA CONSTRUCTION BANK INDONESIA T	BANK PEMBANGUNAN DAERAH BANTEN TBK PT
BANK CIMB NIAGA TBK PT	BANK PEMBANGUNAN DAERAH JAWA BARAT DAN B
BANK DANAMON INDONESIA TBK PT	BANK PERMATA TBK PT
BANK JTRUST INDONESIA TBK PT	BANK QNB INDONESIA TBK PT
BANK MANDIRI (PERSERO) TBK PT	BANK RAKYAT INDONESIA (PERSERO) TBK PT
BANK MAYAPADA INTERNASIONAL TBK PT	BANK SINARMAS TBK PT
BANK MAYBANK INDONESIA TBK PT	BANK TABUNGAN PENSIUNAN NASIONAL TBK PT
BANK MEGA TERBUKA	BANK VICTORIA INTERNATIONAL TBK PT
BANK MNC INTERNASIONAL TBK PT	BANK WOORI SAUDARA INDONESIA 1906 TBK PT

Table 1. Listed of banks included in the research

	ASSETS	DEBT	EQUITY	EARNING ASSETS	LOAN	ROE	NPL
Mean	96.055	7.204	11.089	85.063	65.962	0.106	1.465
Median	24.632	1.342	2.509	21.359	17.103	0.112	0.459
Maximum	905.229	111.773	117.163	804.344	620.372	0.359	19.229
Minimum	0.968	0.000	0.088	0.859	0.535	-0.868	0.000
Standard Deviation	161.607	14.288	20.033	142.653	110.891	0.148	2.528
Skewness	2.738	4.482	2.980	2.717	2.767	-3.512	3.247
Kurtosis	8.140	25.242	9.657	7.993	8.213	18.706	13.825
Observations	276	276	276	276	276	276	276

Table 2. Descriptive Statistics Table

AVERAGE THROUGH OUT THE PERIOD							
	ASSETS	DEBT	EQUITY	EARNING ASSETS	LOAN	ROE	NPL
2006	46.624	3.367	4.668	40.703	24.354	11.02%	1.515
2007	50.077	3.686	4.871	44.303	27.412	11.41%	1.216
2008	57.991	3.549	5.257	52.458	37.355	11.11%	1.197
2009	68.489	3.937	6.630	62.897	45.063	11.73%	1.324
2010	80.369	4.377	8.389	72.921	57.713	15.19%	1.221
2011	97.159	6.296	10.878	86.342	69.943	15.23%	1.260
2012	113.549	7.617	13.290	100.171	82.293	15.58%	1.251
2013	130.106	10.487	15.742	114.054	93.776	14.41%	1.434
2014	148.353	13.364	18.653	129.943	102.278	10.02%	1.933
2015	161.551	14.835	21.661	141.292	114.228	8.96%	2.702

Table 3. Average Value of Variables though out the Period Table

Note for Table 2 and 3:

The mean, median, modus, minimum, and maximum of all variables are stated in billions of Indonesian Rupiah (Rp), except for ROE. For market capitalizations, the observations are less than 276 because several data are not available in Bloomberg and Datastream.

GROWTH THROUGH OUT THE PERIOD							
YEARS	ASSETS	DEBT	EQUITY	EARNING ASSETS	LOAN	ROE	NPL
2007	7%	9%	4%	9%	13%	4%	-20%
2008	16%	-4%	8%	18%	36%	-15%	-2%
2009	18%	11%	26%	20%	21%	21%	11%
2010	17%	11%	27%	16%	28%	-1%	-8%
2011	21%	44%	30%	18%	21%	14%	3%
2012	17%	21%	22%	16%	18%	18%	-1%
2013	15%	38%	18%	14%	14%	-31%	15%
2014	14%	27%	18%	14%	9%	-29%	35%
2015	9%	11%	16%	9%	12%	-56%	19%

Table 4. Growth of Variables though out the Period Table

Variable	VIF	1/VIF
Equity Lagged Dummy	1.09	0.917431193
Debt to Equity Ratio	1.2	0.833333333
Capital Ratio	1.17	0.854700855
Loan Share	1.07	0.934579439
Non-Performing Loan	1.15	0.869565217
Firm Size	1.12	0.892857143
Mean VIF	1.13	

Table 5. VIF Test Result

Variable	M1	M2	M3	M4	M5
Equity Lagged Dummy	-0.1199836** (0.0568234)				
Capital Ratio		0.7225413*** (0.2296479)			
Loan Share			0.1367622 (0.1299852)		
Non-Performing Loan				-0.7663744*** (0.1057895)	
Bank Size					0.0070108 (0.0085232)
Constant	-0.0069253 (0.0535293)	0.1862346*** (0.0254686)	-0.0025179 (0.1032381)	0.1330372*** (0.003718)	-0.0622071 (0.2046201)

Table 6. Univariate Regression Result

(* , ** , *** represent statistical significant at 10%, 5%, and 1% respectively. Robust standard error is reported in brackets. Control variables are no included)

Variable	M6	M7
Equity Lagged Dummy	-0.1373891*** (0.0523385)	-0.1435425*** (0.0543108)
Debt to Equity Ratio		0.000853 (0.0085418)
Capital Ratio	0.7048824*** (0.1675269)	0.6311034*** (0.1428144)
Loan Share	0.0604576 (0.1022098)	0.1064299 (0.1138466)
Non-Performing Loan	-0.6848177 *** (0.0814982)	-0.7708068*** (0.11013)
Bank Size		-0.0212052* (0.0130558)
Constant	0.0309025 (0.0710954)	0.4919381** (0.2423839)
R-square	0.1800	0.1897
Observations	276	276

Table 7. Multivariate Regression Result with ROE as Dependent Variable

(* , ** , *** represent statistical significant at 10%, 5%, and 1% respectively. Robust standard error is reported in brackets. M6 is regression result excluding control variables while M7 result is already including control variables.)

Variable	M8	M9
Equity Lagged Dummy	-0.1959097*** (0.0718897)	-0.0528908*** (0.0168456)
Debt to Equity Ratio	-0.0024573 (0.0106732)	0.0119903 (0.0131599)
Capital Ratio	0.6082059*** (0.192072)	0.5885844*** (0.2979818)
Loan Share	0.0982053 (0.188979)	0.1216513*** (0.0395729)
Non-Performing Loan	-0.807358*** (0.1459961)	-0.8266166*** (0.2493625)
Bank Size	-0.0267848 (0.0200606)	-0.0171842* (0.0113788)
Constant	0.4951703 (0.3631972)	0.5337253* (0.2648394)
R-square	0.2097	0.2072
Observations	137	139

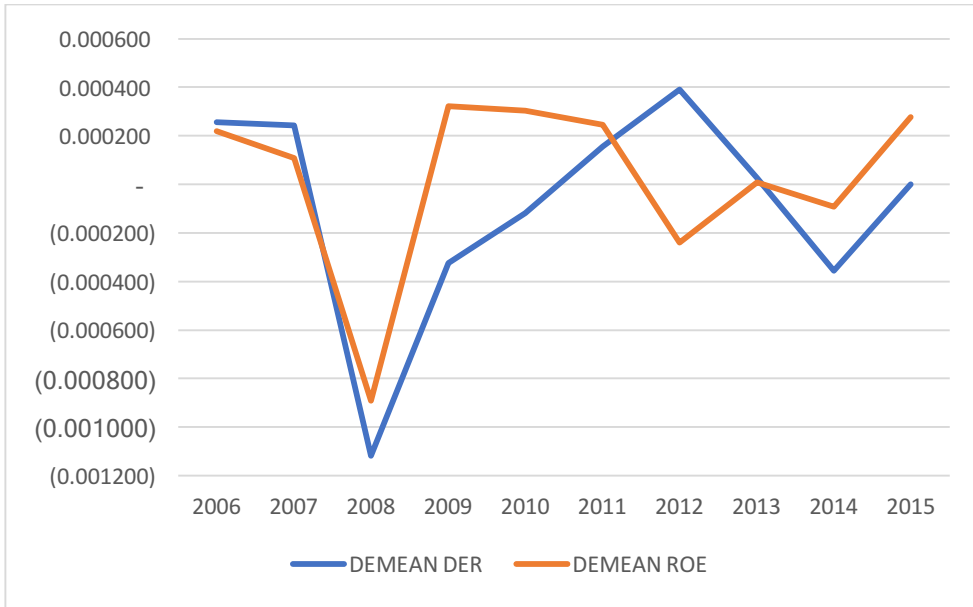
Table 8. Multivariate Regression Result with Separation of Big and Small Bank Sizes

(* , ** , *** represent statistical significant at 10%, 5%, and 1% respectively. Robust standard error is reported in brackets. M8 is regression result of small bank with total assets under Rp75 billion while M9 uses banks sample with assets over Rp75 billion.)

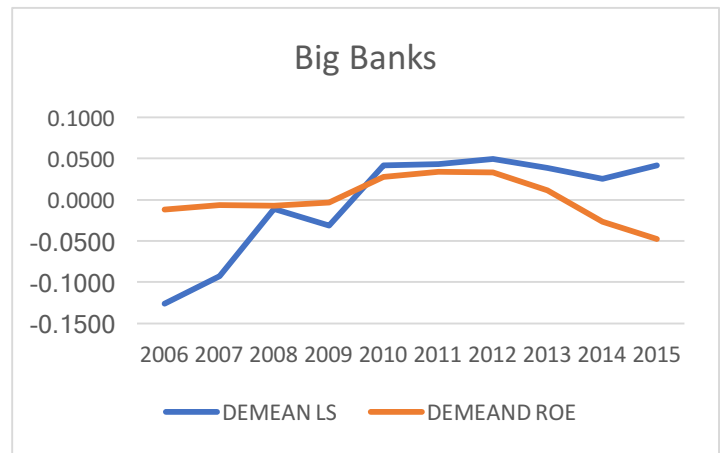
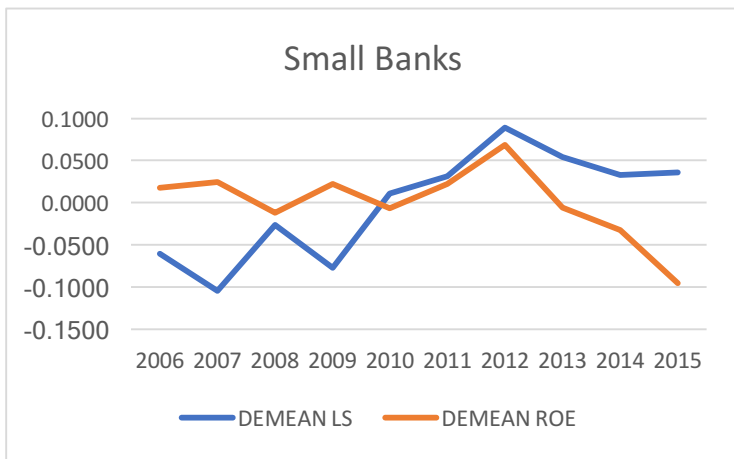
Variable	M10
Leverage	0.5679015* (0.1169507)
Capital Ratio	-0.8870412* (1.905017)
Loan Share	0.8673545 (0.6793261)
Non-Performing Loan	-1.262356** (0.6791341)
Bank Size	-0.182307** (0.0883032)
Constant	3.312474** (1.484901)
R-square	0.0453
Observations	235

Table 9. Multivariate Regression Result with Abnormal Return as Dependent Variable

(* , ** , *** represent statistical significant at 10%, 5%, and 1% respectively. Robust standard error is reported in brackets. All control variables are included.)



Graph 1. Demean DER and Demean ROE evolution between 2006 and 2015



Graph 2. Demean Loan Share and Demean ROE over times for Small and Big Banks