

Determinants Of Market Power Of Indonesia's Bank

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Abstract: This paper has objective to explore determinants of Market Power of Indonesian's Bank. This research has unit of analysis is listed bank of Indonesia Stock Exchange for period 2007 – 2018. This research use model panel data to estimate relationship market power with internal and external variable. This research found that Net Interest Margin, Non-Performing Loan, Capital Adequacy Ratio, Ratio Operational Expenses to Operational Revenue, Exchange rate, Economic Growth and Fed Rate significant affected bank market power. Size as moderating variable does not significant affect bank market power, but it could moderate Net Interest Margin, Non-Performing Loan, Capital Adequacy Ratio and Ratio Operational Expenses to Operational Revenue to bank market power.

Index Terms : Market Power, Non-Performing Loan (NPL), Net Interest Margin (NIM), third party fund, policy of interest rate, exchange rate, and Economic Growth.

1. INTRODUCTION

Based on data of Central Bank of Indonesia, number of bank dropped from 122 banks at the end of 2010 to 115 banks at the end of 2018. Credit that distributed by bank increased from IDR 1,765.84 trillion at the end of 2010 to IDR 5,358.01 trillion at the end of 2018. Third party fund also increased from IDR 2,338.82 at the end of 2010 to IDR 5,630.45 trillion at the end of 2018. This figure was expected to become higher in the future to show growth in banking sector in Indonesia. This indicator become huge discussion for academicians and bankers to seek factor of bank market power. Research in this area has been explored by academicians and bankers especially in developed market. Wang et.al [26] investigated Bank market power and SME finance for firm-bank in European countries. Cubilas and Suarez [7] explored bank market power after banking crisis. Fosu et.al [11] studied how does banking market power affect bank opacity based on analysts' forecasts. Mirzaei [19] explored Market power among UAE banks especially about The 2008 financial crisis and its impact. Cruz-Garcia et.al [9] explored The evolution of market power in European banking. Iveta [15] explored Market Power in the Czech Banking Sector. Soedarmono et.al [22] studied Bank Market Power, Economic Growth and Financial Stability in Asian Banks. Brissimis and Delis [5] investigated Bank-Level Estimates of Market Power. Fonseca et.al [10] studied how bank capital buffers vary across countries about the influence of cost of deposits, market power and bank regulation. Fungacova et.al [12] investigated Market Power in the Russian banking industry. De-Guevara et.al [8] studied Market Power in European Banking Sectors. Wolken and Rose [25] studied Dominant Banks, Market Power, and Out-of-Market Productive Capacity.

The above research mostly investigated internal factor and external factor especially macroeconomic in the country. The USA Federal Reserve decide a rate to become a policy rate in the developing countries like Indonesia. So this research included Fed Rate as independent variable.

The research in bank should consider type of bank or size of bank because this variable has significant to affect internal bank variable. This variable could be called as a moderating Variable. The moderating variable could be stated to strong or to weak relationship between dependent variable and independent variable (Manurung, [18], Muigai and Muriith [20]). Mahmood et.al [17] explored Moderating Effects of Firm Size and Leverage on the Working Capital Finance–Profitability Relationship: Evidence from China. Badara [3] studied the moderating effect of firm size on the relationship between Board Structure and Financial Performance of Deposit Money Bank in Nigeria. Based on previous explanation, this research want to explore effect internal and external variable to Market Power. Internal variable is Net Interest Margin (NIM), Non-performing Loan (NPL), Capital Adequacy Ratio (CAR), Ratio Operational Expenses to Operational Revenue (BOPO), Ratio Third Party Fund to Assets (TPF), Total Asset (Asset). External Variable is Exchange Rate (EX), Oil Price (OILP), Economic Growth (GRWT) and Fed Rate (FED). Then Total asset will put as moderating variable.

2. THEORETICAL REVIEW

Bank has business as intermediary from surplus units to deficit units. This business will result profit and fee to the bank. Some bank in Indonesia has fee based income that it could provide operational expenses. So Income from distributed loan that is called net interest margin (NIM). Profit of bank is as follows:

$$\pi = (1-T) * [(r+m) * L - r * \{(1-\alpha) * D + E\} + fb] \quad (1)$$

r = cost of capital ; m = expected margin
fb = net fee based ; α = reserve requirement
T = tax ; L = Loan ; D = deposits; E = equity

If equation (1) is arranged to be equation of Loan to Deposits ratio, it will be as follows:

$$\frac{\pi}{(1-T)} = (r+m) * L - r * TA + r\alpha D + fb \quad (2)$$

$$L = \frac{\pi}{(r+m) * (1+T)} + \frac{1}{(r+m)} [r * TA + r\alpha D + fb] \quad (3)$$

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$$\frac{L}{D} = \frac{\pi}{D * (r + m) * (1 - T)} + \frac{1}{(r + m)} \left[r * \frac{TA}{D} + r * \alpha + \frac{fb}{D} \right] \tag{4}$$

Based on the equation (4), Loan to Deposits is affected by ratio profit to deposits, leverage bank and cost of capital and ratio fee based to deposits.

3 METHODOLOGY

3.1. Model

Based on the previous explanation, this research want to explore internal and external factor to determine bank market power and there is size variable as moderating variable. The Model is as follows:

$$\begin{aligned} CMP_{i,t} = & a_0 + b_1 NPL_{i,t} + b_2 NIM_{i,t} + b_3 CAR_{i,t} + b_4 BOPO_{i,t} + b_5 TPF_{i,t} \\ & + b_6 Aset_{i,t} + b_7 EX_t + b_8 OILP_t + b_8 Growth_t + b_{10} Fed_t \\ & + b_{11} NPL_{i,t} * Aset_{i,t} + b_{12} NIM_{i,t} * Aset_{i,t} + b_{13} CAR_{i,t} * Aset_{i,t} \\ & + b_{14} LDR_{i,t} * Aset_{i,t} + b_{15} EX_t * Aset_{i,t} + b_{16} OILP_t * Aset_{i,t} \\ & + b_{17} Growth_t * Aset_{i,t} + b_{21} Fed_t * Aset_{i,t} + e_1 \dots \dots \tag{5} \end{aligned}$$

CMP = Credit by the bank / Total credit of all the bank

3.2. Estimation Model

This research use Model data Panel to estimate relationship some independent variable to determine bank market power as dependent variable. Model Data Panel is appropriate for data small which short time series and small company as sample. Besides that, model data panel also show time and the cross-section as sample. Gujarati [14], Wooldridge [24], Greene [13], Biorn [4] and Sul [23] stated model data panel is as follows:

a. Pooled Data Model

Pooled Data Model is model that data combine all together and the model is as follows:

$$Y_{i,t} = \beta_1 + \beta_2 X_{2i,t} + \beta_3 X_{3i,t} + \mu_{i,t} \tag{6}$$

$i = 1, 2, \dots, k ; t = 1, 2, \dots, n$
X's are non-stochastic and $E(\mu_{it}) \sim N(0, \sigma^2)$

b. Fixed Effect Model

FEM is a model that μ_i and X's are assumed correlated.

$$Y_{i,t} = \beta_{1i} + \beta_2 X_{1i,t} + \beta_3 X_{2i,t} + \mu_{i,t} \tag{7}$$

$i = 1, 2, \dots, k ; t = 1, 2, \dots, n$

c. Random Effect Model (REM)

REM is a model that ε_i and X's are assumed uncorrelated.

$$Y_{i,t} = \beta_{1i} + \beta_2 X_{1i,t} + \beta_3 X_{2i,t} + \mu_{i,t} \tag{8}$$

$\beta_{1i} = \beta_1 + \varepsilon_i$
 $i = 1, 2, \dots, k ; t = 1, 2, \dots, n$

μ_i is a random error with a mean value of zero and variance of σ_ε^2 .

Judge [16], Wooldridge [24], Biorn [4] and Sul [23] stated that how we choose FEM or REM as follows:

1. When T (number of time series data) is large and N (the number of cross-sectional units) is small, FEM may be preferable.
2. When N is large and T is small, if we strongly believe that the individual, or cross-sectional, units in our sample are not random drawings from a larger sample, FEM is appropriate. If the cross-sectional units in the sample are regarded as random drawings, the REM is appropriate.
3. When individual error component ε_i and one or more regressors are correlated, FEM is an unbiased estimator.
4. REM estimators are more efficient than FEM Estimators, when N is large and T is small and if the assumptions underlying REM hold.

3.3. Data

Data for this research was collected from the company that they published to public in newspaper or their website as mandatory requirement from government and Indonesia Stock Exchange, but macroeconomics data is obtained from Central Bank of Indonesia . Data is annually data that collected for period of 2007 to 2018, that only twenty four companies have financial statement for the period. Then, Market Power (Y), Net Interest Margin (NIM), Non-performing Loan (NPL), Capital Adequacy Ratio (CAR), Loan to Deposits Ratio (LDR), Ratio Operational Expenses to Operational Revenue (BOPO), Ratio Third Party Fund to Assets (TPFA), Total Asset (Asset) and Exchange Rate (EX), Oil Price (OILP), Economic Growth (Growth) and Fed Rate (FED) are calculated that is based data collection. Data Exchange Rate, OIL Price, Total Asset are transformed to logarithm natural, when model run by Eviews.

4 DATA ANALYSIS

Research Analysis will divide into two group such as Descriptive and the determinant market power of bank. Firstly, Descriptive Analysis will explain and follow by explaining of bank market power.

4.1. Descriptive Analysis

This descriptive analysis will explain behavior of unit analysis using statistics that it show at Table 1 below.

Table 1: Descriptive Statistics of Research

	CMP	SMP	NIM	NPL	CAR	LDR	BOPO	TPFA	Asset	EX	OILP	FED Rate	Growth	Economic
Minimum	0.04%	0.04%	1.12%	0.00%	9.9%	0.65%	33.28%	51.94%	1,168.00	8,996.00	37.04	0.5%	4.63%	
Maximum	15.85%	17.30%	14.00%	8.90%	52.7%	145.26%	180.62%	186.36%	1,296,898.00	14,390.00	98.56	5.3%	6.49%	
Median	1.28%	1.02%	5.19%	1.50%	17.3%	83.85%	84.36%	79.10%	46,977.41	11,544.37	69.25	0.5%	5.48%	
Average	2.95%	2.85%	5.74%	1.78%	18.6%	80.74%	84.02%	77.55%	39,580.33	11,274.83	66.48	1.6%	5.56%	
STDEV	4.08%	4.30%	2.40%	1.37%	6.2%	15.88%	14.80%	11.63%	5.91	1.20	1.43	1.9%	0.69%	
Skewness	1.67	1.92	1.24	1.38	2.27	-0.87	1.51	3.83	0.95	0.98	0.74	1.31	0.035	
Kurtosis	1.70	2.54	1.49	2.85	8.00	4.95	9.00	34.36	0.37	0.15	0.21	-0.24	-1.84	
Jarque Berra	154.761	178.81743	101.3724	91.54814	547.8131	82.16136	540.9787	12505.03	126.4258648	144.03247	120.2587	208.327385	281.2925	
Sumber: Processing by Researcher														

Average of Credit Market Power (CMP) of all bank is 2.495% p.a and maximum of 15.85% and standard of deviation is 4.08%. These figure look small for average and standard of deviation, but the variation is to high. Average of Saving Market Power (SMP) of all bank is 2.85% and it has higher standard deviation of 4.30% compared to CMP. The average of CMP and SMP is look like similar but CMP is higher than SMP but it's standard of deviation, CMP les than SMP. Net interest margin (NIM) of bank has average of 5.74% and the maximum of 14% and standard of deviation of 2.4%. This NIM is highest than previous research, but fluctuation among bank is quite different and small. This data also show that banks have high competition in the market. Non-performance Loan (NPL) has average 1.78% and the maximum of 8.9% and standard of deviation of 2.14%. Mostly bank has to maintain NPL around 2% because it required Central Bank. Capital Adequacy Ratio (CAR) has average 18,6 and the maximum of 52.7% and standard of deviation of 6.2%. This ratio look good for bank because the figure is above the regulation requirement. Bank should maintain this figure to get better operational and to fulfil regulation. Loan to Deposits Ratio (LDR) has average of 80.74% and standard of deviation of 15.88%. This figure reflected fluctuation LDR of Bank. Bank should maintain this figure around 85% from total third party fund, because bank need money to operate treasury department and investment to zero risk instrument such as government Bonds and also reserve requirement as required by central bank. Ratio Operational Expenses to Operational Revenue has average of 84.02% and the maximum of 180,62% and Standard of Deviation of 14.8%. This ratio has high fluctuation because there is a high value for a company. Third Party fund as ratio to Total Asset has average 77.55% and standard of deviation of 11.63%. This figure also represented the fluctuation quite similar to all bank. Asset of the bank has average of IDR 1,168 trillion and standard of deviation of 5.91%. This figure show that there is to many small bank, even there is some bank that has highest asset, sometimes they called to book-4 as classified by central bank. The highest asset of bank is IDR 1,297 trillion as shows in Table 1. As mentioned before, this research also included macroeconomic variables to affect bank market power. Exchange rate has average of IDR 11,275, maximum of IDR 14,390 and standard of deviation of 1.20. This figure show that exchange rate does not fluctuate very high. Mostly fluctuation exchange rate is not more than 5% p.a. but it some time could be more than 5%. Oil Price has average of US\$ 66.48 per barrel and the maximum proce of US\$ 98.56 per barrel and standard deviation of 1.43. It means that the fluctuation is small. Economic Growth has average of 51,273.94 ton per year and standard of deviation of 1.28. The fluctuation of economic growth is to small because there is factor internal including local political factor to affect the economic growth more higher. Fed Rate has average of 1.6% and standard of deviation of 1.9%. This figure show that US maintain the rate to push economic to become better. This research are mostly support business operation the bank in Indonesia. The bank always follow the rule issued by central bank. This research also support about indicator of banking market power.

4.2. Determinant Market Power

This research want to explore determinant of bank market power in Indonesia for period of 2007 to 2018. Market power

will be always stated by two variable such as ratio loan of bank to total loan of bank and ratio third party fund of bank and total third party fund in Indonesia. Then, this research test differences of average of ratio loan of bank to total loan of bank and ratio third party fund of bank and total third party fund in Indonesia. This test use t-test or p-value (Gujarati, 2003). The result is that T_{ob} is less than T_{Table} or p-value greater than level of significant of 5%, so it stated that there is no difference two ratio. So we can only use one ratio among them. This paper decide to use ratio loan of bank to total loan of bank in Indonesia. Model 9 present determinant bank market power in Indonesia. This paper use internal factor and external factor. Internal factor use in this paper such as Net Interest Margin (NIM), Non-performing Loan (NPL), Capital Adequacy Ratio (CAR), ratio operational expenses to operational revenue (BOPO), ratio Third Party Fund to Asset (TPF), and Asset. But Variable Asset will put to become moderating variable in this research. Net Interest Margin (NIM) has significantly affect bank market power at level of significant of 5%. Non-performing Loan (NPL) has significantly affect bank market power at level of significant of 5%. Capital Adequacy Ratio (CAR) has significantly affect bank market power at level of significant of 1%. Ratio operational expenses to operational revenue (BOPO) has significantly affect bank market power at level of significant of 15%. Ratio Third Party Fund to Asset (TPF) does not has significantly affect bank market power at level of significant of 5%, and Asset does not affect bank market power at level of significant of 5%.

$$\begin{aligned}
 MP_{i,t} = & 0,115 - 0,128 NIM_{i,t} + 0,182 NPL_{i,t} + 0,046 CAR_{i,t} + 0,0133 BOPO_{i,t} \\
 & (0,012) \quad (0,0173) \quad (0,007) \\
 & (0,147) \\
 & - 0,0104 TPF_{i,t} - 0,0004 ASET_{i,t} - 0,016 EX_{i,t} + 0,250 \\
 & GRT_{i,t} + 0,134 FED_{i,t} \\
 & (0,506) \quad (0,974) \quad (0,097) \quad (0,149) \\
 & (0,018) \\
 & - 0,0024 OILP_{i,t} + 0,0134 (NIM*ASET)_{i,t} - 0,022 \\
 & (NPL*ASET)_{i,t} \\
 & (0,547) \quad (0,012) \quad (0,006) \\
 & - 0,006 (CAR*ASET)_{i,t} - 0,001 (BOPO*ASET)_{i,t} + 0,001 \\
 & (TPF*ASET)_{i,t} \\
 & (0,002) \quad (0,138) \quad (0,487) \\
 & + 0,0007 (EX*ASET)_{i,t} - 0,018 (GRT*ASET)_{i,t} - 0,006 \\
 & (FED*ASET)_{i,t} \\
 & (0,439) \quad (0,299) \quad (0,267) \\
 & + 0,0001 (OILP*ASET)_{i,t} \\
 & (9) \\
 & (0,757)
 \end{aligned}$$

$R^2 = 99,07\%$; $F_{test} = 424.97$ P-value is on bracket

The external factor become research variable such as Exchange rate, Economic growth, Oil Price and Fed Rate. Exchange Rate significantly affect bank market power at level of significant of 10%. Economic Growth significantly affect bank market power at level of significant of 15% and Fed Rate significantly affect bank market power at level of significant of 10%. Oil Price does not affect bank market power. Exchange rate have negative impact to bank market power. It means that Increasing or decreasing exchange rate will affect decreasing or increasing bank market power. Economic growth and Fed Rate have positively impact to bank market power. Exchange

rate and Economic growth have sign as expected (theory). But, Fed Rate have opposite sign with the theory, that it should be negative sign. This research has found many results and support previous study that has been done such as Adeabah et.al [1], Afanasyeva [2], Basimis and Delis [5], Fosu [11], Iveta [15], Mirzae [19] and Ryan [21].

5 CONCLUSION

This research has conclusions based previously explanation as follows:

1. This research found that fluctuation of each ratio has high fluctuation because all big bank include in the sample.
2. In the internal ratio variable, Interest Margin, Non-Performing Loan, Capital Adequacy Ratio, Ratio Operational Expenses to Operational Revenue significant affected bank market power
3. In the external variable, Exchange rate, Economic Growth and Fed Rate significant affected bank market power.
4. Size as moderating variable does not significant affected bank market power, but it could moderate Net Interest Margin, Non-Performing Loan, Capital Adequacy Ratio and Ratio Operational Expenses to Operational Revenue to bank market power.

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