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**BANK-SPECIFIC AND INDUSTRY-CHARACTERISTIC  
DETERMINANTS OF COMMERCIAL BANK PROFITABILITY:  
EMPIRICAL STUDY FOR INDONESIA**

**Abstract:**

This study discusses the influence of a series of bank-specific factors such as CAR (Capital Adequacy Ratio), OEIO (Operations Expenses to Operations Income), NPL (Non Performing Loan), and FBI (Fee-based Income) on ROA as a profitability proxy. Also studied whether commercial banks probability affected by the concentration (Structure Conduct Performance, SCP) or efficiency (Efficiency Hypothesis, HE). Share of Third Party Funds (STPF) is variable proxy of SCP, while the OEIO proxy of HE. By using panel data procedures of the 111 commercial banks during 2005 to 2011, this research concludes that CAR and FBI have significant effect with positive sign on ROA, while OEIO and NPL significant with negative sign. STPF does not significantly affect on ROA so SCP theory as a proxy for the concentration is rejected, on the other hand, this research accepts the HE theory that focuses on the efficiency.

**Keywords:**

profitability; structure conduct performance; efficiency hypothesis

**JEL Classification:** E50

## Background

The role of the banking sector in Indonesia relates with its share on the Gross Domestic Product (GDP) and financial sector assets. In the period of 2004 to 2013, the banking sector contributed an average of 2.88% of GDP (Central Bureau of Statistics, 2013). The assets of the banking sector (commercial banks and rural banks) donated about 79.5% of financial sector assets (Bank Indonesia, 2014).

During 2005 to 2012, the average ROA of commercial banks in Indonesia was over 2.33% per annum. In the same period, asset and profit were increased an average 17.56% and 21.52 % (Financial Services Authority, 2014). If it compares with banking sector in counterpart, the level of Indonesia's ROA was relatively high. Banking ROA of South Korea, Australia, Singapore, Japan, Hong Kong, and Thailand were below 1.5% in 2012.

Bank runs business to maximize profit like as another company. Banks must be profitable for survival reason and business expansion in order to increase economic of scale (Simorangkir, 2000). In addition, profit is a measurement of both internal and external bank's performance.

For internal, profit determines the performance of management in managing earning assets. Externally, profit becomes the indicator of business attractiveness, business sustainability and business stability. Furthermore, profit also is a measure of bank's soundness for banking regulator.

The research of bank profitability includes two factors. The first factors are the internal factors that have a link with the specific characteristics of bank. They usually state on balance sheet and income statement (Ramlall, 2009). Those factors directly result of the management policy (Athanasoglou *et al*, 2008). Meanwhile, the external factors connect the characteristics of the market/industry and macroeconomic environment.

Two objects of this study are: (i) determine the effect of bank specific factors on profitability and (ii) determine whether commercial banks profitability was influenced by a concentrated market structure (SCP) or efficiency (HE).

## Related Theory

Capital has a positive effect on the banks' profitability (Havrylchuk and Emilia, 2006). In the long term, capital supports business of bank and it also resolve agency problems. The strong capital allows banks to manage operational activity better, especially to monitor the borrower. Beside of that, capital acts as indicator of bank's ability to guarantee depositor funds when the condition deteriorate. Furthermore, capital also determines bank's power to catch business opportunities. (Frankin *et al*, 2011).

However, the increasing of capital is costly for banks because it will reduce liquidity for investing in some of earning assets and it influences the declining of bank's profit. In the term of safety, the increasing of capital may reduce the opportunity of liquidity problem. Capital became a source of payment for depositors when the banks are bankrupt (trade -off theory) [Myres, 1984].

The analysis of bank efficiency refers to the theory of production because it is the center of the operating costs (Mester, 1987). Sealey and Lindley (1977) concerned three components of production cost of bank: labor input (L), physical capital (K), and

deposits (D). Output consists of loans (LO) and Other Earning Assets (OEA). The production function of financial institutions is:

$$LO + OEA = \min [D (L, K); LO (L, K) + OEA (L, K)] \quad [1]$$

$$D (L, K) = LO (L, K) + OEA (L, K) \quad [2]$$

$$C = C_{LO} (LO, W_L, W_K, W_D) + C_{OEA} (OEA, W_L, W_K, W_D) + C_D (LO + OEA, W_L, W_K, W_D) \quad [3]$$

Input cost (C) is total of the cost of labor (WL); cost of physical capital (WK) and cost of deposits (WD). In term of maximize profit, bank should minimize cost of production (C) (Turati, 2003). The equation 3 is cost frontier that illustrates the minimal cost to produce LO and OEA. By assuming constant transaction costs, the bank is inefficient if costs to produce LO and OEA are above equation 3.

NPL is measure of bank's risk in term of credit. The relationship between NPL and bank's profitability is negative that have been concluded by several studies, including Poghosyan and Hesse (2009) and Miller and Noulas (1997). High NPL became the indicator of high risk to invest. In this situation, banks tend to be risk averse by reducing their credit. Declining of credit will be impact on bank profitability through interest rate revenue. Bank will pay more attention on thriving of NPL in the crisis because it may influence the whole bank indicator performance.

The movement of bank from traditional business (especially in credit) to non-traditional business soars in the last two decades. Nowadays, bank does not only focus on colleting revenue from interest rate but also looking the opportunity from non-interest rate revenue, such as service. The sources of revenue from non-interest rate are named fee-based income, for example, revenue from bank's guarantee, letter of credit scheme, foreign reserve transaction and corporate.

Research of Hadad *et al* (2004) addressed the role of FBI on foreign banks in Indonesia. Foreign banks have advanced in technology information that contributes to deliver the ability serve excellence. Simultaneously, foreign banks also have some branch offices outside their home country, so it helps them to increase fee-based income revenue. Pompong (2010) studied the influence of interest rate spreads, FBI, and Loan to Deposit Ratio (LDR) on ROA, involved three groups of bank (state banks, private national banks, and foreign banks). The finding of that research stated that the profitability of state banks and private national banks were respectively triggered by interest rate spreads and LDR. By contrast, in foreign banks, profitability was contributed by FBI.

The second research question of this study related to Indonesia's banking industry history, broadly when appearing of Package October 1988. The aim of this package is to increase the private sector involvement in state financing that was resulted by declining of government's revenue from oil and gas. At that time Indonesian government changed the regulation about minimum capital requirements to established a bank and it was impacted on the number of bank in Indonesia, mainly private bank and new joint venture (Mulyaningsih and Daly, 2011). Notwithstanding, the hiking of the population of did not give significant progress on economy performance, whereas it made a turmoil because of poor corporate governance, both from internal and external of the bank.

The monetary crisis in 1997/98 have changed Indonesia's banking sector fundamentally. Moreover, the crisis has forced government to close 16 banks in Indonesia and recommended some banks to merger in order to fulfill capital requirement. In 2004, Bank Indonesia formulated an Indonesian Banking Architecture

(API) that directly affects the number of banks. API is absolutely contrasts with Policy Package October 1988. API was made to strengthen the structure of the banking industry by reducing the number of banks.

By reducing a number of banks, API may be impact on concentration in the banking industry and lead to unfair competition. This is because of the regulation in API forces bank to deal with minimum capital requirement and the single presence policy. Those regulations will direct some of banks to merger or acquisition.

### Previous Research

Several studies related to bank profitability have been carried out by previous researches. Athanasoglou *et al* (2006), for instance, concentrated to study "Determinants of Bank Profitability in the South Eastern European Region". Writer used panel data to obtain the research finding.

$$\pi_{it} = c + \sum_{j=1}^J \beta_j X_{it}^j + \sum_{l=1}^L \beta_l X_{it}^l + \sum_{m=1}^M \beta_m X_{it}^m + \varepsilon_{it}, \quad \varepsilon_{it} = v_i + u_{it}$$

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$\pi_{it}$  = bank profitability;

$X_{it}^j$  = group specific bank;  $X_{it}^l$  group specific industry; and  $X_{it}^m$  makroecommic factors

For group of specific bank, this study noted that the capital, credit risk, productivity, and management expenditures have significant effect on bank profitability whereas the size of the bank has not. Ownership and concentration variables as indicator of the SPC hypothesis has no significant effect on the profitability of banks that indicator the group of specific industry. The macroeconomic variables, such as inflation expectations and cyclical output have significant effect on the profitability of banks during the study period.

Ramlall (2009) also did the same research for case study in Taiwanese. Ramlall analyzed of Bank-Specific, Industry-Specific and Macroeconomic Determinants of Profitability in Taiwanese Banking System: Under Panel Data. The models of that study are:

$$\text{Profitability}_{it} = \beta_0 + \beta_1 \text{Efficiency}_{it} + \beta_2 \text{Capital}_{it} + \beta_3 \text{Size}_{it} + \beta_4 \text{Credit Risk}_{it} + \beta_5 \text{HHI-Deposit}_{it} + \beta_6 \text{HHI-Credit}_{it} + \beta_7 \text{HHI-Assets}_{it} + \beta_8 \text{Cyclical Output}_{it} + \beta_9 \text{Economic Development}_{it} + \beta_{10} \text{Interest Rate}_{it} + \beta_{11} \text{Stock Market}_{it} + \varepsilon_{it}.$$

On his study, Ramlall eliminates some of the independent variables because of a correlation among independent variables. The conclusion is that credit risk has significant effect with the negative sign on bank's profitability while bank capital has positive effect. This study examined *Herfindahl Hirschman Index* (HHI) of deposit, credit, and asset as independent variables. Three variables of HHI, that captured concentration degree on industry, have no significant effect on bank's profitability.

Studied about banking profitability was also conducted by Deger and Anbar (2011), with the title: "Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey". They used panel data techniques on producing the research result. The model used on that research is:

$$\text{Profitability} = f(\text{bank -specific, macroeconomic determinants})$$

The dependent variable of ROA and ROE. Bank-specific variables consist of asset size (logA), capital adequacy (CA), asset quality consist of two measure: (LA) and under follow-up loans (net) to total assets (LFA), liquidity (LQD), deposits (DP) and the income-expenditure structure (Net Interest Margin, NIM and Non-Interest Income, NII). Macroeconomic variables consist of GDP growth, inflation (INF) and real interest rate (RI). The research conclusions showed that several variables effected on bank profitability in Turkey were LogA bank (1%); LA (5%); LFA (5%); NII (10%). Whereas other variables did not significantly influence the profitability of banks in Turkey.

## The Approach of Industry Characteristics

Two main variables on the characteristics of the market/industry that affect the bank's profitability are concentration and competition. In attempt to explain it refers to two approaches: the structural and non-structural approaches.

### a. Structural approach

The prominent model for competition in industry refers to Structure-Conduct-Performance/SCP. This approach believes a linear relation among market structure, conduct and performance. Thus, market performance can be indicated by the structure occurred. This approach explains that fewer number of company lead to more concentrated market structure and contributes to unfair competition behaviors (collusive).

Several studies have articulated that unfair behaviors in industry was impacted by the ability of company to sell their product above Marginal Cost ( $P > MC$ ). By selling their product above MC, it shows that the company has market power in industry (Church and Ware (2000; within Lubis, 2012; Yeyati and Micco, 2003)<sup>1</sup>. The market power of a firm will be higher if the market is more concentrated. High market power indicates a low level of competition.

### b. Non- Structural Approaches

The SCP framework about linier relation among market structure, conduct, and performance is less the line within the develop industry environment. The direct relation of these three factors was no longer one direction but bidirectional. Nowadays, the performance of industry can influence corporate behavior and behavior of firms can affect market structure (Martin, 2008).

The focus of efficiency hypothesis is not on market share and concentration (indicator of market power) but efficiency. The high concentration in industry is not form of collusion but shows the company ability to improve efficiency. Efficient company tends to achieve high performance and increases its market share in the industry (Ariyanto, 2004). Thereby, the structure of the market does not always affect performance.

HE conclusions about the relationship of among market structure, conduct, performance, are: (i) high profits is not a reflection of poor market performance, (ii) high price is not a term to get maximum profit because bank have to concern on

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<sup>1</sup> A firm in a perfectly competitive market does not have market power ( $CR = 0$ ). Market power of monopolistic competition depends on the strength of product differentiation. Market power in the oligopoly depends on cooperation between actors in the industry. Market power in the monopoly market is the highest than other types ( $CR = 1$ ).

company efficiency, and (iii) efficiency becomes a barrier to entry for the new firms.

## Research Model

The specifications of the model this study is:

$$ROA_{it} = \alpha_0 + \beta_1 CAR_{it} + \beta_2 OEIO_{it} + \beta_3 NPL_{it} + \beta_4 FBI_{it} + \beta_5 SA_{it} + \beta_6 STPF_{it} + \beta_7 SC_{it} + \varepsilon_{it}$$

ROA <sub>it</sub>	=	Return on Asset of individual bank (%)
CAR <sub>it</sub>	=	Capital Adequacy Ratio of individual bank (%)
OEIO <sub>it</sub>	=	Operations Expenses to Operations Income of individual bank (%)
NPL <sub>it</sub>	=	Non Performing Loan of individual bank (%)
FBI <sub>it</sub>	=	Fee Based Income of individual bank (%)
SA <sub>it</sub>	=	Share of asset individual bank to banking industry (%)
STPF <sub>it</sub>	=	Share of third party funds individual bank to industrial banking (%)
SC <sub>it</sub>	=	Share of credit individual bank to industrial banking (%)
ε <sub>it</sub>	=	Residual values

## Results and Analysis

The first model estimation result showed the problem of multicollinearity between SA and SC. By omitting these two variables, the research used five independent variables. They are NPL, CAR, ROA, FBI, and STPF. The research findings are: CAR and FBI has a positive effect on ROA, whereas OEIO and NPL have a negative effect (critical value 5%). Variable STPF was no significantly effect on ROA. The result model of this study is:

$$ROA_{it} = 7,91645 + 0,0085CAR_{it} - 0,0698OEIO_{it} - 0,032NPL_{it} - 0,0001\beta_4FBI_{it} - 0,0028STPF_{it}$$

**Table 4.2 Partial Test Results**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.916451	0.238029	33.25829	0.0000
CAR?	0.008568	0.003268	2.621735	0.0089
NPL?	-0.032632	0.012184	-2.678200	0.0076
OEIO?	-0.069869	0.002868	-24.35736	0.0000
STPF?	-0.002838	0.003653	-0.776759	0.4376
FBI?	0.000181	8.67E-05	2.084047	0.0375
Weighted Statistics				
R-squared	0.923372	Mean dependent var	5.212702	
Adjusted R-squared	0.910040	S.D. dependent var	4.541303	
S.E. of regression	1.066396	Sum squared resid	751.6894	
F-statistic	69.26131	Durbin-Watson stat	1.850023	
Prob (F-statistic)	0.000000			

Source: Eviews 6.0

Based on output, this study concludes that OEIO has significant effect on ROA, reversly, where STPF has not significant effect on ROA. It means HE theory is

accepted that means ROA of commercial bank in Indonesia was influenced by the efficiency of bank, and it was not affected concentration.<sup>2</sup>

The calculation for final intercept (individual + intercept) showed that Regional Government Bank (BPD19) and Non-Foreign Private National Bank (BUSNND16) were the highest and the lowest intercept from 111 samples. BPD19 achieved around 10.38099 and BUSNND16 was 5.529454. In attempt to serve a well explanation, the condition of both banks will be clarified below.

### **Regional Government Bank (BPD19)**

Some of the factors that trigger of high ROA BPD19's (5 % and 7.5 %) are: *First*, CAR maintained in the range of 20% to 58.46%. *Second*, OEI stood relatively low, below 65% (except in 2008 79.49% that influenced by the global financial crisis). *Third*, NPL were low and it was below banking regulation. In 2011, NPL was only 2.24%. *Fourth*, FBI tends to increase. In average, the FBI grew about 187.78% per year during 2005 to 2011. *Fifth*, the yearly average of Net Interest Margin (NIM) during the 2005 to 2011 was 11.25%. BPD19 placed at tenth highest NIM for the entire samples.

*Sixth*, BPD19 was been supported by a well liquidity management. In the period of 2005 to 2011, the third party funds jumped an average of 31.80% per year, while lending was hike an average of 29.59 % per year. *Seventh*, deposits were dominated by low cost funds. In 2011, demand deposits and savings contributed around 69.74% of total deposits. *Eighth*, the profit before tax grew faster than assets. In the period of 2005-2011, the bank assets grew in average for only 25.60% per year, while the average profit growth 33.63% per year.

### **Non-Foreign Private National Bank (BUSNND16)**

Some of the factors that lead to poor performance of BUSNND16 are: *first*, the ratio of capital to ATMR was very high that in average reached 938.11% per year during 2005-2011 and showed a massive liquidity not performed. *Second*, bank was inefficient that was proven by the average OEI was 97.21% per year during 2005-2011. In 2005 and 2007, OEIO ratio hit 145.02% and 141.11%. *Third*, FBI was very low when it compared to other bank that have the same size. In 2005 to 2011, FBI was roughly IDR110.71 million and it tended to decline.

*Fourth*, the accumulation of third party funds individual as input of producing loans and other earning assets was relatively low, at only 0.01% of third party funds of banking industry. *Fifth*, the poor liquidity management that was captured from the realization of loans over the accumulation of third party funds (LDR term). In 2005, for instance, LDR reached 761.42%. *Sixth*, the structure of the deposits was supported by an expensive source of funds. The share of time deposits in 2011 peaked 62.40%.

This study also serves a deep explanation of relationship between ROA and its independent variable as mentioned below. To begin with, this part will depict summary of ROA and CAR then it will be continued by another independent variables.

### **ROA and CAR**

<sup>2</sup> This argument was also confirmed by the calculation of HHI. During 2005 to 2011, HHI assets, deposits, and loans were below 1,800. In 2011, HHI assets was 620.44; HHI deposits and HHI loans were 703.67 and 606.89, respectively.

During the period of research, the capital structure of banks became stronger, which was reflected by the increasing of share Tier 1 to total capital. From 111 of samples, 95% of them had increased the contribution of Tier 1 to total capital. In average, the share of Tier 1 to total capital was above 90%. In 2005, the share of Tier 1 to total capital was merely 85.08% and jumped to 91.24% in 2011.

In the international level, warning of strengthening on bank capital has been accommodated in Basel III. The capital and liquidity framework mentioned in the Basel III set gradually, that started at January 2013 and will be fully implemented by January 2019. Several differences between Basel III and Basel II are (i) an appearing of a capital conservation buffer for about 2.5% (set on normal conditions). If bank experience a crisis, this fund can be used to absorb the losses; (ii) countercyclical capital buffers reached 0% to 2.5% of common equity or capital that reserved specifically to absorb losses of the business cycle; (iii) a leverage ratio as an additional measurement to complement the minimum capital adequacy. The calculations are based on the ratio between the high quality capital divided by the total exposure (on and off-balance sheet); and (iv) strengthening liquidity management (Bank Indonesia, 2012).

## **OEOI and ROA**

To determine the efficiency of banks in Indonesia, this study digs information about three components of efficiency. They are input deposits, interest rate expenses, and labor cost expenses. *First*, input deposit (demand, savings, and time deposits) of 111 samples were still dominated by an expensive funds, mainly from time deposits. Non-foreign private national bank, for instance, was supported by above of 45% fund from time deposits.

*Second*, share of interest expense to total expense. Around 73 of the 111 samples have had a ratio of interest rate expense to total expense was above the sample average (41.30%). For five groups of banks, foreign bank has the lowest ratio for this measurement was only 11.91% while the highest was non-foreign private national bank, reached 22.62%. The bright ratio of foreign banks connected with their third party funds structure that was dominated by low cost funds. In 2011, share of low cost funds hit 62.35% to total deposit where demand and savings contributed 43.39% and 12.96%.

*Third*, labor expenses to total operational expenses. This ratio for whole samples was 19.28%. The highest ratio reached 24.91% in regional government bank then followed non-foreign private national bank was 22.62% and government bank was 20.45%. This efficient indicator for joints banks and foreign banks were only 16.19% and 11.91%.

## **NPL and ROA**

In 2011, five banks have NPLs above 5 percent. These banks are BUSNND1, BA10, BPD21, BUSND13, and BA3. To reduce NPL, bank should concerns to internal and external situation. The internal situation, for instance, is the real sector risk, and government policy. While for external side bank have to analyze the current situation of global economy such as financial crisis, energy crisis, and debt crisis. Bank also ought to analyze credit concentration: sector, regional, and currency. In term of currency, NPL will be higher when the local currency is depreciated. In Indonesia



case, share of credit on US dollar to all credit have been decreased, from 18.66% in 2005 became 15.92% in 2012.

## FBI and ROA

The role of FBI revenue to total bank revenue has been increased since 2005. In 2005, FBI was merely share around 14.72% on total revenue and it jumped to 24.20% in 2012. In contrast, in 2005 the share of interest revenue was decline from 85.25% to 75.8% in 2012. It was because of decreasing from main interest rate revenue such as (i) interest revenue from Bank Indonesia Certificate contributed around 5.13% in 2005 became 1.93% in 2012, (ii) interest revenue from securities contributed 18,99% in 2005 became 4.65% in 2012. According to the data of individual banks, from 111 banks the average share of the FBI to assets was 0.5% in 2011 where foreign banks achieved the highest FBI.

## Policy Implications

Policy implications of this study are:

1. Banking authority should encourage banks to increase capital primarily in Tier I and gradually follow Basel III.
2. In order to maximize profitability, banks must improve efficiency than focus on position in the industry (market share).
3. Banking regulator may consider the FBI as one the measurement of the bank soundness in Indonesia.

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