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**Submission date:** 16-Dec-2019 01:02PM (UTC+0700)

**Submission ID:** 1235231085

**File name:** nce\_Evidence\_from\_Indonesian\_Banking\_Industry\_354474\_-365690.pdf (1.03M)

**Word count:** 6669

**Character count:** 36362



## Market Concentration Index and Performance: Evidence from Indonesian Banking Industry

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### ABSTRACT

The aim of this research is to evaluate the loan market, deposit market, and performance based on basic earning power (BEP) and return on equity (ROE). This research also investigates the relationship between markets and performance. Structure-conduct-performance (SCP) theory is used as the grand theory. This research uses 97 samples from the publication of financial report during 2011-2014. The inferential analysis is conducted by generalized method of moment Arellano and Bond. The research result showed that concentration market index has a significant influence of BEP and ROE, meanwhile market share does not have a significant influence on BEP and ROE. According to SCP theory, this result shows that Indonesian banking industry is in the collusive condition and is not efficient yet.

**Keywords:** Concentration Index, Market Share, Loan, Deposits, Basic Earning Power, Return on Equity

**JEL Classifications:** C23, G21, L11

### 1. INTRODUCTION

The intensity of banking activity which is represented by the growth of funds collection and distribution will impact macroeconomic conditions and banking internal conditions. The banking restructuring to adjust with external changes will be able to change the assets structure, financial structure, and profit structure. The credits distribution and deposits collection are also the implementation of banking function in both theoretical and practical. In a bad condition such as economics crisis, credits distribution will certainly decline. Then, when banking market has recovered from the crisis, the loan growth will increase. The growth of lending activity is reflected by loan to deposits ratio (LDR) which is calculated by the ratio between the volume of loan with volume deposit. The credits volume definition is the total value of credits granted to third parties, while the volume of deposit includes checking, savings, and time deposits.

We can examine the data of banking activity on the loan market and deposit market to find out the intensity of Indonesian banking activity. Referring to the empirical data of Indonesian Banking Statistics, it is stated that in 2001 the loan volume was 316,059

billion. Then, it increased 2.2 times to 695,648 billion in 2005. Meanwhile, in 2010 the amount of total loan was 1,710,677 billion (5.4 times from 2001). Finally, in the end of 2014, the volume of loan reached to 3,526,364 billion (11.16 times from 2001). On the other hand, the deposits growth also increased significantly. In 2001, the deposits collected by the banking sector reached to 957,417 billion. In 2005, the deposits volume was 1,166,065 billion (1.2 times from 2001). Then, in 2010 it increased to 2,274,489 billion rupiah (2.4 times from 2001). Finally, in the end of 2014, deposits volume reached 3,943,697 billion (4.1 times more than in 2001).

In 2001, the LDR of Indonesian banking industry reached to 33%. Then, in 2005, it increased to 59.7%. The increment continued in 2010 up to 75.2%. Finally, in the end of 2014, this ratio reached 89.4%. The loan to deposit ratio (LDR) from 2001 to 2014 are quite high but the ratios still did not reach up to 100%. This indicator shows that Indonesian banking sector is still over-liquidity because the funds that have been collected can't fully be absorbed for economic activities.

Based on the interest rate indicator, the banking market condition is relatively normal. The increase in loan volume and deposits are

followed by a decline in interest rates. The interest rate market benchmark (SBI or Bank Indonesia Certificate) during the period 2001-2014 has decreased from 17.62% to 7.54%. World Bank also has recorded that the deposit rate in Indonesia dropped from 15% to 8% in the period of 2001-2014. Meanwhile, the lending rate in Indonesia also dropped from 19% to 12% in the period of 2001-2014. Interest rate spread in the Indonesian banking market is still relatively from 3% to 3.9% in the period of 2001-2014. There was a progress of Indonesian banking market because real interest rate has rose from 1% to 6% in the period of 2001-2014. This means the decline of inflation in Indonesia is faster than the decline in interest rates the banking market. However, even though Indonesian banking market had a good progress, there was a decline in numbers of banks which operated in Indonesia which is from 145 banks to 119 during 2001-2014. This decline immoderately followed by the increment of bank branch offices which is from 6,765 units to 19,948 units during 2001-2014.

The profitability growth of Indonesian banking is shown by basic earning power (BEP) or economics rentability (RE). There was an increase in BEP from 0.21% to 2.56% during 2001-2014. This growth is occurred because of the increase in net operating income which is greater than the increment in total assets. The total assets increased by 14% meanwhile the net operating income increased by 54%. This indicates that Indonesian market banking was in a good condition.

The significant growth of assets, loans, and deposits which are followed by the decline of interest rate is a normal condition. However, if it is observed carefully, there was an abnormal condition in Indonesian banking. The decline of number of banks shows that there is a tight competition in Indonesian banking market. The banks which could not compete with other banks would make an exit from the industry or even merger with another bigger bank. Meanwhile the big banks which can compete in the market spread their distributions network to maintain and enhance their market shares; this will also make the market concentration greater. The more market is concentrate, the more market will be the monopolistic and the interest rate will be higher. This condition will make a collusive behavior and impede banking efficiency.

The research of Belangkae et al. (2014) which used panel data and 28 samples of commercial banks which were listed in Indonesian stock exchange during 2008-2012 concluded that Indonesian banking behavior supported structure-conduct-performance (SCP) hypothesis and efficiency hypothesis. This means that the growth of market shares occurred because there was a product differentiation and this is important role in increasing banking profitability.

The previous research also comes from Yudaruddin and Hilmawan (2013) used structural and non structural analysis with concentration-stability hypothesis and concentration-fragility hypothesis on commercial and Islamic banking in Indonesia during 2002-2012. They concluded that the increase in market concentration causes the decline of banking competition and increasing collusive behavior on commercial and Islamic banking. However, the collusive behavior creates a banking stability.

Then, Sutardjo et al. (2011) stated there is a decline of market concentration in Indonesian banking which is shown by Herfindahl and Hirschman index (HHI) and CR4. Using Panzar and Rosse method, this research found out that Indonesian market structure has monopolistic characteristic which means the market still relies on interest rate. Moreover, the market structure of Indonesian banking did not change during 1999-2009. The research analysis partially concluded that each group of the bank has monopolistic structure, but joint-venture banks and foreign banks rely on fee based income.

Sastroswito and Suzuki (2012) analyzed the factors of banking profitability in Indonesia during post-crisis, which is in the period of 2001-2008. The research found out that the intensity of cost management, capitalization, and loans significantly affect bank profitability. This research also accepted SCP hypothesis because market concentration has a positive and significant impact on profitability. Macroeconomic factors could not be confirmed because the results are not significant. Lubis (2007) estimated the level of loan market power of Indonesian commercial banks using oligopoly model of Breshnahan-Lau. He concluded that the level of market power in credits is relatively low, or else the level of competitiveness in credits market is quite high.

Based on the previous researches, there are some findings which support each other and conflicting findings. To find out more the Indonesian banking condition, this research arises three questions, which are (1) how is the development of Indonesian banking market structure based on credit market channel and deposit market channel during 2001-2014?, (2) how is the profitability of each individual bank during the different market concentration from 2001-2014?, (3) does market concentration or market share which affect the individual profitability?

## 2. LITERATURE REVIEW

### 2.1. Market Structure Measurement

To find out the development of credits and deposits market structure, we need to measure the proportion of banking individual deposits and credits in total volume of deposits and credits in the industry. Each banks have different market share, which is from 0% to 100% from total volume of industry. Market share of company is formulated as stated below:

$$MS_i = (S_i / S_{tot}) \times 100 \quad (1)$$

Whereas  $MS_i$  is the banking market share of bank  $i$  (%),  $S_i$  is the volume of deposits or credit of bank  $i$  (rupiah), and  $S_{tot}$  = volume of total deposits or credits banks in rupiah.

Then, to calculate the level concentration of industry, we use concentration ratio of four banks (CR4) which is the percentage of total credits and deposits of the four biggest banks in industry.

$$CR_t = \sum_{j=1}^n MS_{jt} \quad (2)$$



Whereas  $MS_i$  is the banking market share of bank  $i$  (%) in year  $t$ ,  $CR_4$  is the score of concentration ratio. The  $CR_4$  is classified as shown below:

- $CR_4 = 0$ : Perfect competition.
- $0 < CR_4 < 40$ : Effective competition or monopolistic competition.
- $40 \leq CR_4 < 60$ : Loose oligopoly or monopolistic competition.
- $60 \leq CR_4$ : Tight oligopoly or dominant firm with a competitive fringe.
- $90 \leq CR_4$ : Effective monopoly or dominant firm with a competitive fringe.

Besides  $CR_4$ , we also can use HHI to find out the market competition condition of banking. This measure is developed by considering all banks in industry. The calculation is stated as below:

$$HHI = \left( \sum_{i=1}^n MS_i^2 \right) \cdot 100 \quad (3)$$

Where  $MS_i$  is the banking market share of bank  $i$ . The maximum score of HHI is 10,000 which indicates there is a concentration power made by the biggest banks. The score is better close to 1 which indicates there is a tight competition. The HHI is classified as follows:

- $HHI < 1000$ : Effective competition atau monopolistic competition.
- $1000 < HHI < 1800$ : Monopolistic competition atau oligopoly.
- $1800 < HHI$ : Oligopoly, dominant firm with a competitive fringe atau monopoly.

Market structure will impact the competition, conduct, and performance of individual bank as the reaction of market condition changes. Therefore, the market players will maintain and enhance their performance to compete. However, the way to raise the performance can have two opportunity: compete efficiently or making a collusion.

## 2.2. Performance Measurement

Profitability ratio (as financial performance) is a ratio that aims to determine the company's ability to generate profits for a certain period, it also gives an idea of management effectiveness in carrying out its operations. Management effectiveness can be seen from the profit generated by sales and the investment of companies. This ratio is also called BEP. Syafri (2008) stated that profitability ratio illustrates the company's ability to earn profit through its capabilities and resources such as sales activities, cash, capital, number of employees, number of bank branches, and so on. The types of profitability ratios, among others, includes gross profit margin, net profit margin, return on investment, return on equity (ROE), earning per share (EPS) and BEP.

The pure profitability is economics BEP which shows the company's ability of generating profit from operating income before interest and tax compared to total assets. If BEP is high, this means the bank has a good efficiency. Brigham and Houston (2010) stated that BEP can be useful in comparing profitability of companies with the taxes. BEP can be calculated by multiplying operating profit margin and total assets turnover. Operating profit

margin is the comparison between operational profit and sales, this ratio describes the pure profit which is earned on every rupiah from the sales. Operating profit is labeled as pure profit because the amount is purely earned from operating activity by abandoning financial liabilities such as interest and tax. The high operating profit margin indicates a good operation activity of the company. The investors use BEP to estimate whether the banking condition is conducive to do investment, because generally the investors tend to be more considering operating profit because this ratio shows the ability of management in utilizing their assets.

Profitability also can be explained by strategic management theory (Rothaermel, 2012) which describes that the relationship between profitability and market structure has a positive correlation. This means the higher market concentration also makes a higher profitability.

## 2.3. SCP

SCP theory analyzes the relationship among SCP in an industry. There are three frameworks of this theory, which is: (1) Traditional hypothesis of SCP which contains a collusive behavior, (2) differentiation hypothesis which contains a product differentiation, (3) efficiency hypothesis which contains an efficiency behavior.

Yudaruddin and Hilmawan (2013) stated that the level of profitability in banking industry is one of indicators used to determine the bank performance. This is based on SCP hypothesis that states the market structure will determine the behavior of industry which also will impact on performance. Market concentration level can be the measurement of structure and the competition level, which means the increase in market concentration makes collusive behavior also higher. This condition will make the biggest banks can have a power to determine the price in order to increase profit.

## 2.4. Previous Researches

Bhatti and Hussain (2010) and Gajurel and Pradhan (2012) found that there is a positive and significant relationship between market concentration and profitability which means this research accepted SCP hypothesis. However, Al-Obaidan (2008) stated that level of concentration is not as anti-competition but it is a consequences from bank efficiency. The other researches come from Samad (2008), Seelanatha (2010), Mensi and Zouari (2010), Rettab et al. (2010), Sanuri (2011), Tajgardoan et al. (2012) who stated profitability is affected by bank efficiency.

The research of Smirlock (1985) rejected SCP hypothesis and accepted efficiency hypothesis because market share has a significant and positive relationship with profitability, and market concentration does not have a significant relationship with profitability. The efficiency is a cost saving which makes the operational activity has a lower cost. Meanwhile the research from Lubis (2007) supported efficiency hypothesis and rejected SCP traditional. Then, Amalia and Nasution (2010) concluded that Indonesian commercial banking supported differentiation hypothesis while Indonesian Islamic banking supported efficiency hypothesis.

The previous researches of Indonesian banking accepted traditional SCP, such as the research from Santoso (2011). However, there are researches that rejected traditional SCP in Indonesian banking, which are the research from Subandi (2013), Raharjo et al. (2014), Ariyanto (2004), Manurung and Dezmercoledi (2013), and Sarita et al. (2012). Some researches even found out the profitability is affected by both market concentration and market share, which are the research from Yudaruddin et al. (2012), Trinugroho et al. (2013), and Sastroswito and Suzuki (2012). The research gap that happened is the main attraction of researchers to go further to prove whether the Indonesian banking industry is already efficient or still in collusive condition.

### 3. RESEARCH METHOD, DATA METHODOLOGY AND HYPOTHESIS

#### 3.1. Research Method

##### 3.1.1. Type of research

This study is an applied research because the purpose of this study is to apply the previous research method and then it will be developed theoretically. This research is also an explanatory research because this study also aims to explain the causal relationship between variables through hypothesis testing (Cooper and Schindler, 2003).

##### 3.1.2. Object of research

The object of this research is banking market industry in Indonesia. Meanwhile, the subject of research is commercial individual banks in Indonesia. This research observes the development of the credit market and deposit market, and the research focus is the performance of the banking industry. The data used is secondary data from published financial statements of the Bank Indonesia, World Bank, BPS, and Indonesian Banking Statistics (SPI) in the period of 2001-2014.

##### 3.1.3. Sampling technique

The population is all the banks which operates in Indonesia from 2001 until 2014. The collected data shows a decrease of number of banks, which is from 145 banks in 2001 to 119 banks in 2014. This research uses purposive sampling technique, which is selecting the sample adjusting to specific criteria (Cooper and Schindler, 2003). The criteria is: (1) The bank which registered in Bank Indonesia, (2) the bank has not ever merged with another bank, (3) the bank has complete data from 2001-2014.

##### 3.1.4. Model specification

To find out the dynamic of market structure based on concentration ratio and its relationship with profitability, this research uses the model stated as below:

$$\begin{aligned} \pi_{it} = & \lambda_0 + \lambda_1 \pi_{i,t-1} + \lambda_2 \text{depMS}_{it} + \lambda_3 \text{dephhi}_{it} + \\ & \lambda_4 \text{MS}_{it} * \text{dephhi}_{it} + \lambda_5 \text{depHHI}_{it} * \text{Size}_{it} + \\ & \lambda_6 \text{ldr}_{it} + \lambda_7 \text{npl}_{it} + \lambda_8 \text{teta}_{it} + \lambda_9 \text{der}_{it} + \\ & \lambda_{10} \text{fbirev}_{it} + \lambda_{11} \text{ocrev}_{it} + e_{it} \end{aligned} \quad (4)$$

To make relationship model between concentration and profitability on credits market, the econometric model as stated as below:

$$\begin{aligned} \pi_{it} = & \eta_0 + \eta_1 \pi_{i,t-1} + \eta_2 \text{loanMS}_{it} + \eta_3 \text{loanhhi}_{it} + \\ & \eta_4 \text{MS}_{it} * \text{loanhhi}_{it} + \eta_5 \text{loanHHI}_{it} * \text{Size}_{it} + \eta_6 \text{LDR}_{it} \\ & + \lambda_7 \text{npl}_{it} + \eta_8 \text{teta}_{it} + \eta_9 \text{lar}_{it} + \\ & \eta_{10} \text{fbirev}_{it} + \eta_{11} \text{ocrev}_{it} + e_{it} \end{aligned} \quad (5)$$

Whereas  $\pi$  is BEP and ROE,  $\text{depMS}$  is market share of individual bank,  $\text{loanMS}$  is market share of credits,  $\text{LDR}$  is loan to deposit ratio,  $\text{teta}$  is capital adequacy ratio (CAR),  $\text{NPL}$  is non-performing loan,  $\text{DER}$  is debt to equity ratio,  $\text{LAR}$  is loan to assets ratio,  $\text{fbirev}$  is FBI proportion in revenue,  $\text{ocrev}$  is overhead cost proportion in revenue.

According Smirlock (1985) and Bhatti and Hussain (2010), traditional SCP hypothesis is accepted if market concentration has a significant effect on profitability while market share does not have a significant effect on profitability.

Credits market channel:

$$\lambda_2 = 0, \lambda_3 < 0, \lambda_4 < 0$$

Deposits market channel:

$$\eta_2 = 0, \eta_3 < 0, \eta_4 < 0$$

Meanwhile, the efficiency hypothesis is accepted if market concentration does not have a significant effect on profitability while market share has a significant effect on profitability.

Credits market channel:

$$\lambda_2 > 0, \lambda_3 = 0, \lambda_4 > 0$$

Deposits market channel:

$$\eta_2 > 0, \eta_3 = 0, \eta_4 > 0,$$

According to Firdaus (2012), the most important criteria used to find the best generalized method of moment (GMM) dynamic model is not biased, which is  $\text{bepLag1}$  GMM estimator is between ordinary least squares (OLS) and the FEM (OLS < GMM < FEM). The instrument is valid if Sargan test can not reject the null hypothesis.

#### 3.2. Research Variables

The operational definition variables are based on the definition of the concept has been modified on the basis of objective circumstances that have been commonly used in previous studies are resumed in Table 1.

### 4. RESEARCH FINDING AND DISCUSSION

#### 4.1. Market Structure in Indonesian Banking

##### 4.1.1. Concentration in credits market

Figure 1 shows the graph analysis of credits market during 2001-2014 shows there was an increase in concentration index on credits



market. First, we analyze concentration index based on the four biggest banks in credits market (loan CR4). During 2001-2010, the concentration index relatively increased. Even though there was a slight decline in 2011, but the concentration index rose up again until 2014. This means, four Indonesian biggest banks authorized the industry. The market share accumulation of four Indonesian biggest banks is about 40%-60% which means Indonesian banking industry is in oligopoly condition.

Based on Figure 2, we analyze concentration index based on the ten biggest banks in credits market (loanCR10). During 2001-2010, the concentration index of ten biggest banks is also relatively increased. Even though there was a slight decline in 2011, but the concentration index rose up again until 2014. This means, ten Indonesian biggest banks authorized the industry. The market share accumulation of four Indonesian biggest banks is about 60%-65% which means Indonesian banking industry is in oligopoly condition.

Lastly, concentration based on HHI in loan market (loan HHI) during 2001-2010 tend to be fluctuated with the fluctuated even though there was a slight decline in 2011, but the concentration

index rose up again until 2014. Based on the score of HHI, we can conclude Indonesian banking industry is in monopoly condition.

4.1.2. Concentration in deposits market

The graph analysis of loan market during 2001-2014 shows there was a decline of concentration index (CR4, CR10, and HHI) on deposits market.

This means the deposits market has a tight competition condition. The four biggest banks authorized deposits market for about 49%-55%, and the ten biggest banks authorized deposits market for about 68-73%. This means the deposits market is in the category of loose oligopoly with the decreasing trend. Meanwhile, based on HHI, the deposits market is in the category of monopolistic competition.

4.1.3. The analysis of performance

The performance of banking industry shows an increase in efficiency during 2001-2014. It can be seen from Figure 3. BEP as the pure profit industry increases because the operating profit margin increases even though assets turnover declines, this means BEP is more affected by efficiency than the company's assets

Figure 1: The trend of concentration index in loan market

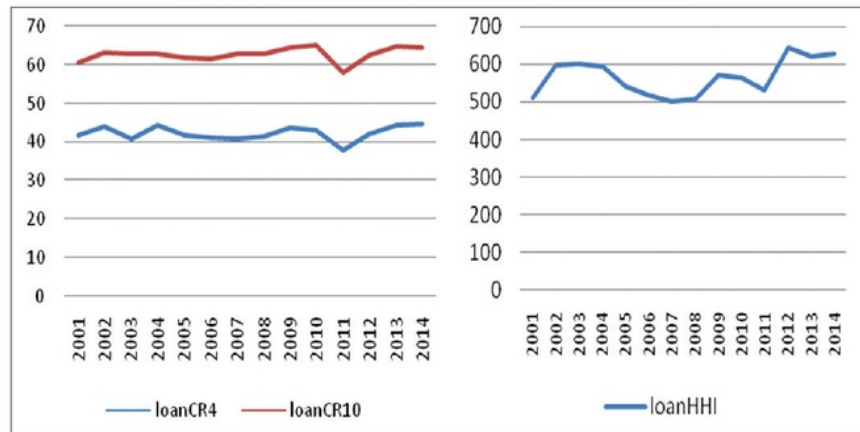
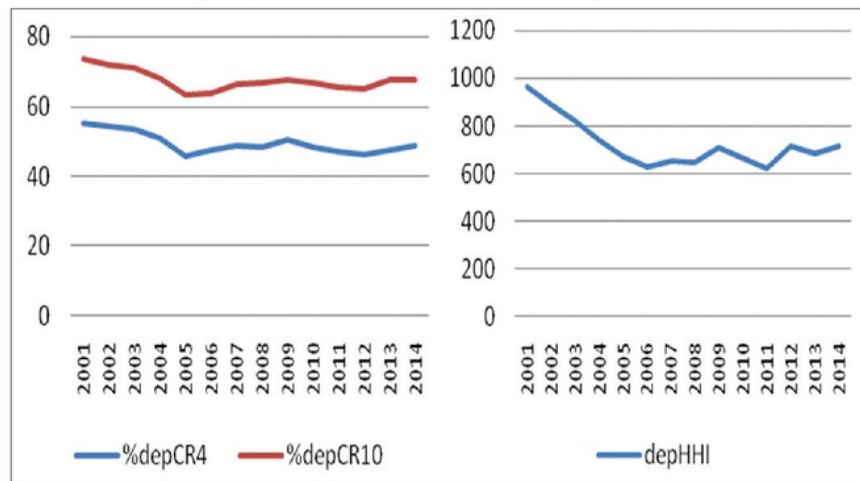


Figure 2: The trend of concentration index in deposits market



turnover. The growth of operating income is faster than the growth of banking assets.

Based on Figure 4, it can be seen that Indonesian banking industry has a significant growth of earning assets (EA). It can be seen from the CSE/EA ratio which declines from 4.7% to 2.6%. This means the banking assets also increases the EA portfolio and makes non-performing assets become lower.

CAR of Indonesian banking is high, which is 15%. Meanwhile teta shows a sharp increase which indicates the capital proportion in assets is high and the strong solvability. Bank's ability to collecting deposits can be improved because the CAR is still far above 8% (as the requirement minimum condition of healthy bank).

LDR of Indonesian banking has a significant growth from 33% to 89% during 2001-2014. This condition occurred not because there is an increase in credits distribution, but it happened because the deposit's growth is followed by the credit's growth. Even though

LDR is high, but the ratio has never reached 100% which means the deposits is not fully distributed by consumers.

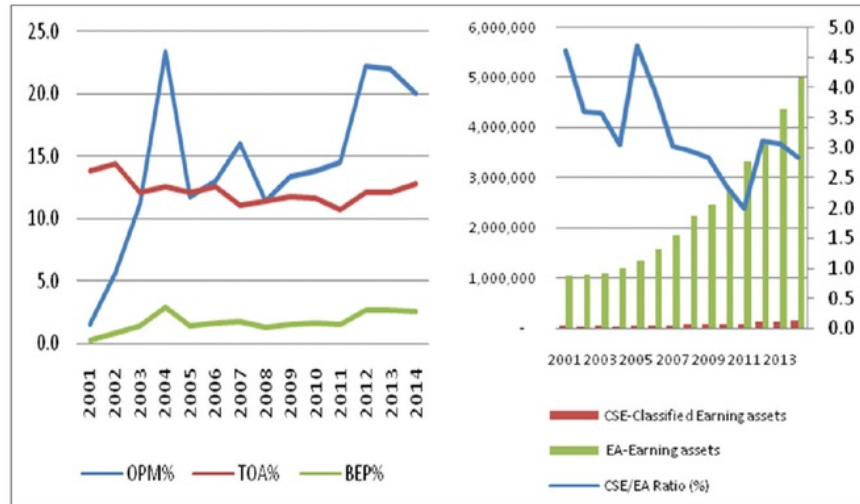
**4.2. Inferential Analysis**

*4.2.1. The impact of market concentration index on banking profitability*

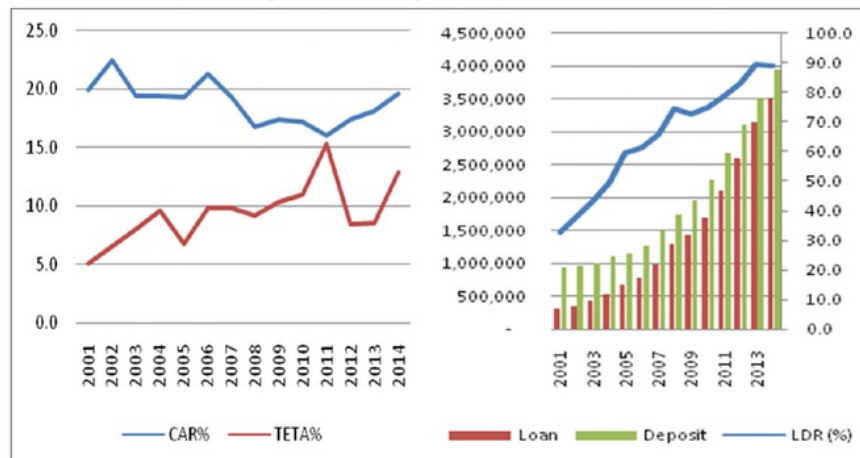
Both deposits and loan market channel models are not biased because the estimator  $L_1, \pi$  GMM is in between OLS estimator and FEM estimator. This indicates the instrument is valid because Sargan test can not reject null hypothesis  $P(\chi^2) > 5\%$ . The models are also consistent because the statistic testing of  $AR_1$  shows that null hypothesis is rejected,  $P(z) < 5\%$ ; while the statistic testing of  $AR_2$  shows that null hypothesis is accepted,  $P(z) > 5\%$ .

The important things from this inferential analysis are: (1) Indonesian banking is still in collusive condition, (2) the prior profitability has a significant influence on current profitability, (3) LDR, teta, and NPL don't have a significant influence on

**Figure 3:** OPM and TOA (left); classified earning assets, earning assets (right) Indonesian Banking Industry



**Figure 4:** Capital (left) and liquidity (right) of Indonesian banking





**Table 1: Summary of operational definition variables and their measurements**

Variable			Definition	Notation	Effect	
Dependent variable	Profit <sub>(it)</sub>	Profit <sub>(i,t-1)</sub>	Net income/total equity (%)	ROE <sub>it</sub>		
			Operating profit/total assets (%)	BEP <sub>it</sub>		
Independent variable-determinant of profitability	Banking perform	Profit <sub>(it-1)</sub>	Net income/prior year equity (%) (lag-1)	ROE <sub>it-1</sub>	+	
		Profit <sub>(i,t-1)</sub>	Operating profit/prior year assets (%) (lag-1)	BEP <sub>it-1</sub>	+	
	Banking market share and structure	Market share and competition	Market share of deposits	Total deposits of individual bank/total deposits of banking industry (%)	Dep MS <sub>it</sub>	+
			Market concentration of deposits	Concentration Ratio of HHI in deposits market	Dep HHI <sub>it</sub>	+
			Market share of loan	Total credits of individual bank/total credits of banking industry (%)	Loan MS <sub>it</sub>	+
			Market concentration of loan	Concentration Ratio of HHI in deposits market	Loan HHI <sub>it</sub>	+
			Variable interaction between market concentration of deposits and size	DepHHIt X size <sub>it</sub>	DepHHI* size <sub>it</sub>	-
			Variable interaction between market concentration of loan and size	Loan HHIt X size <sub>it</sub>	Loan HHI* size <sub>it</sub>	-
			Variable interaction between market concentration and market share of deposits	Dep HHI X dep MS <sub>it</sub>	Ms*Dep HHI <sub>it</sub>	+
			Variable interaction between market concentration and market share of loan	Loan HHIt X loan MS <sub>it</sub>	Ms* loan HHI <sub>it</sub>	+
			Liquidity	Loan to deposit ratio (%)	LDR <sub>it</sub>	+
			Assets quality	Non-performing loan (%)	NPL <sub>it</sub>	-
			Overhead cost	Overhead to revenue (%)	OC/REV <sub>it</sub>	-
			Capital	Equity to Assets ratio	TE/TA <sub>it</sub>	-
		Fee Based Income	Fee income to revenue (%)	FBI/REV <sub>it</sub>	+	
		Leverage	Deposits/equity ratio (%)	DER <sub>it</sub>	-	
		Loan proportion	Loan/assets ratio (%)	LAR <sub>it</sub>	+	

profitability while FBI/REV and OC/REV have influence on profitability.

**4.2.2. The influence of prior profitability on current year profitability**

The results are resumed in Table 2. The impact of prior profitability on current year profitability can be seen from a significant and positive coefficient of  $L_1 \cdot \pi$  which applies on both deposits and loan market. The result shows that  $L_1 \cdot ROE$  coefficient is 0.1231 (significant at 10%) and  $L_1 \cdot BEP$  coefficient is 0.2534 (significant at 1%) in deposits market. While  $L_1 \cdot ROE$  coefficient is 0.1266 (significant at 5%) and  $L_1 \cdot BEP$  coefficient is 0.2248 (significant at 1%) in loan market.

The positive (significant) coefficient is in accordance with the expected results, and it also supports the research from Pervan et al. (2012), Kundid et al. (2011), and Hong et al. (2003).

Turgutlu (2014) stated the range coefficient of  $L_1 \cdot \pi$  is between 0 and 1. The close to zero, the tighter competition condition in the market and there is indication of abnormal profit convergence.

While the closer to one, the more concentrated condition in the market and there is an indication of banking in maintaining abnormal profit. Based on the statement Turgutlu (2014), we can conclude that Indonesian banking is in tight competition both in deposits and loan market.

The influence the prior profitability to the profitability on the current year profitability shows the banking management always considers the achievement of the performance based on the budget, whereas the profitability target for the year is the result of the influence of the achievement of profitability targets have been achieved in the previous year. The small coefficient of  $L_1 \cdot \pi$  indicates the Indonesian banking market is more competitive. This is supported by the descriptive analysis of CR4 and HHI. The graph shows the 50% of deposits market and 45% of loan market are authorized by four Indonesian largest banks. Therefore, Indonesian banking market structure is oligopoly market structure. Based on HHI, it can be seen HHI score declines in deposits market while increases in loan market. Both markets show the monopolistic competition with a strong competition level.



**Table 2: The influence of concentration market index on BEP and ROE**

	Deposit market channell				Loan market channell			
	$\pi$ -ROE		$\pi$ -BEP		$\pi$ -ROE		$\pi$ -BEP	
	Coefficient	P>z	Coefficient	P>z	Coefficient	P>z	Coefficient	P>z
$L_1 \cdot \pi$	0.1297	c	0.2534	a	0.1266	b	0.2248	a
depms	-2.6768		-0.5610	c				
dephhi*size	-0.0038	a	-0.0005	a				
dephhi	0.0539	a	0.0067	a				
ms*dephhi	0.0040	c	0.0003					
Loan MS					-7.6042	b	-0.7689	b
Loan HHI size					-0.0059	a	-0.0009	a
Loan HHI					0.0969	a	0.0122	a
MS*loan HHI					0.0063	a	0.0011	a
teta	0.0036		0.0109		-0.0082		0.0071	
LAR					0.0308		0.0450	a
DER	-0.0002		0.0004					
nplg	-0.4667		-0.0190		-0.4875		-0.0194	
LDR	-0.0394		0.0009		-0.0412		-0.0049	
fbirev	0.1105		0.0294	b	0.0968		0.0304	b
ocrev	-0.0557	c	-0.0464	a	-0.0571	c	-0.0470	a
_cons	22.1463	a	4.0543	a	18.4780	c	2.3162	a
Number of observed/group	1162	97	1162	97	1162	97	1162	97
Wald $\chi^2$ (10)/P	48.07	a	177.55	a	62.39	a	164.28	a
FE $\pi L_1$	0.106	a	0.2027	a	0.09993	a	0.17677	a
Abond $\pi L_1$	0.1297	c	0.2534	a	0.1266	b	0.2248	a
OLS $\pi L$	0.218	a	0.4655	A	0.2196	a	0.46222	a
Sargan, $\chi^2$ (77)/P	82.056		79.8987		85.7814		82.5302	
AR <sub>1</sub> z/P	-2.530	b	-3.7246	A	-2.6634	a	-3.692	a
AR <sub>2</sub> z/P	0.102		-2.036		0.13968		-1.9499	

Source: Secondary data, processed. (a) significant at 1%, (b) significant at 5%, (c) significant at 10%

**4.2.3. Testing of SCP hypothesis**

To find out the type of SCP hypothesis, we can observe the significant of concentration and market share on profitability. If concentration significantly affects profitability while market share does not affect profitability, the traditional SCP hypothesis will be accepted. However, if concentration does not affect profitability while market share significantly affects profitability, it means traditional SCP hypothesis will be rejected which means the market is efficient.

The result shows that HHIs (both in deposits and loan) have a significant impact on profitability (both BEP and ROE) while market shares (both in deposits and loan) do not affect profitability (both BEP and ROE). This means traditional SCP hypothesis is accepted, which also indicates that Indonesian banking industry is in collusive condition.

According to Smirlock (1985), the collusive behavior in banking industry is characterized by, (1) the coefficient index of market concentration positively affects profitability (2) coefficient index of market share does not have a positive effect on profitability (3) interaction coefficient index of market concentration and market share have positive effect on profitability. The research result meets the indicator of, (1-3) both in deposit market and loan market channels.

The interactive variable between HHI and size is proxied by loanhhi\*size and dephhi\*size. The influence of loanhhi\*size and dephhi\*size are negative and significant on BEP and ROE. This indicates that the interaction growth of concentration and size affect the profitability of the company. The accelerated pace of

concentration growth interaction with the company's size is stronger compared to the accelerated pace of operating profit and net profit.

**4.2.4. The influence of control variables**

The research result shows that LDR, NPL, and teta do not have significant influence on profitability. LDR has a negative influence on profitability which means the deposits distributed to consumers as loan does not influence profitability. LAR has a positive and significant influence of BEP in loan market which means the BEP is affected by the loan proportion in bank assets. NPL should have a significant influence on profitability, however the research result shows that NPL does not influence profitability. This condition occurs because the increase in operating income is lower than the increase in assets. teta also does not influence profitability. This occurs because the increase in teta which also raises bank solvability will influence operating profit. However, increase in operating income is lower than the increase in assets.

The revenue structure which is proxied by FBI/REV has a positive and significant influence on BEP, but it does not affect ROE. The coefficient of FBI/REV is 0.029 (significant at 5%) in deposits market and 0.03 (significant at 5%) in loan market. This correlation indicates that the increase in BEP is affected by the proportion of fee based income in revenue.

The revenue structure which is represented by OC/REV has a negative and significant influence on BEP and ROE. The negative coefficient indicates that the decline of overhead cost will increase both BEP and ROE. The decline of overhead cost will increase the percentage of operating profit, this means the efficiency from

overhead cost significantly with increase profit both in BEP and ROE.

## 5. CONCLUSION AND IMPLICATION

### 5.1. Conclusion

Based on the analysis and discussion, it can be concluded that the prior profitability influences current year profitability which means there is a relation of budgeting planning with the previous performance. It is also shown that the competition in Indonesian banking industry is going tighter because the total banks decreases while the total bank branches increase.

Market concentration influences BEP and ROE both in deposits and loan market, meanwhile individual market share does not influence BEP and ROE both in deposits and loan market. This means Indonesian banking is inefficient and still in collusive condition. LDR, NPL, and CAR do not have significant impact on profitability, while the proportion of loan influences BEP. The revenue structure which is represented by FBI only influences BEP, while overhead cost influences both BEP and ROE.

### 5.2. Implication

To increase the efficiency of Indonesian banking industry, they also need to increase the differentiation of banking product by utilizing the Information-Communication-and Technology that fits the market needs which is more competitive. Banks also should increase the proportion of loan to make market share larger but still maintaining the deposit growth, therefore it can increase the function of bank as an intermediary institution in distributing funds. The market share also should be improved through the control of banking competition that is more efficient.

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