

# The Moderating Impact of Market Power on the Relationship Between Market Share and Banking Profitability

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## Abstract

*This study aims to determine the relationship between market power, market share, and profitability, all extremely useful to strengthen the Early Warning System (EWS), in maintaining the stability of the Indonesian Banking System, especially among the Regional Development Banks (BPD). Utilizing SCP-ESH as the principle, analysis was conducted using quarterly financial reports from 24 Indonesian Regional Development Banks over the period of ten years, from 2012 to 2022. Regression analysis from static panel data found that market power directly impacted Return on Assets (ROA) positively while market share had a negative impact. However, when the interaction between these two factors was factored in, they affected the ROA number positively. Control variables such as technical efficiency, fee-based income, and liquidity ratio at the regional level had a positive impact on ROA, while factors such as interest rate spread, capital adequacy ratio, bank overheads, and non-performing loans had a negative impact. Overall, market-power was shown to synergize positively with these control variables.*

**Keywords:** Panel Data Regression, Competition, Market-Share, Efficiency, Profitability.

## Introduction

Market-power, market-share, and profitability are important issues for stakeholders in the banking industry. These stakeholders include banks, bank regulators, investors, and the society as a whole. The implications of their relationship can be observed on financial system stability, economic welfare, market competition, productivity, and regulatory policy and efficiency. The latter two implications are necessary to encourage fair competition and innovation, as well as to protect consumer interests.

In Indonesia, the dominance of the banking sector in the financial industry has shown its vital role in maintaining stability and achieving sustainable economic resilience. As an essential part of Indonesia's national banking industry, Regional Development Banks ('Bank Pembangunan Daerah'; BPD) are envisioned to play the aforementioned role in strengthening the macro-economy both on the regional and national level.

OJK data for 2012-2021, however, revealed that competition in the Indonesian banking market had been increasingly vigorous. Existing banks that were winning the competition were consistently expanding to strengthen financial inclusion. The competition is reflected in a decrease in the number of operating banks, from 120 in 2012 to 107 in 2021, just under ten years apart. However, the increase in the number of branch offices for the remaining banks increased from 2,788 units in 2012 to 32,366 units in 2021; this indicated their efforts in competing to bring services closer to the community.

In the same decade, the Indonesian Banking Concentration Market Index as measured by CR4 (Concentration Ratio 4) showed a quite significant increase. The CR4 figure was within 46.390%-58.814%, indicating that the structure of the Indonesian banking market was transitioning from an oligopolistic market to monopolistic competition. This transition is in accordance with the findings of Octrina & Setiawati (2019), Sinansari et al. (2017), and Wibowo (2017), all suggesting that the structure of the banking industry in Indonesia was leaning towards the formation of an oligopolistic market.

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According to ASBANDA (Association of Regional Development Banks) in 2023, the BPDs have been facing three major challenges. The first and most important is the impact of The Fed's monetary policy on the banking sector, especially in the aspect of the rise of interest rates. This policy can potentially affect lending rates and increase the risks of Non-Performing Loans (NPL). The next concern is in the innovation in sustainable bank operating cost efficiency, as the gateway to stimulate credit demand in the future, which calls for improvement. The final major challenge was the fulfillment of the 3-trillion rupiahs minimum core capital; 12 out of a total of 26 banks in the BPD group have not fulfilled this requirement as of 2023 data. These banks, however, are given time until December 2024. If they achieved sufficient core capital, customers and society alike would be able to expect BPDs to operate with more flexibility and with better risk management. This also emphasizes the importance of BPDs to continuously adapting to the shifting regulations and priorities efficiency and capital sufficiency to maintain their performance and stability in the future.

Another highlight from the 2012-2021 OJK data was how BPDs showed relatively strong performance over the decade. The liquidity range represented a fairly healthy performance. Liquidity, measured with the Loan to Deposit Ratio (LDR), showed quite a range, with the lowest being 75.87% in 2021 and the highest being 93.64% in 2016, the average being 86.67%. On the other side, profitability performance, measured with Return on Assets (ROA), showed a very healthy performance, with ROA ranging from a low of 2.026% in 2021 to a high of 3.179% in 2013, and an average of 2.550%.

Despite the overall good financial performance, BPDs are still struggling to capitalize on national market opportunities. We can observe this from their low deposit and loans share in the national market, with the deposit ranging from 7.85%-9.16%, the average being 8.49%, and the loan only ranging from 8.06%-9.17%, with an average of 8.41%; This low market share indicated that the BPD group was relatively less competitive on a national scale, which was possibly related to its limited market-power and profitability.

The phenomenon described above serves as an early indication of the prevailing dynamics over the last 10 years during which market power, market share, and profitability interacted within the banking market in Indonesia. Given that BPDs have a very prominent role in the local economy, especially in driving regional economic growth, they should be able to become leading banking markets in their respective regions; an interesting point to note. Therefore, onwards, the BPDs should become a more efficient part of the national banking market. This is in reference to the need for improvement in the performance and competitiveness of the BPDs in the face of increasingly complex market challenges. By increasing efficiency, the BPDs could support regional economic development more effectively and fulfill the financial needs of local communities surrounding them.

### *Research Problem*

Previous research on market-power and market-concentration based on banking performance in Indonesia showed several positive and negative sides. Santoso, et al. (2023) revealed two main points in their findings. First, the decline in the number of banks was accompanied by increased competition among banks in Indonesia, especially after 2016. Second, the higher level of concentration and the decrease in competition corresponded with increased opportunities for banking profitability. This is in line with a study by Naylah & Cahyaningratri (2020) which concluded that banks avoid competition to increase their profitability. By forming an oligopolistic-like market structure, participants can maximize profits by collectively controlling service prices and charging higher interest rates.

Alternatively, Nisa (2019) concluded that market-concentration has no effect, whereas market share had a positive effect on profitability. Her findings rebuked the findings of Sari (2016) which suggested that market concentration had a positive effect, and that market-share had a negative effect on profitability, given that SCP-theory applies. Sari's findings, however, were supported by the findings of Naylah (2020) and Jumono (2019), which agreed that the Indonesian banking industry still adopts SCP-theory, not moving towards a banking efficiency industry.

Yudarudin's (2017) research, based on data from 2004-2013, found that the banking industry, especially

BPDs in Indonesia, supports the traditional hypothesis which assumes that concentration is a proxy for market power, and that efficiency variables have no effect on banking performance.

Another study by Wibowo (2017) shows that banking in Indonesia tends to form a collusive oligopoly, while Widyastuti & Armanto (2013) summarized that bank competition in Indonesia forms a monopoly with a tendency for collusion, where BPDs and mixed banks have their own niche markets which enable them to maximise revenue.

Research questions: Why is the profitability of BPDs very healthy/very good, while the market-share of BPD is the smallest on the national level? Is this due to market power in controlling the market or due to their efficiency in banking performance? Is market power able to moderate the relations between market share and profitability? Between the SCP and ESH paradigms: Which one reflects the behavior of the BPD group banks in the Indonesian Banking Industry?

## Objectives of Research

This research aims to investigate the reasons for the excellent health or performance in the profitability of Regional Development Banks (BPDs) despite having a relatively small market share. Discussions in this research include whether this phenomenon is due to the existence of market power that allows control over the market, or due to efficient bank performance. In addition, this research also examines whether market power moderates the relationship between market share and profitability. The subject analyzed in this research is the behaviour of banks belonging to the Indonesian BPD group within the context of the Structure-Conduct-Performance (SCP) and Efficient Structure-Hypothesis (ESH) paradigms.

## Literature Review

The SCP (Structure Conduct Performance) and ESH (Efficiency Market Structure Hypothesis) both analyse the relationship between S (structure of market) and P (performance) of a banking industry. The school of SCP views the relationship between the variables in the S, C, and P as linear, while the ESH school observes the relationship as causal.

The ESH school views excess profit as a result of the efficiency of companies that are able to reduce unit costs, where  $P > MC$  (price per unit is higher than marginal cost per unit). The ESH school refutes the assumptions of SCP-theory and considers efficiency as the key to success in increasing the company's market-share to obtain excess profit, so that the S variable does not always affect P, (Gilbert, 1984). The ESH school of thought suggests that overly strict regulation of the market structure as proposed by SCP results in a decrease in company efficiency.

Although differing perspectives are proposed by these two approaches, they do not necessarily contradict each other. In some cases, a concentrated market structure may result in collusion between competitors, which may reduce company incentives to achieve efficiency. However, in other cases, the same market structure may also allow banks to achieve greater efficiency through economies of scale or more efficient use of resources.

In the banking market, SCP tends to assume that a more concentrated market structure (e.g. oligopoly or monopoly) may entail high market power for companies within. As such, banks may tend to collude or exert their power in the market to set higher prices (e.g. interest rates), which in turn increases profitability. H. H. Khan, Ahmad, & Chan, (2018) noted that banks with significant market-power have the ability to dominate the market so that they can demand high interest rates for financing while charging lower interest rates for the cost of funds. This condition is then utilized to improve their performance.

ESH, on the other hand, accredits significant market power to the banks' ability to achieve greater operational efficiency, such as through economies of scale or through benefitting from their power in negotiating input prices (e.g. raw materials or labor). This also happens if the banking industry tends to be competitive, where it is difficult for banks to pursue maximum income, but it is more possible to increase

efficiency, as in research conducted by Hidayati et al (2017). And these practices, in turn, can increase their profitability.

As developed by Doan et al. (2018), ESH proposes that banks operating efficiently are able to improve their performance. Subsequently, their market share or market power also increases. Thus, the relationship that occurs is the opposite of the hypothesis proposed by SCP. The next alternative theory is the Quiet Life Hypothesis, which suggests that having market power can cause inefficiency, therefore competition between banks actually affects the banks' performance positively.

#### *Relations among Variables*

Company profitability indicates its good prospects as the bigger number of profits shows the efficiency of the company in carrying out its operations. This also indicates the company's ability to pay dividends to shareholders which is a good sign in attracting investors to make capital investments (Sugosha, 2020) or in increasing the number of share ownership (Yondrichs et al., 2021). Fundamentally, the aforementioned effects are able to potentially increase the company's stock demand and stock prices (Amarudin et al., 2019), as well as their value (Rahayu et al., 2020).

In industrial economics, profitability is perceived as the result of collusion (SCP-Theory version of Harvard Business School). Nevertheless, it can also be regarded differently, namely as the result of corporate efficiency (ESH-Theory version of Chicago Business School). The following is an explanation of profitability associated with Structure, Conduct & Performance variables.

#### *The Impact of Competition on Profitability*

Santoso & Jamil (2023) proposed that weak competition leads to price disparities, which in turn makes the market inefficient. Debtors are required to pay higher interest rates, while depositors receive lower interest rates than they should. In short, users receive services at a higher cost than in a market structure with low concentration (high competition).

Research by Alhassan et al. (2015), Banerjee & Savitha (2021), Cherchye & Verriest (2016), and Tuyet & Ninh (2023) all observed a strong relationship between the intensity of competition and the level of profitability. In general, according to the studies, weak competitive dynamics in an industry tend to correlate with higher profits. These observations reinforce the need for a thorough examination of the factors that influence profitability, including examining market structure and industry practices.

Moudud Ul-Huq et al. (2020) and Tan et al. (2017) confirmed that competition and bank profitability have a proportional inverse relationship. The studies also agreed that a decrease in the intensity of competition among banks generally results in an increase in the banks' profits.

Van Hoose (2017) argues that the positive impact (linear relationship) of the MC (market-concentration) variable on P (performance) is detrimental to customers as banks' high performance is obtained through them enforcing high lending-rates and low deposit-rates. Khan, Ahmad, & Chan, (2018) in their study supported the argument that banks take advantage of this condition for profit maximization. In contrast, banks with large market share that pursue a differentiation strategy have a positive impact on market power and banking industry stability (Mirzaei, Moore, & Liu, 2013).

#### *The Impact of Market Share on Profitability*

We can consult the RMP theory model analysis by Ye, et al. (2012) in observing the effect of market share on profitability. Research (Garza-Garcia, 2012; Mirzaei et al., 2013) suggested that the structure of market variables does not affect profitability; it is estimated that there are other variables that determine profitability. One of which is market share. This factor raised another further hypothesis related to the determinants of profitability. This hypothesis is known as Relative Market Power (RMP hypothesis). To test the RMP hypothesis, the structure of market and market-share variables are regressed in one equation.

If the results show that market share has a positive effect while the structure of the market itself has no effect, it can be concluded that the RMP hypothesis holds. This condition was observed in Garza-Garcia (2012) and Hamid (2017).

In banking, there is a savings market share and a credit market share. Market share deposits are needed by banks to attract customer funds and are an important mechanism in the transmission of monetary policy. According to Drechsler et al. (2016) bank deposit offers can be influenced by monetary policy. Rising interest rates influence bank behavior regarding deposit spreads, the amount of deposits collected and credit allocation, especially through bank market power in areas with low levels of competition, where banks have greater market power to regulate deposit spreads. This has an impact on bank funding, credit in the real economy, and overall financial stability.

Meanwhile, market share credit is also needed by banks to distribute credit to generate income. The importance of channel credit has an impact on economic growth because it supports productive activities in the form of investment, production and consumption. Research conducted by Farida et. al (2015) explains that the provision of credit, especially people's business credit, makes a significant contribution to financial inclusion, especially for micro business actors in Indonesia. Apart from that, to get optimal credit, strategies are needed related to strengthening financial literacy and flexible credit policies in accordance with research by Widhiyanto et al. (2018).

Separating credit lines (MSL) and deposit lines (MSD) in the analysis of efficiency and market structure of large banks produces more accurate and relevant results than the combined model. This approach also reduces the risk of bias and multicollinearity, makes interpretation easier, and increases model reliability by capturing the specific dynamics of each pathway. As done by Jumono et al. (2024) which uses a separate approach to enrich research on market structure and bank efficiency in Indonesia. A similar approach is also seen in Ayuningtyas' (2023) research which separates credit channels to analyze the impact of market structure and government ownership on monetary policy transmission, using individual bank data, which provides a specific evaluation of the credit sector.

Mayo et al. (2013) also did the same thing, dividing credit into two categories, namely investment credit and working capital credit, thus enabling analysis of the effectiveness of monetary policy on various types of credit to provide in-depth insight into the response of each category to policy. Herlina (2013) separates the credit channel from the exchange rate channel in examining monetary policy transmission, which allows identifying the specific mechanisms of each channel on policy influence. This path separation approach allows for in-depth and specific analysis of each path, providing a comprehensive understanding of monetary policy transmission mechanisms and banking efficiency.

#### *The Impact of T-Eff (Technical Efficiency) on ROA*

For an interpretation of the influence of T-Eff (Technical Efficiency) on profitability, we should refer to the Relative Efficiency Structure (RES-theory) analysis model of Ye, et al (2012). Ghassan & Guendouz, (2019) and Vasilyeva et al., (2016) stated that high-efficiency operating cost indicates that banks are able to optimize their deposits to be channeled in the form of FBI-generating loans and investments, resulting in highly profitable ROA.

#### *The Impact of LDR (Loan Deposit Ratio) on ROA*

The effect of LDR on ROA is explained in the liquidity profitability trade-off. Pinasti & Mustikawati (2018) stated that under normal conditions, LDR and banking profitability tend to move in the same direction, provided that the bank is managed professionally.

J. Dong, et al. (2020) found that in the case of commercial banks in China, offering internet banking to customers had contributed positively to profitability and liquidity. Achieving higher liquidity allows banks to increase credit, which in turn can potentially increase interest income and contribute to increased profitability. The findings of Astutiningsih & Baskara (2019), Yunanto, Suhariadi, & Yulianti (2019),

Sadiyah (2021), and Pratama & Afriansyah (2021) also found the positive effect of LDR on bank ROA; however, Pinasti & Mustikawati in 2018 found evidence that LDR has no effect on profitability.

#### *The Impact of IRS (Interest Rate Spread) on ROA*

Research by Musah et al. (2018) in Ghana concluded that IRS (Interest Rate Spread) is positively associated with bank profitability. Previously, Owusu-Antwi et al (2017), also in Ghana, have concluded that IRS (Interest Rate Spread) has a significant positive effect on the ROA of commercial banks. Conversely in Nigeria, the results of Obidike, et al (2015) actually concluded that the spread has a significantly negative effect on the financial performance of banks in the country. In this context, statistically 'negative and significant' effect implies that an increase in spread is associated with a decrease in ROA and ROE. This relationship is unlikely to occur coincidentally. In other words, the findings suggest that an increase in spread tends to have a negative effect on the financial performance of banks in Nigeria.

Furthermore, studies by Urbschat (2018), Molyneux, Reghezza, and Xie (2019), and Beauregard & Spiegel (2020) also argued that negative spreads can potentially reduce bank profitability in the long run, partly due to the banks' limited ability to pass on the spreads to deposits or make adjustments to their business models.

#### *The Impact of CAR (Capital Adequacy Ratio) on ROA*

Previous studies have shown that CAR or Capital Adequacy Ratio has a significant positive effect on bank ROA. This is due to the increased CAR that serves as a hedge against risk, which increases investor and customer confidence towards the bank and lowers the cost of capital. A study by Rembet & Baramuli (2020) concluded that CAR has a significant effect on ROA, and their finding is in line with Adhista (2020), who suggested that CAR has a significantly positive effect on ROA, and an increase in CAR indicates that there is sufficient capital development, ensuring safe expansion.

#### *The Impact of FBI (Fee-Based Income) on ROA*

A study by Ernst & Young in 2021 highlighted the three main things banks are required to observe in managing Fee Based Income activities: risk management, cost management, and appropriate technology implementation (Ernst & Young, 2021).

Lee, J. W., & Mohanty, S. (2018) analyzed the effect of FBI or Non-Interest Income on bank performance in South Korea. The results showed that the components of Non-Interest Income, namely Fee Income, Trading Income, and Other Non-Interest Income had no effect on bank performance. They also argued that only Trust Management had a positive effect on bank performance. This suggests that Korean banks were still unable to maximize revenue from Non-Interest Income. The following year, Ammar & Boughrara (2019) examined the same issue, and the results also showed that Fee Income and Trading Income had a positive effect on bank performance.

Focusing on a large cross-country sample of European and Japanese banks, Lopez, Rose, and Spiegel (2020) reported that the favorable implication of negative spreads on profitability is due to banks managing to cover losses under negative interest rates with gains from fee-based income, including fees and capital gains. On the contrary, Rostagno, et al. (2019) estimated that bank profitability in the European region would be lower in a counterfactual scenario where the policy rate remains above or equal to zero.

#### *The Impact of OCB (Overhead Cost Bank) on ROA*

When observing the effect of OCB (Bank Overhead Cost) on ROA, we shall refer to Linawati, et al (2023), which study suggested that an increase in bank operating costs affected a decrease in profitability as bank overhead costs increased and ROA decreased, similar to the findings of C.T. Albuлесcu (2015) that concluded that overhead costs eroded profitability. However, when referring to Shahriar, et. al. (2023), we see that overhead costs potentially have a significantly positive effect on bank stability in West Asian

countries.

*The Impact of NPL (Non-Performing Loan) on ROA*

The NPL ratio is used in evaluating a bank's capacity to manage the risk of debtors failing to fulfill their obligations. The probability of loan failure increases with NPL, which has the potential to lower both income and profitability from interests. Losing the opportunity to earn profits from defaulted loans has a direct impact on earnings as it negatively affects profit projections, and as NPL number increases and banks lose opportunity to earn profits ROA numbers decrease (Zulfikri et. al., 2022). This scheme has also been argued by Priyanti, E., & Oktoriza, L. (2023), whose study concluded that NPLs have a significantly negative effect on ROA.

*The Correlation between Market Power Interaction with Control Variables*

The effect of market-power interaction with control variables in this study is used to determine whether bank market power is able to moderate control variables in relation to profitability as the dependent variable. Particularly, the results of the analysis of the influence of market power and market share on profitability is used to confirm whether the bank's behavior reflects the ESH or SCP theory. The hypotheses of each independent variable can be seen in the research framework and table 1 (operational definition, notation and expected).

*Research Framework*

Below is the study model in this research.

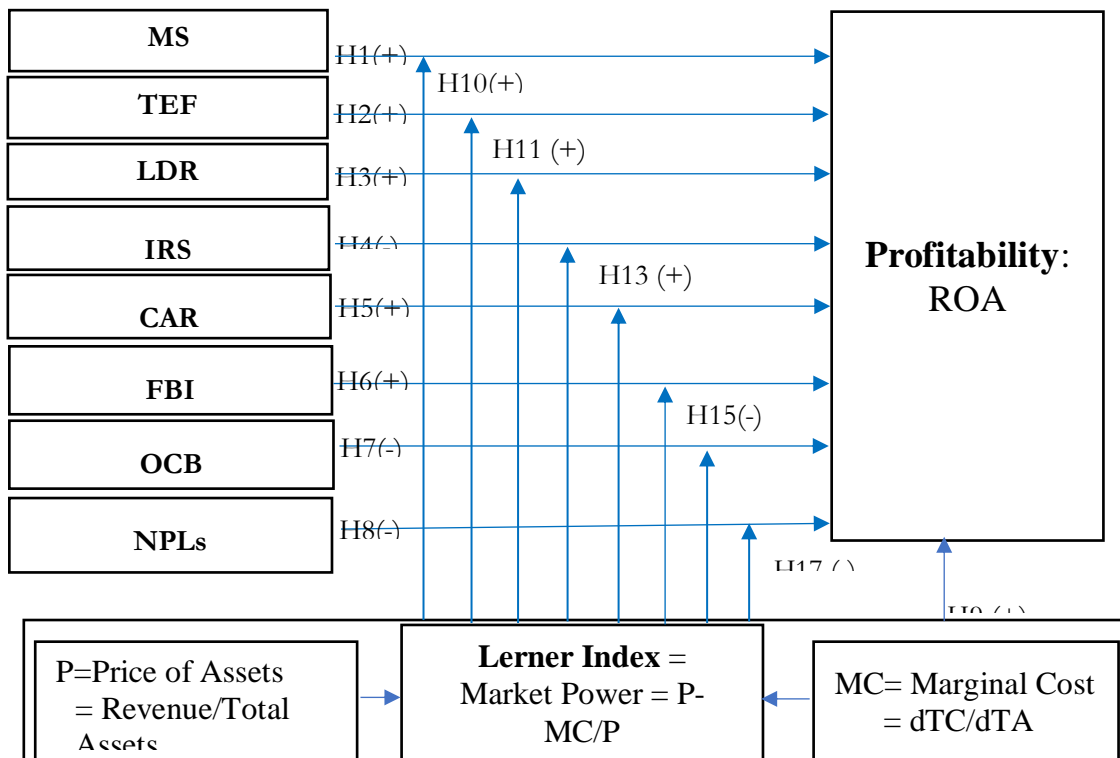


Figure 1. Research Framework

## Methods

### Research Design

Our samples were conventional banks in the BPD group in Indonesia, totalling 24 out of 27 banks. The samples were taken from the quarterly data from 2012 to 2022. The regression model adopted that of Smirlock (1985), Samad (2008), Bhatti & Hussain (2010), Jumono, et al., (2019) and Naylah (2020) models. The calculation is as follows:

$$\pi_{i,t} = \alpha_0 + \alpha_1 LIDX_{i,t} + \alpha_2 MS, L, D_{i,t} + \alpha_3 MS, L, D * LIDX_{i,t} + \alpha_t Z_{i,t} + e_{it}$$

where  $\pi$  = profit rate on ROA (*Return on Assets*);  $MSL_{i,t}$  = Market Share of Loan for bank-i in year t;  $MSD_{i,t}$  = Market Share of Deposits for bank-i in year t;  $LIDX_{i,t}$  = Lerner Index (market-power)-i in year t;  $MS * LIDX_{i,t}$  = multiplication between MS and LIDX for bank-i in year t;  $Z$  = vector of additional control variables found to have prominent effect on profitability in existing studies;

$$Z_{i,t} = \alpha_4 LDR_{i,t} + \alpha_5 IRS_{i,t} + \alpha_6 CAR_{i,t} + \alpha_7 TEF_{i,t} + \alpha_8 FBI_{i,t} + \alpha_9 OCB_{i,t} + \alpha_{10} NPLs_{i,t} + e_{it}$$

where  $LDR_{i,t}$  = Loan to Deposit Ratio for bank-i in year t;  $IRS_{i,t}$  = Interest Rate Spread for bank-i in year t;  $CAR_{i,t}$  = Capital Adequacy Ratio for bank-i in year t;  $FBI_{i,t}$  = Fee Based Income for bank-i in year t;  $OCB_{i,t}$  = Overhead Cost Bank for bank-i in year t;  $NPLs_{i,t}$  = Non-Performing Loans for bank-i in year t.

In this study, market power is tested on its ability to moderate variables  $MSL$ ,  $MSD$ ,  $LDR$ ,  $IRS$ ,  $FBI$ ,  $OCB$  and  $NPLs$ . The estimated resulting empirical model is as follows:

$$\begin{aligned} ROA_{it} = & \alpha_0 + \alpha_1 MSLD_{it} + \alpha_2 TEF_{it} + \alpha_3 LDR_{it} + \alpha_4 IRS_{it} + \alpha_5 CAR_{it} + \alpha_6 FBI_{it} + \alpha_7 OCB_{it} \\ & + \alpha_8 NPLs_{it} + \alpha_9 LIDX_{it} + \alpha_{10} LIDX_{it} * MS, L, D_{it} + \alpha_{11} LIDX_{it} * TEF_{it} \\ & + \alpha_{12} LIDX_{it} * LDR_{it} + \alpha_{13} LIDX_{it} * IRS_{it} + \alpha_{14} LIDX_{it} * CAR_{it} \\ & + \alpha_{15} LIDX_{it} * FBI_{it} + \alpha_{16} LIDX_{it} * OCB_{it} + \alpha_{17} LIDX_{it} * NPLs_{it} + \varepsilon_{it} \end{aligned}$$

where  $ROA_{it}$  = Return on Assets for bank-i in year t; ;  $MSL, D_{it}$  = Market Share of Loans and Deposits for bank-i in year t; ;  $TEF_{it}$  = Technical Efficiency for bank-i in year t;  $LDR_{it}$  = Loan to Deposit Ratio for bank-i in year t;  $IRS_{it}$  = Interest Rate Spread for bank-i in year t;  $CAR_{it}$  = Capital Adequacy Ratio for bank-i in year t;  $FBI_{it}$  = Fee-Based Income for bank-i in year t;  $OCB_{it}$  = Overhead Cost Bank for bank-i in year t;  $NPLs_{it}$  = Non-Performing Loans for bank-i in year t;  $LIDX_{it}$  = Lerner Index for bank-i in year t.

### Operational Definition of The Variables

The operational definitions of the variables in this study were made based on the definition of concepts adapted to the conditions of the objects while also considering previous relevant research, naturally by adapting to the conditions of the banking sector in Indonesia.

Table 1. Operational Definitions of the Variables and the Methods of Measurement

Variable		Definition/ Formula	Notation	Expected	Source	
INDEPEND	Performance	Profitability (Return On Assets)	$\frac{\text{Income Before Tax}_{it}}{\text{Total Assets}_{it}}$	ROA	Circular Letter No. 13/30/DPNP on December 16 <sup>th</sup> 2011	
DEPEND	Structure of	Market-Power (Lerner Index)	$\frac{\text{Price}_{it} - \text{Marginal Cost}_{it}}{\text{Price}_{it}}$	LIDX	+	Li & Peng (2024); Shaffer & Spierdijk



					(2020); Saif, et al. (2018)
	Market-Share Of Deposit	$\frac{\text{Deposits}_{it}}{\text{Deposits province}_{it}}$	MSDp	+/-	Segev, et al. (2024); Kho (2024) Sarkisyan & Viratyosin (2024)
		$\frac{\text{Deposits}_{it}}{\text{Deposits National}_t}$	MSDn	+/-	
	Market-Share of Loan	$\frac{\text{Loans bank, it}}{\text{Loans bank National, it}}$	MSLn	+/-	Mamonov, et al. (2024); Borili (2021)
		$\frac{\text{Loans}_{it}}{\text{Loans Province}_{it}}$	MSLp	+/-	
ALMA	Liquidity	$\frac{\text{Loans}_{it}}{\text{Loans National}_t}$	LDR	+	Kulu & Bondzie (2024); Thakor & Yu (2024)
	Interest Rate Spread	$\frac{\% \text{Loan rate}_{it}}{\% \text{Deposits rate}_{it}}$	IRS	-	Eggertson, et al (2024); Dupoyet, et al. (2024)
	Capital Adequacy Ratio	$\frac{\text{Capital}_{it}}{\text{Risk Average Assets}_{it}}$	CAR	+	Andersen & Juelsrud (2024); Olawale (2024)
	Fee Based Income	$\frac{\text{Fee Based Income}_{it}}{\text{Revenue}_{it}}$	FBI	+	Nugroho, et al. (2024); Kaur & Bansal (2024)
	Overhead Cost Bank	$\frac{\text{Overhead Cost}_{it}}{\text{Revenue}_{it}}$	OCB	-	Abbas, et al. (2024); Jarbou, et al. (2024)
	Non-Performing Loans	$\frac{\text{NonPerforming Loan}_{it}}{\text{Total Loan}_{it}}$	NPLs	-	Chun, et al. (2024); Takahashi & Vasconcelos, (2023)
	<b>Interactive Variables:</b>				
	LIDX with MSDp	LIDX multiplied by MSDp	LIDX*MSDn	+	Ebrahimi & Reyhanzadeh (2024)
	LIDX with MSDn	LIDX multiplied by MSDn	LIDX*MSDp	+	
	LIDX with MSLn	LIDX multiplied by MSLn	LIDX*MSLn	+	
	LIDX with MSLp	LIDX multiplied by MSLp	LIDX*MSLp	+	
	LIDX with TEF	LIDX multiplied by TEF	LIDX*TEF	+	

	LIDX with LDR	LIDX multiplied by LDR	LIDX*LDR	+	Tran & Nguyen (2023)
	LIDX with IRS	LIDX multiplied by IRS	LIDX*IRS	+	Mangwengwende, et al 2011
	LIDX with CAR	LIDX multiplied by CAR	LIDX*CAR	+	Li, et al. (2016)
	LIDX with FBI	LIDX multiplied by FBI	LIDX*FBI	+	Mahayana & Chalid (2021)
	LIDX with OCB	LIDX multiplied by OCB	LIDX*OCB	+	Huang, et al. (2018)
	LIDX with NPLs	LIDX multiplied by NPLs	LIDX*NPLs	+	Karadima & Louri (2020)

Source: proceed by author, 2024

In this particular scenario, the relationship between market power and profitability was analysed to examine which of the traditional hypotheses, namely the differentiation hypothesis and the efficiency hypothesis, was proven. For this purpose, four stages of regression were conducted, which are:

- Examining whether the bank's behaviour supports the traditional SCP hypothesis and the coefficient MS is below 0, meaning that the influence of the market share is insignificant or not positive on ROA, as well as testing whether the coefficient LIDX is above 0, which has the opposite indication: that the bank's influence from its market power is significantly positive on ROA;
- Examining whether the studied banks support the differentiation efficiency hypothesis. In order to do this, a restriction that the coefficient of LIDX variable has to be equal to 0 is established, meaning that the effect of market power is not significant or not positive on ROA, but if the coefficient of MS stays above 0, the effect is significantly positive on ROA;
- Assessing whether the behavior of the studied banks supports the differentiation efficiency hypothesis. To do this, the regression is conducted without any restriction, meaning MS and LIDX are regressed together. If ROA is more affected as the result of differentiation efficiency, the coefficient of LIDX\*MS that is below or equal to zero (as the effect of the interaction between MS and LIDX) does not really affect ROA. If the coefficient of LIDX is equal to 0 and the coefficient of MS is above 0, it would be because the relationship between market share and concentration proxied by market-power on profitability is falsified;
- Assessing whether the behavior of the banks under examination supports the SCP-Theory hypothesis. To do this, MS\*LIDX is employed to further prove whether profits are the result of collusion. If true, the coefficient of MS\*LIDX would be above 0 (positive), suggesting that profit sharing would increase in proportion to the market share relative to industry concentration. And if collusion does not emerge in an industry, the coefficient of MS\*LIDX would be equal to or below 0 (negative).

This research used panel data regression, which combines cross-sectional and time series data to analyze the relationship between variables. Panel data regression provides great advantages in capturing the dynamics of periodic changes as well as differences between individuals or entities. The first stage after the panel data was prepared was conducting the Chow test, which aimed to determine whether the Common Effect or Fixed Effect model is more suitable for this study. If the result is significant, the Fixed Effect model would be preferred.

Furthermore, the Lagrange Multiplier Test (LM test) was conducted to verify whether the Random Effect model is better than the Common Effect. If the LM test yields significant results, Random Effect model will be considered. The next stage is the Hausman test, which serves as a way to select between Fixed Effect and Random Effect models. If a significant result is observed, the Fixed Effect model is more applicable. Otherwise, the Random Effect model would be favored.

After determining the applicable model, a Classical Assumption Test was performed to ensure that the regression model does not contain any statistical problems that could potentially tamper the results. This test includes multicollinearity test, heteroscedasticity test, and autocorrelation test. Multicollinearity is applied to ensure the appropriate rate of correlation between the independent variables, while heteroscedasticity and autocorrelation are applied to ensure the residual errors do not vary systematically.

The last phase is interpreting the regression results. At this stage, the regression coefficients are analyzed to see the effect of the independent variables on the dependent ones, as well as their statistical significance. This interpretation should provide important information on which variables have a significant effect, the direction of the effect, and how substantial their contribution is to the dependent variable in the chosen model.

## Results and Discussion

### *Descriptive Statistics*

Descriptive statistics in this study are used to explain and describe observations, mean (average), standard deviation, minimum value and maximum value on the variables, in addition to being the first step before analysing further data for a clear overview of the general information. The results are as follows.

**Table 2. Descriptive Statistics of Variables**

	Observations	Mean	Median	Maximum	Minimum	Std. Dev.
ROA	1056	0.020880	0.020580	0.060720	-0.032680	0.007846
LI	1056	0.230286	0.229410	0.502370	-0.328860	0.090943
MSLN	1056	0.003646	0.002490	0.019400	0.000300	0.003520
MSLP	1056	0.156273	0.141590	0.503670	0.017490	0.082194
MSDN	1056	0.003754	0.002660	0.018320	0.000220	0.003534
MSDP	1056	0.221682	0.196030	0.696110	0.011680	0.116744
TEF	1056	0.758100	0.748970	1.000000	0.441520	0.143907
LDR	1056	0.784008	0.778940	1.504550	0.346900	0.140484
IRS	1056	0.072649	0.072100	0.182810	0.009900	0.033913
CAR	1056	0.209029	0.206200	0.337900	0.100400	0.042407
FBIREV	1056	0.094908	0.077360	0.532070	0.009730	0.065652
OCREV	1056	0.413785	0.405200	1.129600	0.158600	0.107449
NPLG	1056	0.027661	0.023300	0.199300	0.000430	0.022927

Source: data processed, 2024

The following is information from the Regional Development Bank (BPD) data for the 2012-2022 period on a quarterly basis, with a total of 1056 observations covering 24 selected sample banks. This data includes 13 research variables, as listed in Table 2, for each variable as follows:

ROA (Return on Assets), an average of 0.02088 shows the bank's overall profitability. However, there are significant differences, with the maximum value of 0.06072 reflecting banks with outstanding performance, and the minimum value of -0.03268 indicating some banks experienced losses. A standard

deviation of 0.00785 indicates moderate variation.

LI (Lerner Index), the average value of 0.2303 indicates a moderate level of market competitiveness. The maximum value of 0.50237 indicates a bank with significant market strength, while the minimum value of -0.32886 indicates a bank that experiences extreme weakness in dominating the market. The standard deviation of 0.09094 reflects differences in competitiveness between banks.

MSLN (Market Share of Loans – National Level), the average of 0.00365 reflects the small loan market share at the national level. The maximum value of 0.01940 indicates a bank that dominates part of the national market, while the minimum value of 0.00030 indicates a bank with a very small market share. A standard deviation of 0.00352 reflects a narrow distribution.

MSLP (Market Share of Loans – Province Level), with an average of 0.15627, the market share at the provincial level is much larger than the national level. The maximum value reaches 0.50367 indicating that several banks dominate significantly, while the minimum value of 0.01749 indicates banks with little influence. The standard deviation of 0.08219 shows that there are differences between provinces.

MSDN (Market Share of Deposits – National Level), an average of 0.00375 indicates a small national deposit market share, with a maximum value of 0.01832 for dominant banks, and a minimum value of 0.00022 for banks with small contributions. A standard deviation of 0.00353 indicates little variation at the national level.

MSDP (Market Share of Deposits – Province Level), an average of 0.22168 indicates a greater concentration of deposits at the provincial level compared to the national level. The maximum value of 0.69611 indicates high dominance by a few banks, while the minimum value of 0.01168 indicates banks with minimal contribution. The standard deviation of 0.11674 indicates significant differences between regions.

TEF (Technical Efficiency), with an average of 0.7581, most banks show high technical efficiency, with the maximum value reaching perfect efficiency (1.0000). However, the minimum value of 0.44152 indicates an inefficient bank. The standard deviation of 0.14391 shows variations in efficiency between banks.

LDR (Loan to Deposit Ratio), an average of 0.7840 indicates a healthy financing to deposit ratio. However, the maximum value of 1.50455 indicates some banks exceed the optimal limit, while the minimum value of 0.34690 indicates banks with lower lending activity. The standard deviation of 0.14048 shows differences between banks.

IRS (Spread), An average of 0.07265 indicates a moderate interest rate differential between loans and deposits. The maximum value of 0.18281 reflects large spreads across banks, while the minimum value of 0.00990 indicates very low spreads. The standard deviation of 0.03391 indicates small variation.

CAR (Capital Adequacy Ratio), with an average of 0.20903, most banks meet good capital adequacy. The maximum value of 0.3379 indicates very strong capital, while the minimum value of 0.1004 is close to the lower limit of regulation. The standard deviation of 0.04241 indicates variation between banks.

FBIREV (Fee-Based Income Revenue), an average of 0.09491 indicates a significant contribution of fee-based income, with a maximum value of 0.53207 for banks that rely heavily on this income, and a minimum value of 0.00973 for banks with low contributions. A standard deviation of 0.06565 indicates quite large variation.

OCREV (Operational Cost Revenue), an average of 0.41378 indicates operational cost efficiency, with a maximum value of 1.12960 for less efficient banks, and a minimum value of 0.15860 indicating high efficiency. The standard deviation of 0.10745 reflects variations between banks.

NPLG (Non-Performing Loan Gross), average 0.02766 indicates quite low credit risk. The maximum value of 0.1993 indicates some banks with serious credit problems, while the minimum value of 0.00043 indicates banks with very low credit risk. A standard deviation of 0.02293 indicates moderate fluctuations in credit quality.

Thus, this analysis shows significant differences between variables on a national and provincial scale. The market share of loans and savings is higher at the provincial level than at the national level. Technical efficiency (TEF) and capital adequacy (CAR) indicate the stability of banking operations, despite variations in interest spreads (IRS) and credit risk (NPLG). These findings emphasize the importance of technical efficiency and capital adequacy in maintaining bank stability and profitability.

## Research Result

Table 3 shows the summary of a series of statistical analytical procedures of static panel data. From the analysis results, GLS panel data model is selected for the interpretation process. To achieve accurate conclusions, the analysis in the study uses two channels, namely Credit Market Channel and Deposits Market Channel, each has two analysis paths, namely national and regional/provincial market share.

Based on the coefficient and level of significance from Table 3, the factors that affect the profitability of ROA (Return on Assets) in the BPD group in Indonesia can be obtained. The coefficient of the variables Lerner Index or LIDX (as a proxy of Market-power), TEF (Technical-Efficiency), FBI (Fee Based Income) and LDR (Loan to Deposits Ratio) on MS-Deposits in deposits market channel analysis show a positive influence on ROA.

Additionally, the variables that negatively affect ROA are MS-Loans & MS-Deposits-national, IRS (Interest rate spread), CAR (Capital Adequacy Ratio), OCB (Bank Overhead Cost) and NPLs (Non-Performing Loans), while the variables that have no effect on ROA are only LDR in columns 2,3 & 4 and FBI in columns 2 & 4.

In general, the effect of the interaction between LIDX (market-power) and these factors in influencing ROA is quite significant. This shows that LIDX is able to mediate these factors on ROA. Positive effect is observed in the interaction between LIDX and TEF, FBI, MSDp and LDR, while the variables MSLn, MLp, MSDn, CAR and NPLs in their interaction with LIDX show a negative effect. This means that LIDX is able to mask the negative influence, resulting in an overall positive effect on the surface.

Table 3. Regression Analysis Results

Dependen variable: ROA	Credit Market Channel		Deposits Market Channel	
	National	Province	National	Province
Independen variable:	<i>Coef.</i>	<i>Coef.</i>	<i>Coef.</i>	<i>Coef.</i>
LIDX-Market-power	2.65839***	3.25050***	2.41310***	3.43103***
MSLn-MS Loan, national	<b>-1.01636***</b>			
MSLp-MS Loan, province		<b>-0.03901**</b>		
MSDn-MS Dep, national			<b>-1.0979***</b>	
MSDp-MS Dep, province				0.03637**
TEF-Technical-Efficiency	0.97861***	0.76881**	1.05935***	0.84062**
LDR- Loan to Deposit Ratio	0.47834	0.28897	0.39818	0.56319*
IRS-Interest Rate Spread	<b>-1.94643*</b>	<b>-1.99837**</b>	<b>-2.22841**</b>	<b>-1.33606</b>
CAR-Capital Adequacy Ratio	<b>-7.28063***</b>	<b>-5.05419***</b>	<b>-7.5049***</b>	<b>-5.89028***</b>
FBI-Fee Based Income	0.58322	0.81221**	0.54023	0.96149**
OCB-Overhead Cost Bank	<b>-6.05292***</b>	<b>-6.43850***</b>	<b>-5.8651***</b>	<b>-6.47518***</b>
NPL-NonPerforming Loans	<b>-9.42726***</b>	<b>-13.4859***</b>	<b>-8.6084***</b>	<b>-14.5138***</b>
LIDX*MS	0.41772***	0.17623***	0.45544***	0.06598***
LIDX*TEF	0.04742***	0.02959*	0.04550**	0.02893

LIDX*LDR	0.05194**	0.03633	0.05601**	0.05443**
LIDX*IRS	<b>-0.03717</b>	<b>-0.00370</b>	<b>-0.05198**</b>	0.03617
LIDX*CAR	0.10359***	0.14215***	0.08947***	0.16781***
LIDX*FBI	0.27582***	0.30709***	0.26574***	0.31992***
LIDX*OCB	<b>-0.04049**</b>	<b>-0.02348</b>	<b>-0.04364**</b>	<b>-0.02758</b>
LIDX*NPL	0.03072	0.09261**	0.03647	0.13751***
_cons	439.728***	324.784***	471.267***	274.845***
Number of obs	1056	1056	1056	1056
Num of groups	24	24	24	24
Time periods	44	44	44	44
Wald chi <sup>2</sup> (17)	1568.13	1576.25	1651.47	1394.85
Prob > chi <sup>2</sup>	0.00000	0.0000	0.00000	0.0000
Coefficients:	Gen.least sq	Gen.least sq	Gen.least sq	Gen.least sq
Panels:	homoskedastic	homoskedastic	homoskedastic	homoskedastic
Correlation:	no autocorr	no autocorr	no autocorr	no autocorr

Note: \* Indicates statistical significance at the 10% level, \*\* indicates statistical significance at the 5% level, and \*\*\* indicates statistical significance at the 1% level

#### *The Impact of Market Power on ROA*

We can observe the effect of market power on bank ROA here. This suggests that the size of a bank's ROA depends on its market power. Positive market-power effect on the national scope is seen as being greater than the regional-provincial scope; this is normal, as each BPD bank in each regional area is more familiar with the characteristics of their respective regions. Therefore, their market power is naturally more substantial in controlling their own market, in terms of market share of loans and/or deposits.

#### *The Impact of Market Share on ROA*

This can be seen in the coefficients of MS-Loan, MS-Deposits. The significant negative coefficient on MS-Loan indicates that the negative effect on MS-Loan in the national scope is greater than MS-Loan in regional-provincial scope. In other words, the sensitivity of national MS-Loan is more significant than provincial MS-Loan in suppressing ROA; this information indicates that in the national credit market, each BPD bank in its region is pressured by the emerging banks. Furthermore, the analysis of the deposits channel shows a significant negative coefficient on national MS-Deposits, while a positive effect is observed on provincial MS-Deposits. This indicates that provincial market-share deposits affect ROA positively, unlike the effect of national MS-Deposits which in fact weakens ROA.

#### *The Impact of the Interaction between Market Power and Market Share on ROA*

The impact of the interaction can be clearly seen in the coefficients of LIDX\*MS in Table 2, which all show a positive effect on bank ROA. These data indicate that the negative impact of market-share can be mitigated when market-power increases, counterbalanced by the positive effect of market power thus positive effect on ROA is apparent overall. In this case, the variable market power is able to act as a competitive mediator of market share in influencing ROA. The positive effect minimizes the negative impact of market share on ROA, even transforming it into a positive one. On the other hand, from the regional deposit market share (column 5), we can observe that market power acts as a complementary mediator for the regional deposit market share in influencing ROA.

#### *The Impact of Technical Efficiency on ROA*

Technically efficient banks can optimize the use of their resources to achieve maximum returns. We can observe this theory in the TEF-Technical-Efficiency coefficients which all show a significant positive effect on bank ROA. From this observation, it can be concluded that the more efficient a bank is in using

resources and technology, the greater the ROA it will achieve. This increase is due to the increase in Technical Efficiency and reduced operating costs, allowing increased productivity, better competitiveness, and improved overall financial performance.

#### *The Impact of the Interaction between Market Power and Technical Efficiency on ROA*

Significantly positive results seen from the coefficient of LIDX\*TEF (aside from column 5) indicate that when technical efficiency interacts with market power, the effect is significantly positive, where the interaction process contributes to increasing the bank's ROA.

In such instances, market-power acts as complementary or enhancing mediator, where it is able to increase the positive effect of technical efficiency on bank ROA, not offsetting or suppressing it. Meanwhile, column 5 shows no indication of mediation, because the coefficient of LIDX\*TEF is not significant on ROA.

#### *The Impact of LDR (Loan to Deposit Ratio) on ROA*

In Credit Market Channel and Deposit Market Channel analysis (see column 2, 3 & 4), it is proven that the community liquidity created by banks, proxied by LDR being not influential on ROA. However, in Deposit Market Channel column 5, the LDR variable is proven to be influential on ROA. This shows that liquidity-LDR is effective in increasing ROA, assessed from the analysis through the Regional/Provincial Deposit Market Channel.

#### *The Impact of Market Power-LDR on ROA*

Aside from the nonsignificant result seen in column 3, we can observe significantly positive effects from the coefficient of LIDX\*LDR. Mediation is detectable here. The interaction of market power with liquidity-LDR affects ROA significantly (see columns 2, 4 & 5), meaning that the interaction of market-power with LDR on ROA is stronger than when they work separately. In this case, the mediating role of market power is referred to as conditional indirect-only mediation, while the result in column 3 shows that market power cannot mediate the effect of LDR on ROA.

#### *The Impact of IRS (Interest Rate Spread) on ROA*

In the Credit Market Channel and Deposits Market Channel analyses, the IRS coefficient shows a negative effect on ROA (except in column 5). This implies that IRS (Interest Rate Spread) negatively affects ROA, both through the credit channel and the bank deposit channel. This indication also suggests that banks should be particularly prudent in spread management to ensure optimized profitability and strong financial performance. Typically, this condition is caused by declining NIM-Net Interest Margin, pressure on interest income, declining profit margin, declining competitiveness and increasing credit risk.

#### *The Effect of Market Power Interaction with the IRS on ROA*

IRS Variable in the 4th column had initially (before the interaction) showed a negative influence on ROA with the coefficient of = -2.22841\*\*, then, after LIDX interacted with IRS, the impact is still negative on ROA with the coefficient of = -0.05198\*\*. In this context, the market power acts as a mediator in minimizing the negative impact of the IRS on ROA. Meanwhile in the other column the status is “non meditation” because the coefficient LIDX\*IRS is not significant. So, in this case, the process of market power in mediating ITS to influence ROA, is only proven in the analysis via deposits channel (the 4th column) only. where market power in this case acted as “dampening mediation” or “attenuating mediation”. Remember, the coefficient of IRS after interacting with LIDX will be lower (even though it's still negative) if it's compared with the coefficient of IRS before interacting with LIDX.

#### *The Effect of CAR (Capital Adequacy Ratio) on ROA*

In the Credit market channel and Deposit market channel analysis, it shows that CAR had a negative

significant impact on ROA, which means the increase of CAR actually made the ROA decrease. The negative influence of CAR on ROA showed that an increase of reserve requirement had a negative impact on the bank financial performance, which is reflected in lower ROA. This condition happens because there is an increase in reserve requirements, the decrease of ROE (Return on Equity), the decrease of investors' trust.

#### *The Effect of Market Power Interaction with CAR on ROA*

The result was significantly positive on ROA bank. In this case, market power acted as a competitive mediator of CAR variable on influencing ROA. It showed that market power helped to cover the negative CAR on ROA stronger. In other words, the negative of CAR on ROA was recovered by the positive influence of market power on ROA.

#### *The Impact of FBI (Fee-Based Income) on ROA*

In the Credit market channel and Deposit market channel analysis (look at the 2nd and 4th Columns) the FBI variable did not give an effect on ROA, but in the 3rd and 5th columns, the FBI influence on ROA was positive, it proved that FBI on the province level was able to contribute on ROA. The positive impact of the FBI on ROA showed that non-interest income of banks such as administration fee, transaction fee, or other service fee, gave positive effects on the banks' financial performance, which was reflected in higher ROA.

#### *The Effect of Market Power with FBI Interaction on ROA*

The effect was significantly positive. This result showed that when the two factors interact, the effect on ROA becomes stronger than the effect of each of them individually. In this case, market power seemed to act as complementary mediation between the FBI and ROA. This showed that market power strengthened the relations between FBI and ROA in a complementary manner, through the effect on the market and industrial structure.

#### *The Effect of OCB (Overhead Cost Bank) on ROA*

In the Credit market channel and Deposit market channel analysis, the effect of OCB on ROA is significantly negative. The negative effect of OCB on ROA showed the increase of non-interest expenses has a detrimental effect on bank profitability. The high overhead costs can reduce the profitability of banks because most of the revenues are reduced to finance the overhead cost. This condition happens because there are increasing perational costs, declining profit margins, disproportionate growth and increasing financial risk.

#### *The Effect of Market Power Interaction with OCB on ROA*

The result was significantly negative on ROA, as shown in the 2nd and 4th columns. The negative effect from both factors played a role in reducing ROA collectively, however, it was in a smaller intensity compared to the effect of OCB on ROA before interacting with ROA. This showed that market power acted as complementary mediator of OCB variables in influencing ROA. In this context, market power minimizes the negative impact of overhead costs on ROA. On the other hand, the 3rd and 5th column showed no mediation.

#### *The Effect of NPLs Bank on ROA*

The result was proven to be negative in the Credit market channel and deposit market channel analysis; which means that the higher the bad debt rate in the bank portfolio, the lower is the ROA, because the bad debt rate can cause loss for a bank so the bank has to set the fund aside to cover the loss which possibly appears from the default. The negative impact can be associated with several additional factors, including increasing credit risk, declining bank interest rates, higher allowances for default losses, rising collection



fees, and a decline in investor trust.

#### *The Effect of Market Power Interaction with NPLs on ROA*

The result was negative in the 3rd and 5th columns. This showed that when two factors (market power with NPLs) interact, the negative effect of NPLs on ROA is reduced on ROA, by the market power variables. In this case, market power becomes the competitive mediation variable of NPLs in influencing ROA. The positive effect of market power counters the negative effect of NPLs on ROA by balancing via risk management strategy, while in the 2nd and 4th column, the interaction between market power and NPLs did not influence the ROA in banks. There is no mediation.

## Discussion

ROA (Return on Assets) in this research was treated as a dependent variable, acting as an indicator of bank performance. ROA is commonly used for the profitability of international banking including in Indonesia. Phan et al. (2023) and Antao & Karnik (2022) define ROA as the indicator of profitability and bank operational efficiency because it can indicate how efficient a bank is in managing their assets to generate revenue. This opinion is supported by Mehzabin et al. (2023); which stated the profitability calculation with the ROA version presented the holistic evaluation on bank performance because it can integrate the revenue effect, asset utilization and risk management. Therefore, in various high-quality international research, ROA is commonly used as the proxy of company profitability.

#### *The Effect of Market Power on ROA*

Market power in this research used Lerner Index as proxies, which was symbolized as LIDX, with the formula,  $LIDX = (P - MC) / P$ ; market power reflects the ability of companies or industries to influence market price by applying  $P > MC$ . It means, P (price) is set in such a way, so it is more than MC (marginal cost). While the Lerner Index is higher, it means the company has a higher market power. The Lerner Index ranges between 0 to 1, where the higher value shows the bigger market power.

Basically, strong market power from a company originates from sustainable cost-efficiency innovations, which successfully reduce the MC (marginal cost) without reducing the output quality. If the technical efficiency of a company successfully reduces MC significantly, the company's market power increases, generally followed by the increasing market-share, because the company reduces the price/unit (without reducing the product quality, so the percentage of company sales increase is more than the percentage of industry sales increase. In other words, market power is the power resulting from a firm's ability to raise prices above marginal costs (Church & Ware, 2000).

The Lerner Index Level also reflects the market concentration and market competition level. This showed an idea of market dynamics and the company relative power which are included in it. If the Lerner Index is high, it means the market concentration is high, and the competition is low (Hawtrey & Liang, 2008). If the Lerner Index is high, it means the company or industry has a bigger ability to make  $P > MC$  (setting higher prices above the margin cost), which shows a high market power level.

The high market concentration implies that only some companies dominate the market, with a few significant competitors. Because there are only a few significant competitors, the competition in the market is relatively low, because the dominant companies can control the price more easily without worrying about losing a significant market share.

A low market concentration shows that the market consists of many relatively small companies, without a single company which dominates the market. With many relatively small competitors, the competition in the market tends to be high, as all of the companies must compete fiercely to attract the customers through a lower price or better added value.

The analysis results in this research shows market power had a positive effect on ROA, both on credit

market channel and deposits market channel analysis. It means the size of ROA of banks depends on the market condition, the more highly concentrated a market is (the less competitive it is), the bigger ROA can be obtained. This research has been conducted by Schaek & Cihak (2010), Bikker et. al. (2008), and Kabir & Worthington (2017). They proved this lerner index indicator to capture market power in the commercial bank industry.

An interesting part of this research is on the national scale, the effect of market power tends to be lower compared to provincial scale. It showed that at the provincial level, market power of the group of the Regional Development Banks (BPD), has a bigger effect on ROA compared to the national scale. This indicates that at a regional context, the group of Regional Development Banks (BPD) has a higher control on their market, which can influence their financial performance more significantly than in the national level.

When the market power (LIDX) has a positive effect on the ROA of banks, this shows that banks have the ability to determine the interest rate or higher prices which are higher than their margin cost. This can be caused by some factors, including market domination or lack of significant competition, which allows the banks to determine higher prices.

This finding is in line with the SCP theory, because the size of profitability depends on the market concentration. This finding supports the finding of Santoso, D.B., et al., (2023) which studied the relation among banking market structure concentration, competition level and bank profitability in Indonesia which concluded that higher concentration or reduced competition correlates with the increase of banking profitability opportunity.

The other finding which is in line with this research is Alhassan et al., (2015), Cherchye & Verriest (2016), Banerjee & Savitha (2021) dan Tuyet & Ninh (2023) which collectively support the idea of relation between competition intensity and profitability level. They concluded that in the industry with lower competition, companies tend to get higher profit.

Overall, the findings suggested that the competition intensity plays an important role in determining the company profitability in an industry. In a less competitive environment, companies often have the chance to generate higher profit because of several factors, including pricing power, price competition, and higher loyalty.

#### *The Effect of MS-loans on ROA*

The effect of market share on ROA is typically positive. However, in this research, the market-share of loans had a negative effect on ROA. This suggests that applying an aggressive credit expansion strategy increases credit risk or indicates inefficiencies in cost structure.

Inefficiency from credit expansion can be seen from the increasing default risk or the reduced NIM-net interest margin (because the spread is reduced). Besides, the problems in competition, risk management, business strategy, operational efficiency, or changes in the economic environment also trigger this situation. The decrease in the ROA of banks because of the increase in market share of loans also can be caused by the exposure of other risks, such as liquidity, market and adverse selection risks.

There is a connection between this finding and the research of Abbas & Ali (2021) which concluded that banks could expand their credit activities when additional funding sources are available, so the variation of funding pushes the manager to reach a higher credit distribution. In this case Vo (2020) highlighted the need to expand the funding sources in the banks' administration policies, which is really essential to keep the variety of funding and optimize the banks' performances.

Most of the findings in the research are not in line with the theories but in line with the findings of Bushashe (2023) which concluded that the increase of industry-specific factors (market-share assets, deposit, and loan) led to a decline in bank performance. The banks have varied capital levels and very different market

share, so there is no chance for a few small banks to dominate the market.

#### *The Effect of MS-deposits on ROA*

The variation of funding pushes the ability of banks to access the funding from various sources, including deposits, interbank money markets, and capital markets. When a bank has various funding bases, the bank will not be dependent on one source of funding, so that the bank is stronger in facing financial instability.

Market-share of deposits in banks should have a positive impact on ROA, but in this research the ROA was significantly reduced by market-share of deposits (provincial scope), as with the finding by Nguyen (2018) and D. K. Pham et al. (2023) which stated the various funding in banks and profitability correlates positively. On the contrary, in this research, MS-deposits at the national level had a negative effect on the ROA of the banks. It is in line with the findings of Pham et al. (2021); Nguyen (2018), which stated that keeping various funding sources with high costs reduces the profitability of commercial banks.

The development of market share of deposits (third party funds) in the national scope has the potential to reduce ROA. This indicates that when banks focus too strongly on increasing MS-deposits, the effect actually becomes negative on ROA. This condition can be caused by the increasing cost of funds or the decline of funding usage efficiency. This indicates that there are problems in market competition, business strategies, risk management, operational efficiency and changes in customer preferences.

#### *The Interaction of Market Power with Market Share on ROA*

In this research, the market power successfully mediated market-share on ROA. In MS-Loan, which had a negative effect on ROA at first, changed after the market power was added. The result showed that the effect of interaction became positive on ROA. This result shows there are additional benefits from the interaction. The additional benefits obtained by banks originated from the improved ability of banks to control the market. This can happen through enhanced operational efficiency, better risk management, offering additional service, increased customer loyalty or product diversification and innovations.

In addition, the interaction between market power and MS-deposits-national on ROA, also initially had a negative effect on ROA. However, after interacting with market power, the effect became positive. When the market power increases, the negative effect from market-share deposits which had a negative value was covered by the positive effect of market power so that the overall interaction effect became positive on ROA of banks. This showed that there are competitive mediations where market power influences market-share on ROA which when it is the turn, it can influence market dynamics and the competition result.

For the interaction between market power and MS-deposits-province on ROA, the market-share of deposits initially had a positive effect. Then, after interacting with market power, the effect was still positive. It showed synergy. When the market power increases, the positive effect of market power synergizes with the positive effect of market share deposits to increase the ROA of banks. This indicates that there is complementary mediation because of synergy.

#### *The Effect of Technical Efficiency of Banks on ROA*

Technical efficiency is important for banks because it is helpful for performance measurement, relative efficiency identification, operational improvement, strategic decision making, and competitiveness. So, technical efficiency can be a valuable instrument for banks to understand and improve the banks' performances.

In this research the technical efficiency variable (which was measured by DEA-method) has proven to have a significantly positive effect on ROA in all of the analysis paths. This shows that bank innovation in technical efficiency is important for bank competition strategy. This is because the effect of innovation-technical efficiency from banks will lead to a lot of benefits such as increased operational efficiency, adaptation to market changes, increased service quality and development of new products and services.

This research is in line with Alhassan, et al., (2016) which conclude that there is a positive correlation between technical efficiency and profitability, consistent with ESH (Efficiency Structure Hypothesis-Theory).

Besides, the interaction of market power with technical efficiency on ROA is positive. This shows that market power is able to mediate in the sense of supporting the effect of technical efficiency of banks on ROA. This shows that there is synergy from the interaction in improving the bank financial performance.

The positive synergy in high market power strengthens the positive effect of technical efficiency on ROA. This synergy occurs because with market power, banks are more capable of controlling prices and efficiency, optimizing funding and the utilization of resources, improving market penetration, making innovation and product development, and also reducing risk and volatility.

#### *The Effect of LDR (Loan to Deposit Ratio) on ROA*

Theoretically, the effect of LDR on ROA should be positive. However, in this research the positive effect was just obtained in the pathway of the deposits market at the provincial level. At the provincial level, banks' efforts to mobilize funding by collecting community funds contributed significantly to improving banks' performance. However, this relationship was not reflected at the national level, where such efforts do not contribute significantly. Similarly, the effort to mobilize funding in credit distribution did not have a significant positive effect on ROA performance of banks.

This finding supports the research of Chhetri (2021) which concludes that banks with higher LDR are not always profitable. However, Duan & Niu (2020) concludes that liquidity creation on the asset side correlates negatively with profitability, however the liability-side and off-balance sheet liquidity creation correlates positively with profitability.

Moreover, Abbas et al. (2019) demonstrated that the effect of asset-side liquidity on commercial banks in developed countries in Asia is positive. Major banks generate more profit from improvements of asset liquidity compared to medium and small-sized banks. In addition, V. T. Tran et al. (2016) also concluded that banks often experience lower profitability when they maintain high levels of liquidity as this reduces the volume of credit provided. As a result, they tend to have lower net profit and sales. In this research, there are some possibilities that cause these conditions, such as strategic priority changes and complex market conditions.

In this case, the effects of market-share of loans/deposits that were negative on ROA of banks also played a role in blurring the effect of LDR. Because, if the market-share of loan and deposits have a more dominant or significant negative effect on ROA in the actual situation, the effect of LDR becomes minimally relevant on ROA. Besides that, the competition in credit and deposit markets can also have a significant influence, because highly competitive markets make NIM very low, so that its increase does not have a noticeable impact on ROA, because the changes of NIM do not significantly improve bank operating incomes.

The interaction of market power with the liquidity ratio LDR. Overall, there is a synergy between the liquidity ratio LDR and ROA. At first, the LDR variable does not have an effect on ROA, but after LDR interacts with market power, the overall effect becomes positive on ROA. This interaction generates high and beneficial energy so that it results in funding optimization, better risk management, increased credit activity, improved customer trust, and higher operational efficiency.

#### *The Effect of the IRS on ROA*

The banks' IRS (interest rate spread) reflected the difference of value between LR (lending rate) and DR (deposit rate). Higher IRS potentially generates higher profit, and the other way around. Karki (2020) stated that lower IRS leads to a lower profit, so, as a result, the banks try to allocate their funds to the areas with higher interest while also keeping the default risk low to maximize the profit and shareholder wealth (Musah et al., 2018). In traditional banking, IRS is considered as the main income of banks, so its relationship with

profitability is normally positive (Musah et al., 2018; Karki, 2020). This implies that when a bank's IRS increases, the profitability tends to increase, both moving in the same direction.

Although the IRS is theoretically expected to be positive on ROA, this research statistically demonstrated that the IRS had a significantly negative effect on ROA. This is common in highly competitive environments where a declining IRS-spread causes Net Interest Margin (NIM) per unit to be smaller. To counteract this decline, banks seek to improve the credit volumes so that the NIM is high in total, so that it helps maintain their operating incomes remain.

#### *The Effect of Interaction between Market Power and IRS on ROA*

The interaction between the market power with IRS on ROA showed there was a benefit or positive effect (look at the 4th column). Even though IRS without interaction had a negative effect on ROA, the interaction with market power could reduce the negative effect on ROA. The causes are better risk management, income diversification, higher operational efficiency and product and service innovation. This only happened in the analysis of national level deposit lines, the other lines showed no mediation.

#### *The Effect of CAR on ROA*

CAR (Capital Adequacy Ratio) is an important indicator of the financial strength of a bank and its compliance with regulation. A high CAR shows that a bank has enough capital to be a shock-absorber from loans and protect itself from default due to lack of funds (Chhetri, 2021). Besides, the banking industry with a high CAR shows high ability to pay for financial obligations and depositor demands, and the financial system becomes healthier and more stable, Ajayi et al. (2019).

In normal condition, CAR variable has a positive effect on ROA, because high CAR is an indicator of an improved ability of the bank to manage risks. However, in this research, CAR had a negative effect on ROA. This condition was caused by inefficiency of the use of capital, increasing additional costs in fulfillment of CAR requirements, the low quality of assets, and competition in the financing market within the bank.

#### *The Effect of Interaction between Market Power and CAR on ROA is Significantly Positive.*

Logically, this condition can happen because the bank has better ability to set higher prices, there is more effective portfolio diversification, ability to manage risks effectively, greater operational efficiency and higher market trust. Those factors counteract the negative effect of CAR on ROA. Banks with higher market power handle the financial challenge more flexibly and maintain the strong financial performance even though facing a higher capital requirement.

#### *The Effect of the FBI on ROA*

The research results showed the effect of FBI (Fee Based Income Bank) on ROA is significantly positive, on a regional level. It means, the banks successfully applied an income diversification strategy. The more efficient the FBI management is, the greater the FBI portion in bank revenues so that its contribution to ROA is bigger. Banks with the ability to develop and offer a lot of fee-based products and services will have better chances to maintain their income stability and increase their profitability as well as their ROA in a dynamic market.

In the condition of the increasingly competitive credit markets, the FBI has a significant role in the banks' income stability. Because the innovation in income diversification makes the bank stronger to survive and compete. In bank management, the FBI can create revenue stability, reduce risks, increase profitability, better competition, improve adaptability and make the banks more responsive to the market changes.

In this research, the effect of the FBI on ROA is positive on a regional level. It aligns with the finding by Abu Khalaf, et al (2024) which conclude there is correlation between FBI and bank performance. It is also

consistent with the finding of Stanley & Muturi (2023) which observed the performance of all banks in Kenya, where the collected proofs showed that there was a positive relationship between FBI and profitability. Besides, Ferreira (2019) sees that income diversification also had a positive effect on banks in Brazil.

On the contrary, this finding doesn't align with Phan et al. (2023) who focused on the effect of FBI in ASEAN regions, as well as with Meslier et al. (2014); Salike & Ao (2018); dan Phan et al. (2023) which found that FBI had a negative effect on ROA. Meanwhile, in the findings of Park et al. (2019) which evaluated the effect of the FBI on the overall performance of all banks in the US. The finding showed that the FBI had no effect on the profitability of banks in the US.

#### *The Effect of Market Power Interaction and FBI on ROA*

The result of analysis via market deposits and credits in this research showed that there was a positive effect of the market power interaction with the FBI on ROA. This shows that there is synergy from the interaction. The increase of ROA happens because there is a synergy of market power and FBI because there is something underlying it. The reasons are the banks are able to control the market, create innovation, maintain customer loyalty, improve operational efficiency and synergized strategic partnerships.

#### *The Effect of Overhead Cost Bank on ROA*

Antwi (2019) stated that management is required to apply an effective system in managing overhead costs because the more efficient the bank's overhead costs are, the better its performance will be. In this case, Sufian & Chong (2008), and Flamini et al. (2009) also supported the theory by stating the higher OCB, the lower its performance will be.

In this research, the effect of OCB (overhead cost bank) on ROA was negative. It means the more effective OCB management; the greater ROA bank will be. This showed the innovation in operational cost efficiency (OCB) is an important factor in maintaining and increasing the bank ROA, especially in the increasingly competitive credit and deposit markets.

Accordingly, the innovation in operational efficiency is the key in survival and competitive strategies for banks in the increasingly competitive credit and deposit markets. Banks that are able to manage their operational costs effectively will have better chances to improve their profitability and maintain or increase ROA by higher

operational efficiency, income diversification, increasing profit margins, and seeking additional efficiency. This makes it possible for banks to take advantage of market power to counteract the negative effect of OCB financial performance.

#### *The Effect of NPLs on ROA*

Trade-off Theory, as discussed by Bolarinwa, et al. (2021) proposed a balance between NPLs (non-performing loans) and bank performance. Even though NPLs can hinder the efficiency of bank operations, it is possible that banks will prioritize profit optimization through their credit growth as noted by Sufian (2012). This is different from Dao, et al. (2020) who suggested banks set aside extra reserves in handling problems related to NPLs if they cannot control NPLs completely.

The research which investigated the effect of NPLs on bank profitability gave varying results, where Sufian (2012); Larye, et al. (2016) concluded that NPLs had a positive effect on ROA. This shows the complexity of the relationship between credit risk and bank financial performance, which can be affected by several factors such as risk management strategy, economic condition and industrial structure.

Whereas in this research, the effect of NPLs on ROA was negative, it means the lower NPLs are, the bigger bank ROA will be. This finding supported the findings of Vinh (2017); Karim, et al. (2010); Dao, et al.

(2020) who concluded that the relationship of NPLs and bank performance is negative.

In this case, the banks which can manage the risks well and keep NPLs at a low level will have a better chance to keep or increase their ROA, and also to survive and succeed in competitive markets.

#### *The Effect of Market Power with NPLs on ROA*

The result showed that there was a mediation process from market power variables. Market power was able to strongly balance the negative effect of NPLs on ROA. This process of synergized interaction happened because the banks with higher market power have higher ability to manage credit risk better, minimize NPLs, apply an effective billing process, build strong reputation in the market and access additional financial resources.

### **Conclusion**

From the analysis and discussion result, it can be concluded that market power variables have a positive effect on profitability. The market share of the loan variable, which was expected to have a positive effect, actually had a negative effect. Both findings showed that the credit market in the Regional Development Banks (BPD) group still applies to the traditional SCP-Theory and has not managed product diversification efficiently. The same case also happened in the market share of deposits variables (studied nationwide), on the contrary, when it was analyzed from market share of deposits variable (analyzed regionally), the management of credit product diversification has been efficient.

The internal variables which positively contribute to profitability are technical-efficiency, fee-based income and liquidity-LDR at the regional level. Meanwhile the other variables such as interest rate spread, capital adequacy ratio, overhead cost bank and non-performing loans have a negative effect on the bank profitability.

The important role of market power with profitability performance becomes clearer when it is combined and interacted with the other internal variables of banks. Overall, the interaction between market power and internal variables proven to give significant benefits. The positive effect of market power becomes a synergy which strengthens the variables that were initially positive, balances the variables that were initially negative and promotes variables that were previously insignificant in influencing bank profitability.

The review of the analysis and discussion result showed that market power variable have a significant positive effect on the bank profitability, while market share of loan and market share of deposits variable (studied nationwide) showed a negative effect, demonstrating that credit market in Regional Development Banks (BPD) group still applies the traditional SCP theory and has not been efficient in managing product diversification. However, if it is viewed from the market share of deposits variable (analyzed regionally), the management of product diversification has proven to be more efficient.

Besides, it was also found that internal variables such as technical efficiency, fee-based income, and liquidity-LDR in regional level had a significant positive contribution in the bank profitability. However, the other variables such as interest rate spread, capital adequacy ratio, overhead cost bank, and non-performing loans had a negative effect on profitability.

The importance of market power on the bank profitability performance is clearer when it interacts with the other internal bank variables. This interaction has proven to give a significant benefit, where the positive effect of market power increases the positive effect of other variables, balances the negative effect of other variables and generates an effect on the variables which did not significantly influence the bank profitability.

Therefore, this finding shows that the bank strategies in maintaining or increasing their market power can have a significant role in increasing their profitability, especially when these strategies are integrated with other internal bank variables. In conclusion, this research gives valuable knowledge to banks in planning their strategies to reach their optimal profitability.

Furthermore, this finding shows that Regional Development Banks (BPD) have successfully used their market power to counteract negative influence from the control variable and also optimize the cooperation between additional control variables with market power to increase ROA. This shows the importance of strategies which are adapted to the market condition and bank internal power to achieve better financial performance.

### Implications

In the future, the competitive strategy needs strong market power. Market power should necessarily be the banks' superiority to reach the goal of banks which are reaching adequate profitability, and in the long term, it can maximize the value of firms.

Market power innovations with inward integration and adaptive to the outside with the market and environment changes are extremely needed. Therefore, making the Regional Development Banks (BPD) based on digitalization is a must. This is because all of the transactions have gradually led to digitalization. Furthermore, Regional Development Banks (BPD) are financial providers in regions where all financial service providers must be done digitally. This is a new challenge for the Regional Development Banks (BPD) which have not developed digitalization because it is really important for the future. The digital transformation will make the Regional Development Banks (BPD) in a different area with other banks. Therefore, we need large budgets in the form of CAPEX (Capital expenditure) and OPEX (Operating expenditure).

Considering the financial performance consistency of Regional Development Banks' market share are supported by the regional government, Regional Development Banks (BPD) need to expand their market so their financial service can reach wider scale, so the Regional Development Banks (BPD) will always be the regional economy's driving force. By using digitalization as their base, the banks' market power can innovate faster and improve cost-efficiency so that interest rate spread, capital adequacy, overhead cost can expand the market share of loan/deposits and more synergize with the development of market power which is adaptive to the market changes.

Internal management needs to formulate comprehensive strategies to strengthen the market power of Regional Development Banks (BPD) through digitalization and technology. Additional elements that could strengthen the strategy of Regional Development Banks (BPD) to increase their market power are as follows:

- **Human Resource Development:** Other than investments in technology and digital infrastructure, it is important to make sure the human resources in Regional Development Banks (BPD) have the adequate skills and knowledge to manage the changes which are created by digitalization. Employee training and development in technology and digital services can be the key success in applying the strategy.
- **Enhanced security and Data Protection.** With the increase of digital banking activities, the safety and protection of data become extremely essential. Regional Development Banks (BPD) need to invest sufficient resources in cybersecurity technology and the right policy to protect sensitive customer information and prevent cyber-attacks.
- **Strategic partnership with Fintech:** Regional Development Banks (BPD) should explore strategic partnership options with fintech companies to enhance innovation and offer more advanced services to the customers. This collaboration could involve developing digital banking applications, digital payment services or financial solutions based on blockchain technology.
- **Strengthening risk management:** In tackling fast market and environmental changes, risk management becomes a key. Regional Development Banks (BPD) need to have strong and responsive risk management to identify, evaluate and manage risks related to digitalization and



innovations.

- **Enhancing Inclusive Financial Services:** By expanding the banks' access through digitalization, Regional Development Banks (BPD) can better serve market segments that have been underserved or not effectively handled in the past. This initiative not only will support business growth, but also promote financial inclusion and regional economic growth.

By effectively implementing these strategies, Regional Development Banks (BPD) can enhance their market power, improve their profitability and expand their positive impact as a driving force of the regional economy. It is crucial for them to monitor the market and technological development and to adapt their strategies flexibly in response to changes.

### Recommendations

Based on research findings, there are some suggestions for future research. It is expected that there will be deeper research related to product diversification of credit products in Regional Development Banks, so in future studies the comparison between regional and national can be discussed in a more detailed way and more relevant policies about credit management can be implemented to improve efficiency.

Furthermore, related to the model development that has been conducted, future research can develop interaction models with various variables to increase profitability, which is affected by internal variables and market power in a more complex manner. The methods that can be used are Structural equation Modeling (SEM) or regression with interaction so that the invisible trade-off in the simple method can be analyzed in a more detailed manner. This can also increase profitability based on better strategy design in the context of a more competitive credit market.

Besides that, in this research Fee-Based Income, Liquidity (LDR) and Technical Efficiency have a positive relationship with profitability. It is hoped that future research can add other variables that have not been analyzed such as technological innovations, human resources, and risk management, to expand the research into other internal factors. With these suggestions, further research can make a better contribution based on several factors, such as product diversification, market power, and internal variables affecting the profitability of Regional Development Banks (BPD).

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