

MARKET CONCENTRATION, PRICE DYNAMICS, AND PROFITABILITY IN INDONESIAN BANKING: AN EMPIRICAL INVESTIGATION

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ABSTRACT

This research delves into Indonesia's banking sector's competitive landscape, examining bank mergers' effects on performance through the Structure Conduct and Performance (SCP) hypothesis. By reshaping market structure, bank mergers influence subsequent bank behavior and performance. The findings highlight a discernible pattern: an uptick in market concentration accompanies a decline in prices within the banking sector. This implies that mergers often yield economies of scale, enabling banks to offer more competitive rates. However, this reduction in prices directly impacts bank profitability. Moreover, the concentration ratio, a pivotal metric in market analysis, emerges as a significant gauge of industry competition. Serving as a structural measure of competition, the concentration ratio depicts the market share held by leading banks. Intriguingly, diminished competition, as indicated by higher concentration ratios, correlates with decreased profitability for banks operating within this framework. This exploration of Indonesia's banking sector reveals a nuanced interplay between market structure, bank conduct, and overall performance. Through the SCP hypothesis, the study elucidates how seemingly routine bank mergers can trigger a cascade of effects, influencing market dynamics, profitability, and competitive positioning. Based on thorough analysis, the study furnishes strategic insights for policymakers, industry stakeholders, and the banking community, offering a comprehensive understanding of the ramifications of market shifts and guiding strategies to navigate Indonesia's banking landscape adeptly.

Keywords: Banks, Structure Behavior and Performance (SCP), Competition, CP 4, HHI, Mergers, Managerial Economics

ABSTRAK

Penelitian ini menggali struktur kompetitif sektor perbankan Indonesia, menganalisis dampak dari penggabungan bank terhadap kinerja melalui Hipotesis Struktur Perilaku dan Kinerja (SCP). Dengan merekonstruksi struktur pasar, penggabungan bank memengaruhi perilaku dan kinerja bank selanjutnya. Temuan menunjukkan tren yang mencolok: peningkatan konsentrasi pasar seiring dengan penurunan harga di dalam sektor perbankan. Hal ini mengimplikasikan bahwa penggabungan seringkali menghasilkan ekonomi skala, memungkinkan bank untuk menawarkan tarif yang lebih kompetitif. Namun, penurunan harga ini secara langsung memengaruhi profitabilitas bank. Selain itu, rasio konsentrasi, sebuah metrik penting dalam analisis pasar, menjadi indikator signifikan dari persaingan industri. Berfungsi sebagai ukuran struktural persaingan, rasio konsentrasi menggambarkan pangsa pasar yang dimiliki oleh bank-bank teratas. Menariknya, persaingan yang berkurang, sebagaimana ditunjukkan oleh rasio konsentrasi yang lebih tinggi, berkorelasi dengan penurunan profitabilitas bagi bank yang beroperasi dalam konteks ini. Penelitian ini terhadap sektor perbankan Indonesia mengungkap interaksi rumit antara struktur pasar, perilaku bank, dan kinerja keseluruhan. Melalui hipotesis SCP, penelitian ini menjelaskan bagaimana penggabungan bank yang tampaknya rutin dapat memicu serangkaian efek, memengaruhi dinamika pasar, profitabilitas, dan posisi bersaing. Berdasarkan analisis yang teliti, penelitian ini memberikan wawasan strategis bagi pembuat kebijakan, pemangku kepentingan industri, dan komunitas perbankan, menawarkan pemahaman komprehensif tentang dampak perubahan pasar dan membimbing strategi untuk menavigasi lanskap perbankan Indonesia dengan cermat.

Kata Kunci: Bank, Struktur Perilaku dan Kinerja (SCP), Persaingan, CP 4, HHI, Penggabungan, Ekonomi Manajerial

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INTRODUCTION

The Structure-Behavior-Performance Hypothesis (SCP) is an economic theory that examines the intricate interplay among market structure, firm behavior, and firm performance (Bain, 1951; Martin, 1988). It serves as a valuable analytical tool to dissect and understand the behaviors of companies across diverse market landscapes. According to the SCP hypothesis, the configuration of a market significantly influences the conduct of its constituent firms (Jaya et al., 2008). In concentrated markets dominated by a few firms, competition often diminishes, leading to possible collusive practices among firms. Conversely, intense price competition and a drive toward innovation emerge in more competitive environments with numerous more minor players. Consequently, the behavior of firms plays a crucial role in shaping their overall performance. A more competitive stance typically results in superior performance, with firms striving to offer better products at competitive prices.

While the SCP hypothesis provides insights into the influence of market structure and government interventions on market behavior and outcomes (Belangkaehe et al., 2014), it is essential to acknowledge its limitations in encapsulating the nuanced dynamics of markets (Ramadhan, 2017). The SCP hypothesis is instrumental in deciphering the interaction among market structure, bank behavior, and bank performance (Suhel, 2015). Factors such as the number and size of banks, barriers to market entry and exit, and the level of market concentration constitute the architecture of the banking sector. Bank behavior encompasses the strategies and tactics banks adopt in the competitive arena, while bank performance metrics include profitability, efficiency, market share, stability, and customer satisfaction.

This article explores bank behavior, examining banks' market structure (concentration) and economic performance (profit) within the Indonesian banking system through the SCP framework. Given the banking sector's pivotal role in financial and economic development, SCP analysis within the banking domain assumes paramount importance. Firstly, analyzing market structure and bank behavior facilitates a deeper understanding of their intricate relationship (Bhatti & Hussain, 2010). For instance, comprehending how market structure influences bank conduct helps identify potential issues related to unfair competition or inefficiencies within the banking sector. Furthermore, SCP analysis aids in evaluating bank performance by considering various metrics such as profitability, efficiency, market share, stability, and customer satisfaction (Bikker & Haaf, 2002). Through the SCP framework, an impartial assessment of banks' effectiveness and efficiency in achieving their objectives becomes feasible.

Furthermore, delving into bank SCP analysis offers valuable insights into the influence of government policies on market structure and bank behavior (Carlson et al., 2022). Regulatory frameworks, competitive stances, and economic incentives significantly impact market dynamics and bank conduct. Therefore, SCP analysis provides a mechanism to assess the implications of government policies on bank performance and efficiency, thereby identifying opportunities for policy enhancements. Lastly, bank SCP analysis equips banks with strategic foresight for decision-making and planning (Nurenberg, 1998). By understanding the relationship between market structure, bank conduct, and performance, banks can identify opportunities to enhance efficiency, expand market reach, and elevate overall performance (Evan, 1988). This aids banks in formulating superior strategies to compete effectively and achieve sustained profitability.

In the broader context of ensuring the stability and sustainability of the banking sector while striving for broader economic objectives, regular SCP analysis within banking proves to be of utmost

significance. Through this analytical prism, potential pitfalls can be identified, effective regulations can be formulated, and the quality of services rendered by banks to customers and society can be comprehensively enhanced (Ramadhan, 2024).

LITERATURE REVIEW

Indonesia's banking sector grapples with challenges hindering its intermediation function, evidenced by a decline in the Loan Deposit Ratio (LDR) from 90% to 80% (*Otoritas Jasa Keuangan (OJK), 2021b*), an uptick in the Non-Performing Loan (NPL) ratio from 2.93% in 2022 to 3.31% in 2021 (Bank Indonesia, 2022), and a dip in the Net Interest Margin (NIM) from 5.63% in 2022 to 4.66% in 2021 (OJK, 2021b). These trends propel banks to vie for enhanced performance and an expanded customer base. Competing in the banking landscape entails offering enticing interest rates, incentives, promotional offers, and innovating new products and services buoyed by technological advancements to curtail production and distribution costs (Schaeck et al., 2013).

Nonetheless, an atmosphere of excessive competition can yield negative repercussions, including the abuse of market dominance. According to Kim (2022), banks wielding substantial market clout tend to undertake heightened liquidity risks, hinting at how reduced competition levels may render the financial system more vulnerable. Indonesia's economy weathered a storm during 1997-1998, catalyzed by the liberalization of its banking sector through policy packages in 1983 (*Paket Kebijakan Juni, PAKJUN*) and 1988 (*Paket Kebijakan Oktober, PAKTO*). This liberalization surge saw Indonesia's bank count soaring to 208 banks (Naylah, 2010), prompting the necessitation of the Indonesian Banking Architecture (*Arsitektur Perbankan Indonesia, API*) aimed at consolidating commercial bank capital. Consequently, this policy overhaul brought about a noteworthy shift in bank numbers, plummeting from 208 banks in 1998 to 121 banks by December 2009 (Prasetyo & Sunaryo, 2015).

Amidst the banking sector's tumult and the regulatory constraints impeding its fluidity, banks potentially gravitate towards forming imperfect competitive markets, trending towards oligopoly. In such a milieu, clandestine cooperation surfaces to fortify their market standing. This covert cooperation is evidenced by indicators like the control of market share by select bank cohorts such as Privately Owned Commercial Banks (*Badan Usaha Milik Swasta, BUMS*) and State-Owned Commercial Banks (*Badan Usaha Milik Negara, BUMN*). As per the Interbank Market Interest Rate (SPI), these two bank groups command a market share of Third-Party Funds (*Dana Pihak Ketiga, DPK*) at 45.38% and 41.55%, respectively (*Otoritas Jasa Keuangan (OJK), 2021*). Corporations boasting substantial market share are often deemed dominant business entities capable of molding market prices via heightened production (Lubis et al., 2017). The Law Number 5 of 1999 concerning Prohibition of Monopolies and Unfair Business Competition (1999) stipulates that a single business entity or a group is labeled a dominant business entity if they hold sway over 50% or more of the market share of specific goods or services, or if two or three entities or groups control 75% or more of the market share of goods or services.

With a commanding market share, banks can transcend the role of price takers to become price setters, wielding substantial market power. This dominion can either rest with a singular entity, termed a monopoly or be shared among multiple entities, termed an oligopoly, wherein they leverage their dominance for anti-competitive maneuvers. Furthermore, consolidation policies loom as potential catalysts for market concentration. The Financial Services Authority Regulation Number 12/POJK.03/2022 concerning Commercial Bank Consolidation, on the one hand, may impede fresh entrants into the market, curtail the existing competitor count, and consequently concentrate market

power within existing banks. After the implementation of the Indonesian Banking Architecture Program (API) (consolidation), bank numbers dwindled, with the current operational tally standing at 107 banks (OJK, 2021a).

Furthermore, the nexus between high credit interest rates and meager deposit interest rates cannot be ignored. Considering the foregoing, consolidation policies may spur market concentration and foster monopoly power among a select group of banks, adversely impacting customers as these banks might peg high credit interest rates against low deposit rates (Silalahi et al., 2015). Banks strive to sustain a substantial Net Interest Margin (NIM) in the Indonesian banking landscape. NIM is a pivotal metric, calculated as the ratio of net interest income to productive assets (Prasetyo & Sunaryo, 2015). The wider the spread or differential between bank interest rates, the greater the bank's earnings potential. According to data from OJK (2021a), Indonesian banking spreads hovered between 4-6% throughout 2021 to 2021.

However, banks did not adjust credit interest rates proportionally in response to the reduction in the benchmark interest rate (BI 7-Day Reverse Repo Rate, BI7DRR). The decrease in the Prime Credit Interest Rate (*Suku Bunga Dasar Kredit, SBDK*) by 174 basis points (bps) during the period from March 2022 to March 2021 was only mirrored by a 59 bps (year-on-year) decrease in new credit interest rates. In an environment where credit interest rates remain high and deposit interest rates are low, the availability of funds that can be channeled into credit becomes limited, thus disrupting the bank's intermediation function.

Due to collusion or monopolistic behavior, concentrated markets yield higher profits for companies, irrespective of their efficiency levels (Lloyd-Williams et al., 1994). Hence, it becomes imperative to conduct further assessments of the level of banking competition in Indonesia to ensure that the competition adheres to the provisions of Law No. 5 of 1999 concerning the Prohibition of Monopolies and Unfair Business Competition. This is crucial to uphold a healthy competitive climate and ensure the banking system's stability.

Two prevailing structural hypotheses are often utilized to derive insights into the relationship between banking industry structure and profitability within the organizational literature (Berger, 1995; Allen & Gale, 2004; Uzunidis, 2016). These are the traditional Structure-Behavior-Performance (SCP) or simply Structure Performance Hypothesis (SP), and the Efficient Structure Hypothesis (ESH) (Berger, 1995; Uzunidis, 2016).

The SCP hypothesis posits that the banking market's structure determines the banking firms' behavior, subsequently influencing their performance in the market (Bain, 1951 & 1956). This hypothesis underscores market forces to delineate the structure and performance of the banking industry holistically (Berger & Hannan, 1989). In essence, it argues that the concentration level within an industry exhibits a negative correlation with the degree of competition and a positive correlation with firms' profitability (Dacanay, 2002). This implies that banks can attain higher profits in a concentrated banking industry irrespective of their efficiency (Dang & Do, 2018).

Moreover, banks operating within concentrated banking markets are purported to garner increased profits through noncompetitive practices. The traditional SCP hypothesis, also termed the collusion hypothesis, suggests that concentration in the banking market heightens the propensity of banks to

collude, thereby setting higher prices to augment profits (Sathye, 2005). In concentrated markets, the smaller number of banking firms facilitates easier negotiation and coordination among banks, thereby elevating interbank interdependence (Coccoresse, 2014). Consequently, banking firms within a concentrated banking industry wield greater market power via collusion, enabling them to set prices above marginal costs in contrast to competitive banking markets where prices closely align with marginal costs (Carlton & Perloff, 2000). Setting prices above marginal costs enables banks to amass higher profits, underpinning one of the core arguments for a structuralist approach to antitrust policy (Carter, 1978).

In contrast to the SCP hypothesis, the Efficient Structure Hypothesis (ESH) directs attention toward the efficiency of banking firms rather than their market power. ESH provides an alternative lens to understand the relationship between structure and performance, positing that banking efficiency in competitive banking industries heightens bank profitability, consequently leading to increased market concentration. This dispels the notion of a direct relationship between market concentration and profitability, indicating that efficiency and performance share a direct correlation (Adhamovna, 2016).

Within competitive banking markets, more efficient banks can optimize profits by maintaining price levels while downsizing their operations or reducing prices while expanding their reach (Beck et al., 2011; Mamatzakis et al., 2005). Moreover, their adept management strategies and superior production capabilities allow them to operate at lower costs (DeYoung & Roland, 2001). In turn, these efficient banks can compete vigorously in the market, secure a more significant foothold in the banking landscape, and subsequently generate higher profits, thereby bolstering market concentration (Claessens & van Horen, 2012).

Criticism of the Structure-Behavior-Performance (SCP) hypothesis primarily revolves around the intricate relationships among its components. Critics contend that the hypothesis fails to adequately address the complex interplay between market structure, behavior, and performance, often viewed as deterministic, linear, and descriptive rather than analytic (Pruteanu-Podpiera et al., 2016). The SCP hypothesis treats structure as an independent variable influencing behavior and performance, disregarding exogenous factors such as government regulations that can also significantly impact structure, behavior, and performance (Mishra & Sahoo, 2020).

Despite its criticisms and shortcomings, Seelanatha (2010) proposes that the SCP Paradigm holds two general benefits when used as an industrial organization analysis tool. Firstly, it outlines how an industry functions by incorporating various variables such as barriers to entry, market concentration, and product differentiation to elucidate the constraints and expansions of a firm's operations within the industry. More specifically, it elucidates a company's productivity and efficiency in the market based on these variables. Secondly, the SCP paradigm underscores the rationality of companies as economic actors within an industry. For instance, it posits that companies strategize and adapt their behavior concerning the market environment to optimize their profits.

Several variant hypotheses have emerged to address the limitations of the traditional SCP hypothesis, including the Quiet Life Hypothesis (QLH) and the Relative Market Strength Hypothesis. The Quiet Life Hypothesis (QLH), a specialized form of the SCP hypothesis, posits primarily that market concentration reduces efficiency, consequently leading to lower performance (Mamatzakis et al., 2005). Thus, the QLH suggests a negative correlation between concentration and efficiency. Furthermore, the QLH diverges from the SCP hypothesis by asserting that market concentration results in reduced

performance. According to the QLH, in concentrated banking markets where firms possess relatively high market power, managers exhibit less incentive to maximize efficiency, resulting in diminished performance (Khemani, 1998). Managers are said to be content with a “quiet life,” and banks are expected to yield higher profits in such concentrated markets. Conversely, managers aim to enhance their standing in competitive banking markets due to competition with other banks, rendering banks more risk-averse in concentrated banking industries than competitive ones. In this scenario, industrial concentration and efficiency are inversely proportional to profitability (Jansen & Haan, 2011).

Additionally, there are studies proposing modifications and developments to the SCP paradigm. For instance, Katib (2004) emphasized that market conditions, mainly information, are critical in shaping intermediaries’ structure, behavior, and financial performance. Therefore, the SCP approach in analyzing the banking industry should be revised to encompass market imperfections such as information asymmetry, uncertainty, and transaction costs, as these imperfections significantly impact critical elements of the SCP framework. Another critique of the traditional SCP paradigm in industrial organizations is its assumption that high concentration levels weaken market competition. However, proponents of the New Empirical Industrial Organization (NEIO) challenge this assumption by positing that concentrated industries can exhibit vigorous competition if contestability or credible threats of entry and exit of firms are present (Coccorese, 2014). According to NEIO, competition does not necessarily entail a negative relationship with concentration. NEIO has garnered popularity in empirical applications of industrial organization analysis in recent decades, although the SCP framework continues to dominate the industrial organization literature (Bayangos, 2021).

Numerous studies have endeavored to establish a link between the structure of the banking industry and its performance, particularly profitability. However, the authors present varying results and findings. For example, Nabieu (2013) and Bhatti and Hussain (2010) posit that high concentration positively impacts bank profitability under the SCP framework. It is also suggested that increased concentration results in diminished competitive outcomes and the emergence of supernormal profits experienced by banks.

In the context of the Gulf Islamic banking system, Al-Muharrami et al. (2006) utilized the Structure-Behavior-Performance (SCP) paradigm, revealing a direct relationship between market concentration and stock markets with banking performance. Interestingly, this finding deviates from the expectations of both the SCP and efficient structure hypotheses. Their study highlighted that only a few banks within Iran’s Islamic banking industry “obtain the highest share of profits and maintain their market share by colluding with each other,” indicating an oligopoly or cartel-like banking structure. This aligns with economic logic, as a market controlled by a handful of entities signifies an oligopolistic environment. Even with numerous banking entities in the market, competitive dynamics are dampened if only a few wield substantial control.

Conversely, Sahile et al. (2015) delved into the application of the SCP paradigm within Kenya’s banking sector. Their findings showcased a positive correlation between market concentration, bank market share, and banking performance in profitability. They argue that as banks expand their reach, their performance, particularly profitability, also shows an uptick. Similarly, Samad (2008) uncovered a notable positive correlation between cost efficiency, scale, and profitability in Bangladesh’s banking sector, supporting the efficient structure hypothesis. However, their study refuted the SCP hypothesis, revealing no statistically significant relationship between market concentration and profitability.

Additionally, they found that a company's market share was inversely linked to bank profits, thereby rejecting the Relative Market Power (RMP) hypothesis.

In a different examination, Carletti and Hartmann (2002) explored European Union banking, challenging the applicability of the SCP paradigm. Contrary to expectations, they discovered a causal relationship where banking sector performance influenced banking concentration rather than the reverse. Furthermore, their analysis unveiled an inverse correlation between market concentration and performance across EU banking markets.

To probe the relationship between market structure and performance within Pakistan's commercial banking sphere, Bhatti and Hussain (2010) employed concentration ratios to scrutinize the Structure-Behavior-Performance (SCP) hypothesis and market shares to test the efficient structure hypothesis. Their study incorporated Return on Assets (ROA), Return on Capital (ROC), and Return on Equity (ROE) as dependent variables alongside firm-specific and market-specific independent variables. The study revealed that Pakistan's banking market exhibits high concentration, primarily orchestrated by the nation's leading banks. They found a positive and significant association between ROA as a profitability measure and market concentration. Conversely, a noteworthy negative relationship surfaced between ROA and competition. Similar trends were observed for ROE, albeit with a weaker connection between market concentration and competition due to its fluctuating trends.

In a parallel investigation within the United States banking sector, Alber et al. (2019) employed Cost Return (ROC) and Cost Efficiency as performance metrics while utilizing market share, Herfindahl-Hirschman Index (HHI), and Hall-Tideman Index (HTI) to gauge concentration levels. The study further incorporated banking-specific independent variables such as size, capitalization, asset quality, liquidity (long- and short-term), stability, profitability, and operational efficiency alongside macroeconomic factors, including economic growth, inflation, and interest rate spreads. Regression analysis underscored a positive and significant relationship between ROC and HTI, indicating that a more concentrated market fosters cost-efficient mergers and acquisitions, potentially yielding higher profits.

According to Bikker and Haaf (2000), one method to gauge market competition is through concentration, with a recognized inverse relationship between the two—high market concentration signals lower competition. Aldaba (2008) and Hien and Hanh (2014) apply this theory to scrutinize the interplay between market concentration and competition within the banking sectors of the Philippines and Vietnam.

Řepková (2012) analyzes the Czech banking industry spanning 2000-2010, leveraging 150 observations across 15 banks. Employing the Herfindahl-Hirschman Index and an eight-company concentration ratio, the study detects a slight reduction in market concentration over the observation period. Moreover, it notes a diminishing concentration among the top three banks in the Czech Republic during the same timeframe. Additionally, the study employs price-cost margins alongside market concentration metrics to assess banks' market power. The findings reveal a positive correlation between concentration and market power, aligning with the SCP hypothesis – higher concentration equates to greater market power for large banks. Notably, the Czech banking landscape exhibits high concentration levels, indicating low competition.

Similarly, Rushchyshyn et al. (2021) yield analogous outcomes in exploring the Ukraine banking industry. The authors calculate concentration values by utilizing the total assets of 26 commercial banking entities in 2019. They employ two concentration ratios, one encompassing the four largest banks in Ukraine and the other including the top eight banks. Results indicate that the four largest banks command 68.28% of the total banking sector, while the top eight banks claim 89.76% of the market share. Interpreting the Herfindahl-Hirschman Index, values below 0.1 denote low concentration, 0.1 to 0.18 signify moderate concentration, and values exceeding 0.18 denote high market concentration. The calculated Herfindahl-Hirschman Index value for the Ukraine banking market stands at 0.14731887, indicative of moderate concentration.

To empirically scrutinize the mediating role of bank behavior, this study adopts the methodology outlined in Seelanatha (2010). Following this approach, if bank performance is influenced by concentration via bank behavior, the following conditions must be met:

- (1) Concentration significantly impacts bank behavior – H_1 ,
- (2) Behavior significantly affects bank performance – H_2 , and
- (3) Concentration influences bank performance independently of behavior – H_3 .

METHODS

This research utilizes data from all 105 commercial banks from 2017 to 2022, sourced from the Indonesian Financial Services Authority (OJK). The variables under investigation are explained as follows:

- Market Structure (Concentration) refers to the level of competition within an industry and will be evaluated using a concentration index based on a structural approach. The concentration level indicates how much the largest companies or banks contribute to the industry's output. A higher concentration implies greater market power and less competition. Building on prior research such as Mishra and Sahoo (2012), this study employs the four-bank concentration ratio (CR4) and the Hirschman Herfindahl Index (HHI) based on assets, loans, and deposits. It is hypothesized that the level of market concentration will negatively influence competition, thus leading to increased bank profits. Therefore, both the concentration ratio and HHI are expected to exhibit a positive relationship with bank profitability.
- In examining bank conduct (behavior), this research focuses on price as an indicator, given that price competition is a crucial aspect analyzed within the banking industry (Neuberger, 1998). Net Interest Margin (NIM) is chosen as the metric, following the rationale put forth by Mishra and Sahoo (2012), who suggested that NIM reflects banks' pricing capabilities. Price competition, a critical behavior within the banking sector (Neuberger, 1989), is examined within the context of the SCP hypothesis. According to Berger and Hannan (1989), if the SCP hypothesis indicates anti-competitive pricing, banks can set lower deposit interest rates and/or higher loan interest rates. Consequently, a higher NIM indicates banks can set lower deposit rates and higher loan rates, reflecting anti-competitive pricing behaviors. In this study, NIM is defined as the difference between the interest income generated by banks and the interest paid to lenders divided by interest-earning assets.
- Bank performance is evaluated using Return on Average Assets (ROA), a commonly used metric in structure and performance analyses within the banking sector. ROA is preferred due to its

consistent and robust relationship with a concentration in banking studies (Nabieu, 2013). ROA provides insight into banks' profitability and efficiency, making it a valuable measure for assessing the performance of banks within the Indonesian banking industry.

By examining these variables, this study aims to comprehensively understand the dynamics between market structure, bank behavior, and bank performance within the Indonesian banking sector. These analyses are expected to shed light on the competitive landscape of the industry and the factors influencing bank profitability. The equations that will be tested in this research are as follows:

$$PRICE_{it} = \alpha + \alpha_2 PRICE_{it-1} + \delta_1 \text{ market structure } 1_t + \delta_2 \text{ market structure } 2_t + \epsilon_{it} \text{ (H}_1\text{)}$$

Here, PRICE represents the market conduct and is calculated by dividing total income by total loans. The market structure variable is measured using the Herfindahl-Hirschman Index (HHI) and CR4 (the ratio of the four largest companies).

$$ROA_{it} = \alpha + \delta_1 \text{Value } \epsilon_{it} \text{ (H}_2\text{)}$$

Here, ROA represents the rate of return on assets, which measures bank performance. The variable "Value" in this equation is calculated as the ratio of total income to total loans.

$$ROA_{it} = \alpha + \delta_{1a} \text{Market Structure } 1 + \delta_{1b} \text{Market Structure } 2_t + \epsilon_{it} \text{ (H}_3\text{)}$$

In this equation, ROA again represents the rate of return on assets, providing insight into bank performance. The "Market Structure" variable is measured using HHI and CR4.

Based on the above information, the following conceptual framework is proposed:

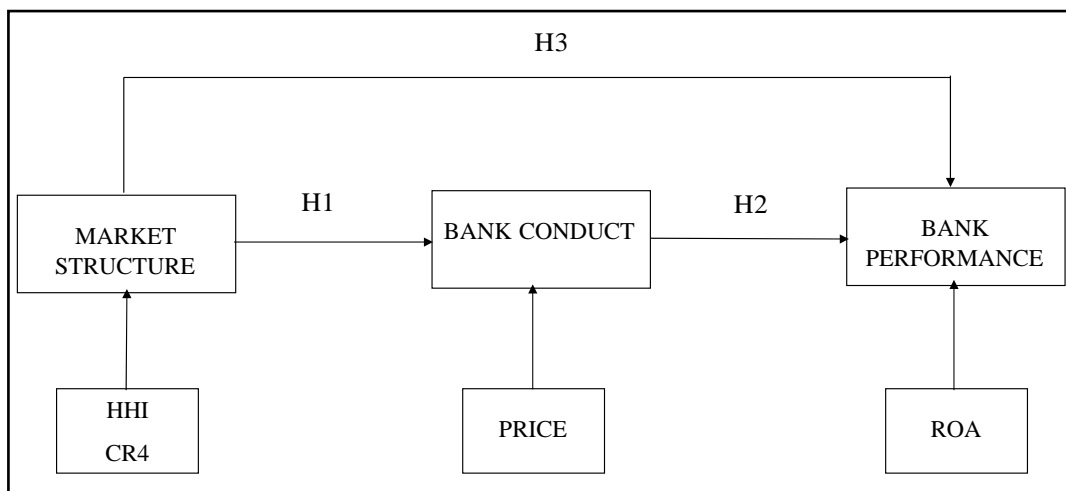


Figure 1: Conceptual Framework

RESULT AND DISCUSSION

The following are Table 1 and Table 2, illustrating the summary statistics and correlation matrix for the data utilized in this analysis:

Table 1: Descriptive Statistics

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
ROA	1365	2.361	3.025	- 15.820	57.000
CR4	1395	0.470	0.022	0.445	0.523
HHI	1395	687.119	73.985	626.244	858.042
PRICE	1377	0.117	0.061	0	2.019

Table 1 presents a concise overview of the statistics concerning the variables under scrutiny. These statistics encompass the mean, standard deviation, and minimum and maximum values for each variable. The table above offers a succinct glimpse into the statistical characteristics of the variables employed in this examination. Return on Assets (ROA) reflects the average efficiency of banks in generating profits from their assets, with an average value of 2,361. Concentration Ratio (CR4) and Herfindahl-Hirschman Index (HHI) delineate the level of market concentration in the banking sector, showcasing an average CR4 of 0.470 and an average HHI of 687,119. These findings indicate the substantial contribution of the four largest banks to the banking landscape, alongside a relatively heightened level of market concentration. Moreover, the variable Price delineates the bank's capacity to set product prices, boasting an average value of 0.117. This analysis serves to illuminate the variances and attributes within the Indonesian banking sector, which stands as the primary focal point of this study.

Table 2: Correlation Matrix

	ROA	CR4	HHI	PRICE
ROA	1			
CR4	0.0945	1		
HHI	0.1069	0.9668	1	
PRICE	0.2153	0.1354	0.1805	1

Meanwhile, Table 2 illustrates the correlation matrix among these variables. Correlation serves as a metric to elucidate the strength of the relationship between two variables. Examining the Correlation Table above, it is apparent that:

- ROA (Return on Assets) demonstrates a relatively weak positive correlation with CR4 (Concentration Ratio) at 0.0945 and HHI (Herfindahl-Hirschman Index) at 0.1069.
- CR4 (Concentration Ratio) strongly correlates with HHI (Herfindahl-Hirschman Index) at 0.9668.
- PRICE (Price) displays a moderately strong positive correlation with ROA (Return on Assets) at 0.2153 and exhibits a moderately weak positive correlation with CR4 (Concentration Ratio) at 0.1354 and HHI (Herfindahl-Hirschman Index) at 0.1805

These findings suggest the following insights from this analysis:

- While there are correlations observed between ROA (Return on Assets) and CR4 (Concentration Ratio) or HHI (Herfindahl-Hirschman Index), the correlation coefficients, which are 0.0945 and 0.1069 respectively, do not surpass a predefined threshold for robustness, typically set at 0.3 or higher, following standard practices in correlation analysis. Further investigation may be warranted to ascertain the precise relationship between these variables.
- A moderately positive correlation between PRICE (Price) and ROA (Return on Assets), with a correlation coefficient of 0.2153, and correlation coefficients not exceeding the common threshold of 0.3 for robustness in correlation analysis suggest that pricing behavior may influence bank performance within the Indonesian banking sector.
- CR4 (Concentration Ratio) and HHI (Herfindahl-Hirschman Index) exhibit a notably strong correlation, with correlation coefficients of 0.9668, indicating a closely intertwined relationship regarding the level of market concentration within the Indonesian banking landscape.

Having discussed the insights from this analysis, we now move to classical assumption tests (auto collinearity, heteroscedasticity, and multicollinearity).

The regression equation's Durbin-Watson (DW) value with Predictors, Price, Market Structure 1; Market Structure 2, and the dependent variable (Price) is 2.078. Given the Durbin-Watson table value for $n=1365$ and $k=3$ with 1% significance, we obtain $dL = 1.5632$ and $dU = 1.7164$. Consequently, the value of $4-dU = 4 - 1.7164 = 2.2836$. As the DW value 2.0782.078 lies between 1.8685(dU) and 2.1315($4-dU$), it is concluded that there is no autocorrelation present in the regression model based on the Durbin-Watson statistic (Ghozali, 2018).

While testing multicollinearity for the dependent variable of Price, which measures the degree of correlation between predictor variables in the regression model. As tolerance values below 0.9 and VIF values below 10 generally indicate no multicollinearity issues (Ghozali, 2018), it is concluded that there is no multicollinearity present in the regression model.

The Breusch-Pagan test results for the dependent variable of price indicate that the LM statistic is 2.124 with a p-value of 0.145. Since the p-value is more significant than the conventional significance level of 0.05, we fail to reject the null hypothesis of homoskedasticity (Breusch & Pagan, 1979). Therefore, there is no evidence of heteroskedasticity in the regression model.

Table 3: Correlation Relationship between Market Structure and Prices

Dependent Variable: PRICE	CR4			HHI		
	Coeff	t-stat	P value	Coeff	t-stat	P value
PRICE	0.501	12.41	0.0000	0.56357990	13.21	0.000
Market Structure 1	-7.91	-5.57	0.0000	-0.0006208	-2.71	0.008
Market Structure 2	8.056	5.43	0.0000	0.00000039	2.49	0.015

The regression results in Table 3, utilizing HHI and CR4 as market structure parameters, consistently reveal significant outcomes. Notably, the analysis reveals significant outcomes across the variables examined. Specifically, the correlation coefficients for PRICE with CR4 and HHI are 0.501 and 0.564, respectively, indicating strong positive correlations with both market structure parameters. Moreover, the lag of the dependent variable shows a highly significant positive correlation with price, highlighting the adjustment speed in response to market changes. Interestingly, the results of this study diverge from previous research by Lu & Liu (2012), revealing a counterintuitive trend: higher market concentration corresponds to lower prices. This unexpected relationship is rationalized by the notion that mergers can amplify economies of scale within the banking sector. As mergers elevate the concentration ratio, they also enhance the economies of scale of the merged banks. Consequently, the merged entity, now more prominent, can leverage improved economies of scale to offer more competitive rates. This merger phenomenon heightens concentration ratios while improving banks' cost efficiencies concurrently, leading to the observed downward price trend. Furthermore, the relationship between market structure and prices, alongside its squared counterpart, exhibits opposing signs. Specifically, the market structure holds a negative coefficient in the Indonesian commercial banking domain. In contrast, the square of the market structure reflects a positive sign, illustrating a U-shaped curve in the relationship.

The regression equation's Durbin-Watson (DW) value with predictor price and dependent variable of ROA is 1.9635. Given the Durbin-Watson table value for $n=1365$ and $k=1$ with 1% significance, we obtain $dL = 1.8726$ and $dU = 1.8756$. Consequently, the value of $4-dU = 4 - 1.8756 = 2.1244$. As the DW value 1.9635 lies between 1.8756(dU) and 2.1244($4-dU$), it is concluded that there is no autocorrelation present in the regression model based on the Durbin-Watson statistic.

Multicollinearity for the dependent variable of ROA measures the degree of correlation between predictor variables in the regression model. As tolerance values below 0.9 and VIF values below 10 generally indicate no multicollinearity issues, it is concluded that no multicollinearity is present in the regression model.

The Breusch-Pagan test results for the dependent variable of ROA indicate that the LM statistic is 3.589 with a corresponding p-value of 0.087. Since the p-value is more significant than the conventional significance level of 0.05, we fail to reject the null hypothesis of homoskedasticity. Therefore, there is no evidence of heteroskedasticity in the regression model.

Table 4: Relationship between Price and Profitability

Dependent Variable: ROA	Independent Variable: PRICE		
	Coeff	t-stat	P value
ROA	10.345	4.71	0.000

Table 4 showcases the outcomes of the regression analysis exploring the relationship between price and profitability, with ROA as the dependent variable. Employing random effects, the analysis aims to capture the influence of various random variables on profitability that are not elucidated by individual banks. Consistent with the findings of Bhatti and Husain (2010), the regression results unveil an expected positive correlation between price and profitability. Specifically, the coefficient for PRICE stands at 10.345, with a statistically significant t-statistic of 4.71 and a p-value of 0.000, indicating a strong relationship. This suggests that higher prices are associated with increased profitability within the banking sector.

The Durbin-Watson (DW) value of the regression equation for the variable of price and the dependent Variable, ROA, is 1.9885. Given the Durbin-Watson table value for $n=1365$ and $k=2$ with 1% significance, we obtain $dL = 1.8716$ and $dU = 1.8769$. Consequently, the value of $4-dU = 4 - 1.8756 = 2.1231$. As the DW value 1.9885 lies between $1.8769(dU)$ and $2.1231(4-dU)$, it is concluded that there is no autocorrelation present in the regression model based on the Durbin-Watson statistic.

The multicollinearity test for the dependent price variable measures the degree of correlation between predictor variables in the regression model. As the Tolerance value (Market Structure 1 = 0.613, and Market Structure 2 = 0.742) close to 1 and VIF values below 10 generally indicate no multicollinearity issues, it is concluded that no multicollinearity is present in the regression model.

The Breusch-Pagan test results indicate that the LM statistic is 2.987 with a corresponding p-value of 0.084. Since the p-value is more significant than the conventional significance level of 0.05, we fail to reject the null hypothesis of homoskedasticity. Therefore, there is no evidence of heteroskedasticity in the regression model.

Table 5: Relationship between Market Structure and Profitability

Dependent Variable: ROA Independent Variable:	HHI			CR 4		
	Coeff	t-stat	P value	Coeff	t-stat	P value
Market Structure 1	0.009	0.45	0.0653	-309.1588	-3.11	0.002
Market Structure 2	-4.50E-06	-0.33	0.741	325.9568	3.18	0.001

Table 5 presents the regression results concerning the relationship between market structure and profitability, employing random effects. Following the research by Yuanita (2019), the results of the regression utilizing HHI and CR4 diverge in direction. While CR4 emerges as a significant factor influencing profitability, as evidenced by the low p-values of 0.002 and 0.001, the coefficients associated with CR4 in Market Structure 1 and 2 are -309.1588 and 325.9568, respectively. These coefficients suggest a mixed relationship between CR4 and profitability rather than a notable negative or positive correlation.

The significant coefficients for CR4 indicate that an increase in CR4, and hence a larger market share by the top four banks, corresponds to changes in profitability. The heightened CR4 value suggests a stronger dominance of the top four banks in the market, necessitating further expansion. However, such expansions incur costs for banks, and specific expansions may not yield immediate profits. For instance, endeavors such as introducing new products or venturing into novel territories incur substantial costs without an immediate boost to profitability. Consequently, the rise in market share of the top four banks is juxtaposed with potential changes in Return on Assets (ROA).

Additionally, the regression results utilizing HHI as a market structure parameter do not demonstrate a significant coefficient. These results indicate that HHI does not emerge as a significant factor in bank profitability. Movements in HHI are influenced by the market share of all banks, where an increase in the share of smaller banks leads to a rise in the HHI. Such increases in HHI can stem from various factors, including mergers. A successful merger can enhance efficiency and subsequently boost profitability. However, the performance effects of some mergers may take time to materialize, with merger costs potentially impacting ROA negatively. Building upon the results, a more nuanced understanding of the relationship between market structure and return on assets can be gleaned by examining regressions for each bank classification. Given that banks within the same group tend to exhibit more homogeneity, conducting regressions for each group is expected to offer a more precise insight.

CONCLUSION

In conclusion, the research findings shed light on the complex interplay between market structure, bank behavior, and profitability within the Indonesian banking sector. Based on these insights, several policy recommendations emerge to enhance the sector's efficiency, competitiveness, and stability. The study advocates for continuing consolidation policies within the Indonesian banking sector. Consolidation can increase market concentration, driving prices downward and improving competitiveness. Through mergers, banks can expand their asset base, achieve economies of scale, and lower marginal costs, benefiting customers and potentially boosting profitability. Secondly, policymakers are urged to monitor various competition measures within the banking sector closely. The study highlights that structural and non-structural competition measures offer different perspectives on competition dynamics. By monitoring multiple indicators, policymakers can gain a more comprehensive understanding of the competitive landscape and make informed decisions to promote healthy competition. Lastly, diversifying ownership structures is recommended to mitigate the potential adverse effects of concentrated ownership on bank profitability. The research suggests that concentrated ownership may lead to lower profitability, emphasizing the importance of implementing governance practices to ensure effective management of ownership concentration, particularly in light of policies like the single presence policy. These policy recommendations aim to foster a more competitive, efficient, and stable banking environment in Indonesia. By promoting consolidation, monitoring

competition measures, and diversifying ownership structures, policymakers can contribute to sustainable economic growth and enhance the overall performance of the banking sector.

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