



# Structure, Conduct, and Performance of the Indonesian Banking Sector with Moderating Pandemic COVID-19 towards a Sustainable Banking Business

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## Authors' contributions

*This work was carried out in collaboration among all authors. Author FML is designing the main idea of the study. Author Jakaria running the data and research design of the manuscript. Author KC is developing the hypothesis of the study. Author WRS contributes to literature review and references of the paper. All authors read and approved the final manuscript.*

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## ABSTRACT

**Aims:** This research was conducted to analyze the implementation of Structure, Conduct, and Performance in the banking industry in Indonesia with the ultimate goal of achieving a sustainable banking economic business.

**Study Design:** This research uses quantitative research with hypothesis testing.

**Place and Duration of Study:** Indonesian Banking between 2018 to 2021.

**Methodology:** The analytical method used is Structural Equation Model Partial Least Square (SEM-PLS).

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**Results:** From the research findings described above, the following are some conclusions that can be drawn 1) The market structure and map of banking competition in Indonesia in the 2018-2021 period is an oligopoly market where state-owned banks and Bank Central Asia (BCA) are market leaders in the banking industry in Indonesia; 2) Market structure is proven to have a significant positive effect on conduct (behavior), namely the financial ratios of banks in Indonesia; 3) The COVID-19 pandemic did not moderate the effect of market structure on conduct (behavior), namely banking financial ratios in Indonesia; 4) Market structure is proven to have a positive effect on performance, namely sustainable economic performance in the banking industry in Indonesia; 5) The COVID-19 pandemic is not proven to be a variable moderating the effect of market structure on performance, namely sustainable economic performance in the banking industry in Indonesia; 5) Conduct has been proven to have a significant positive effect on performance, namely sustainable banking economic performance; The COVID-19 pandemic has been proven to be a variable that moderates the influence of conduct (behavior) on performance, namely sustainable banking economic performance.

**Conclusion:** The findings of this study indicate that market structure has proven to have a direct or indirect effect on sustainable economic performance mediated by conduct.

*Keywords: Structure; conduct; performance; banking sector; sustainable economics business.*

## 1. INTRODUCTION

The triple bottom line theory introduced by John Elkington states that companies that want to be sustainable must pay attention to "3P, namely Profit, People, Planet, and Profit". The profit aspect states that companies must be oriented to get maximum profits so that business activities can continue to operate and develop. The people aspect shows the company's sensitivity to concern for the community's welfare through community relations programs, community empowerment, and community service. The environmental aspect states that visionary companies must make long-term investments in the form of their level of concern for the environment and the sustainability of biodiversity where these three aspects are the main pillars of a sustainable business [1].

In the digital era where every activity transaction is carried out by companies, the role of Financial Technology (Fintech) is a necessary condition in the implementation of business activities carried out by economic actors in the context of achieving a sustainable business. Governor of Bank Indonesia Perry Parjio stated that it is necessary to develop sustainable financial inclusion instruments in regulating money market conditions in Indonesia. According to the Governor of Indonesia, 3 strategies are needed to improve Sustainable Financial Instruments (SFI) to achieve a sustainable financial market. First, the importance of developing financial instruments and green investment to promote sustainable and inclusive economic growth. This can become a new source of growth, expand the

workforce and support the achievement of the 2030 Paris Agreement. Second, the importance of building a sustainable financial instrument ecosystem. This can be realized with the support of all related parties through incentive and disincentive policies, building resilient infrastructure, including other important elements such as green taxonomy, verification services, green certification agencies, and green rating providers. Bank Indonesia and the government will play a role in the development of a green ecosystem in Indonesia through policies and support for green money market instruments, green and inclusive financing for MSMEs as well as a sustainable Sharia economy and finance. Third, ongoing capacity-building and technical assistance programs are important in increasing the understanding and expertise of all parties. The success of SFI development will be determined by the resilience of collaboration, togetherness, and mutual support among all stakeholders. ([www.bi.go.id/en/publishing](http://www.bi.go.id/en/publishing)).

Until 2018 the banking market in Indonesia was dominated by state-owned banks; where of the 5 main players that controlled the market, Bank Rakyat Indonesia (BRI) dominated with total assets of IDR 1,183.4 trillion in the first place, followed by Bank Mandiri in second place with total assets of IDR 1,173.6 trillion, then Bank Nasional Indonesia (BNI) is in fourth place with total assets of IDR 763.5 trillion, followed by Bank Tabungan Negara (BTN) in fifth place with total assets of IDR 272.3 trillion. Bank Central Asia (BCA) is a private bank ranked in the top five with total assets of IDR 798.9 trillion.

Structure, Conduct, and Performance is an analytical tool that can be used to find out how the level of banking competition influences behavior and ultimately results in the performance of the company as a result of the influence of structure and conduct. The market structure of a particular industry can determine the market power of the producer. The results of empirical studies show [2,3] that the market structure of the banking industry in Indonesia is an oligopoly market, a loose oligopoly market with CR (4) between 38-50%.

The market structure faced by a producer will influence what actions and strategies will be carried out by the activity producer which is reflected in the financial ratios achieved by the company. A number of empirical studies have been conducted regarding the effect of market structure on conduct. The results of empirical studies [4,5,3] found that market structure proved to have a positive effect on conduct in this case, profitability. Market structure can also directly affect performance as shown by the findings of research [6-8].

Based on the explanation of the problems above, this research was conducted to analyze the Structure, Conduct, and Performance of banking competition in achieving the banking economic business in the banking industry in Indonesia.

This study aims to optimize the ultimate goal, namely a sustainable banking economy with reference to POJK 51 of 2017, which is related to implementing sustainable finance in the financial sector. This research is limited to the financial sector, specifically the banking sector, from 2018-2021. In this panel, the implementation of sustainable banking finance is only focused on economic aspects and does not include environmental, social, and governance aspects.

### 1.1 Structure-Conduct-Performance (SCP)

The SCP theory relates to the paradigm in industrial economics to link market structure elements with the behavior and performance of a particular industry. There are three concepts in SCP analysis, namely.

**Structure:** The Structure concept aims to determine the market structure usually defined by the market concentration ratio. The lower the market concentration, the higher the level of competition in the market, and conversely, the

higher the market concentration, the lower the level of competition in the market.

Market structure is the character of a market that influences the competitive strategy and pricing of the market. Market structure can also be understood as a relatively permanent strategic part of the company's environment that will affect and be affected by the behavior and performance of companies in a market. So, the structure will affect the pattern of behavior.

**Conduct:** The concept of construct relates to the behavior of companies in the industry, for example in pricing, advertising, and production with outputs that can be seen from the company's financial condition which can be seen from the achievement of the company's financial ratios. The behavior of companies in the industry will affect performance where the higher the level of competition or competition, the lower the market power which will ultimately impact the lower the company's profits (decreased company performance) and vice versa. The company's conduct aims to:

- a. Exploitation of market power, can be in the form of price and non-price which aims to control the market. For example, in a monopoly market, a monopolist increases and limits output to maximize profit. Whereas in an oligopoly market (for example CARTEL), actors can form a single agent so that buyers only have one seller, so a monopoly situation will be created, meaning that prices and output are controlled by one seller. Exploitation in the form of non-price, for example by reducing product quality, so that costs will decrease and can increase profits.
- b. Expansion of market power, by having market power, the company can expand its market power in the long term. Expansion of market power can be in the form of price or non-price, such as price discrimination and increased facilities.
- c. The combination of exploitation and market expansion: Control over prices illustrates the company's power over market power. Market power is the company's ability to influence market prices and beat competitors. Behavior will impact the company's strategy, profits, barriers to market entry, position

in the industry, and influence the behavior of its competitors.

**Performance:** Performance or performance is the achievement obtained by the company in accordance with the target). Another performance measure is the company's profits or profitability. Performance or performance is the implication or result of market behavior. Performance describes how well the market is working. The market performance dimension analyzes industrial organizations that address efficiency, fairness, and progress. Efficiency describes how well the market uses limited resources. Justice explains how fairly the market distributes profits from economic activity to economic actors. Progress describes how effectively the market provides changes to new and better products and advances in production techniques.

Differences in the performance of each company will create competition against competing companies. Company performance can be measured from production efficiency and allocation efficiency. Production efficiency includes cost and profit structures, while allocative efficiency is related to market power. Allocative efficiency and fairness will create behavior that approaches the behavior in a perfectly competitive market. While productive efficiency (as measured by economies of scale) and technical progress will result in a market with a few companies with various products. Many studies using SCP analysis in industries use price (reflection of cost structure) as a performance measure, such as research using Price Cost. Margins as a performance measure, or using the ratio of interest on loans and interest on deposits to proxy for price variables in the banking industry.

**Financial performance:** Company performance is a general term used for some or all of the actions of an organization in a certain period [9,10]. Performance measurement is the periodic determination of the operational effectiveness of an organization or company based on predetermined goals, standards, and criteria [11,12]. Performance is a result of the function of the activities or work of a person or group within an organization and is influenced by several factors to achieve organizational goals within a certain period [13]. Another definition of financial performance is a formal attempt to evaluate the efficiency and effectiveness of a company in generating profits and certain cash positions

[14,15]. By measuring financial performance, the prospects for growth and financial development of the company can be seen by relying on its resources [16,17]. A company is said to be successful if the company has achieved a particular predetermined performance [18,19]. Company performance is an analysis carried out to determine the extent to which the company has implemented established rules related to the proper and correct use of finance [20]. Meanwhile, financial performance is the result or achievement that has been achieved by company management in managing company assets effectively for a certain period [15,21]. Based on some of the definitions above, it can be concluded that financial performance is an analysis that describes the results or achievements achieved by the company's financial management in managing funds and assets according to standards set by the company.

**COVID-19 pandemic:** The COVID-19 pandemic, which is considered a global crisis, has had a drastic impact on the global financial sector [22]. Social distancing, quarantine, and national lockdown have affected all sectors and brought social and economic consequences that cannot be overcome and have a significant impact on ASEAN banking as the majority of economic activity actors, both directly and indirectly, where all activities are carried out through the banking sector [23]. The government announced various stimuli to reduce public activity, which would cause liquidity pressure on the global banking system, eventually creating a liquidity crisis that would lead to an increase in problem loans [24].

## 1.2 Previous Empirical Studies

### 1.2.1 Empirical study of banking market structure

Theory of Structure, Conduct, and Performance in the banking sector is carried out to identify the structure of the banking market as well as know the level of competition that occurs in the banking industry. Some empirical studies have been carried out in relation to the analysis of competition in the banking industry [2] in his research found that the structure of the Indonesian banking market in the 2009-2018 period was included in the type IV category where the 4 main players in the market (CR4) had a market share of 35% and were included in the type IV criteria group with a market share between 38 – 50%. In other words, the banking

industry in Indonesia has a loose oligopoly market structure. These findings are supported by an empirical study conducted by [3] that the Indonesian banking structure during the 2007-2016 period was included in the type IV group, namely loose oligopoly as well as the banking structure in the Philippines which was included in the type IV group (loose oligopoly).

### 1.2.2 Empirical study of the effect of market structure on conduct

As explained above, in SCP (Structure, Conduct and Performance) theory, the market structure in the banking industry will influence the behavior of market participants in formulating and carrying out an action to achieve the goals set by the company. This can be seen from the condition of the cost structure and receipts that occur in the company. Several empirical studies have been conducted in relation to the effect of market structure on the company's financial condition [3] in his research produced findings that market structure in existing industries would certainly influence company behavior which could be reflected in the financial conditions that occurred in companies where the market structure using CR (4) proved to have a positive effect on conduct in terms of this is profitability. The results of this empirical study are supported by the findings of an empirical study conducted by [4,5].

### 1.2.3 Empirical study of the effect of market structure on performance

The market structure faced by producers can directly affect the performance of the company concerned [4,25]. An increasingly concentrated market causes a producer to improve its performance through its market power as a result of controlling large markets. The results of an empirical study yielded findings that financial ratios positively affect the company's financial performance [8].

### 1.2.4 Empirical study of the effect of conduct on performance

A producer who has high market power has the power to influence the market which will ultimately affect the performance of a healthy company both in the short and long term and ensures a sustainable business. Empirical studies related to the effect of conduct on performance have been carried out by previous researchers which resulted in findings that financial performance, namely leverage (DER) and ROA, has proven to have a significant effect on firm value (Ulfa & Asyik, 2018).

Crystallization and empirical studies related to the relationship between variables or the influence of the independent variables on the independent variables resulted in a framework that became the basis for this study as shown in the following figure.

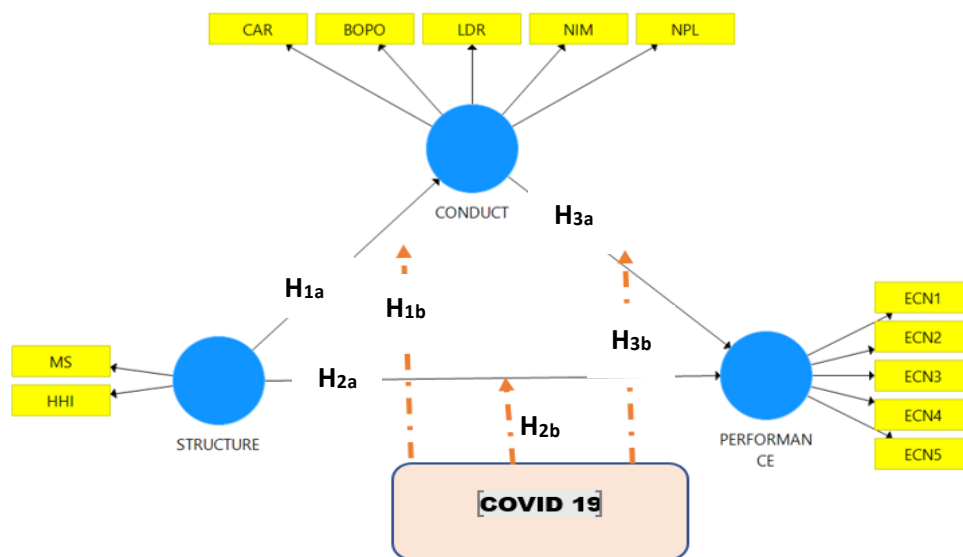


Fig. 1. Conceptual framework

### 1.3 Hypothesis Development

Competition in the business world can be seen from the market structure faced by every business actor involved in business activities in the particular industry they face. If the market structure is in the form of perfect competition, then the competition in the business world will be higher and vice versa if the market structure leads to a monopoly market then the competition is dominated by several major players. An increasingly concentrated market allows collusion between large companies in an industry with the aim of hindering the development of small and new companies. This condition indicates that the existing market structure of the industry will certainly influence company behavior which can be reflected in the financial conditions that occur in the company [3]. The results of an empirical study conducted [3] show that market structure using CR(4) has proven to have a positive effect on conduct in this case is profitability. This shows that large companies can regulate market conditions through price levels so that colluding companies can obtain high profits. The results of this empirical study are supported by the findings of an empirical study conducted by [4,5]. The findings from Cakranegara's research (2021) show that during the COVID-19 pandemic, banks that are included in the BUKU 4 group, namely those with the largest market share, have better financial performance than other BUKU banks. Based on the explanation above, the hypothesis proposed in this study is:

H1a: Market structure in the banking industry has a significant effect on Conduct, namely banking financial performance

H1b: The COVID-19-19 pandemic moderates the influence of the banking market structure on conduct, namely banking financial performance

An increasingly competitive market structure can be characterized in that the barriers for new producers to enter the market are relatively low so that producers tend to be free to enter and leave the market. One of the factors that manufacturers can do to achieve their ultimate goal is product differentiation. A market with a high level of competition will encourage companies to carry out their business activities efficiently so that as a whole it will encourage a sustainable business. The results of an empirical study conducted by [26] yielded findings that increasingly competitive banking competition is indicated by the low Lerner Index and Herfindall

Index which will increase sustainable business from an economic aspect and conversely a market structure that is increasingly concentrated in certain companies will reduce performance sustainable economic performance. The results are supported by empirical studies conducted by [26,27] which resulted in findings that market share significantly affects banking financial performance. The COVID-19 pandemic has had an impact on all aspects of world life including the global economy, of course, in the operation of companies in various sectors [28]. The banking sector is one of the sectors affected by the COVID-19 pandemic. During the COVID-19 19 pandemic, banking was very vulnerable to the effects, because debtors from various industrial sectors who were affected experienced problems in carrying out their obligations such as paying off debts [29] so that in the end it would affect the banking business in the future, especially from an economic aspect. Based on the explanation above, the hypothesis proposed in this study is:

H2a: Market structure has a significant effect on banking performance

H2b: The COVID-19 19 pandemic moderates the effect of market structure on banking performance

Companies that have the power to influence the market can be reflected in healthy financial performance for liquidity, solvency, and profitability. This will affect the company's performance. Companies with high financial performance will also produce high corporate performance and vice versa. Empirical studies have found that financial performance, namely leverage (DER) and ROA, has proven to significantly affect firm value (Ulfa & Asyik, 2018). The condition of the COVID-19 19 pandemic is that banks are very vulnerable to the impact, primarily related to bad credit problems [29]. Based on the results of this empirical study, the hypothesis proposed in this research is:

H3a: Conduct that is reflected in financial performance has a significant effect on banking performance

H3b: The COVID-19 19 pandemic moderates the influence of conduct which is reflected in financial performance on banking performance

From the results of the empirical study hypothesis 1a was carried out with the aim of examining the effect of structure on conduct while in hypothesis 3 aiming to examine the effect of conduct on performance, this study will

examine the indirect effect of structure on performance with conduct as a mediating variable. The proposed hypothesis is stated as follows:

H4: Structure as measured using market structure has an effect on performance which is reflected in sustainable economic performance mediated by conduct.

## 2. MATERIALS AND METHODS

### 2.1 Research Design

This research uses quantitative research with hypothesis testing. In the early stages, it will be

carried out to identify the market structure to know and analyze the map of banking competition in Indonesia. In the second stage, research hypotheses will be tested to examine the effect of market structure and financial performance on sustainable economic performance in the banking industry in Indonesia with the COVID-19 pandemic as a moderating variable because the research is in between the pandemic period. Hence, it makes sense to add the variable.

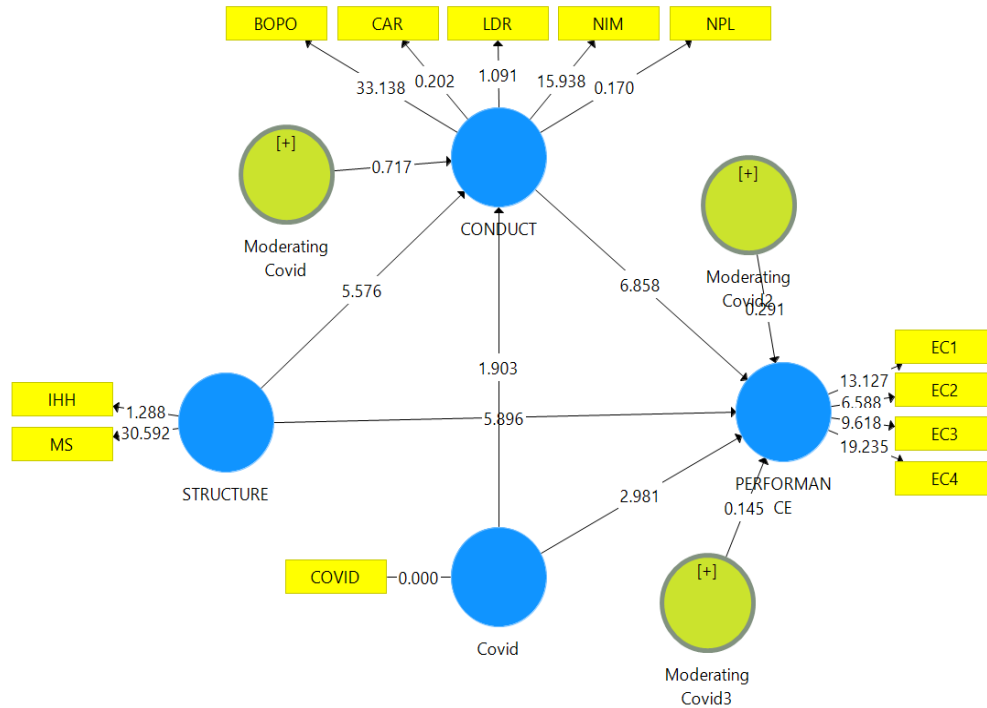
### 2.2 Variables and Measurements

The variables used in this study consist of 4 types, summarized in Table 1.

**Table 1. Variables and measurements**

Variable	Measure	Literature
<b>Dependent</b>		
Index	$ECSUSDi = \frac{\sum X_i}{T\_Indicator} \times 100\%$ <p>Measurements are made using content analysis:                      0 for a low-value measurement item                      1 for a high-value measurement item</p>	OJK Regulation No 51/POJK.03/2017 Concerning the Implementation of Sustainable Finance for Financial Services Institutions, Issuers, and Public Companies
<b>Independent</b>		
Market Share	$MS_i = \frac{Revenue_{it}}{Revenue_t} \times 100\%$	
Herfindhal Hirschman Index	$HHI = MS_1^2 + MS_2^2 + MS_3^2 + \dots + MS_n^2$	
<b>Intervening</b>		
Capital Adequacy Ratio	$CAR = \frac{Equity}{ATMR} \times 100\%$	[9]
Operating Expenses	$BOPO = \frac{Operational\ cost}{Operational\ revenue} \times 100\%$	[10]
Operating Income		
Loan Deposit Ratio	$LDR = \frac{Credit}{Third\ party\ fund} \times 100\%$	[9]
Net Interest Margin	$NIM = \frac{Total\ Net\ Interest\ Income}{Average\ Productive\ Assets} \times 100\%$	[15,10]
Return on Asset	$ROA = \frac{Net\ Income}{Total\ Asset}$	(Muchdiarti et al. 2021); [10]
<b>Moderating</b>		
Pandemic COVID-19-19	Dummy: 0 for conditions before the pandemic (2018-2019) and 1 for conditions during the pandemic (2020-2021)	

Where:  $ECSUSDi$  = Economics Sustainability Index  
 $\sum X_i$  = Total score of the ECUSDi indicator value which has a value of 1  
 $T+Indicators$  = The total of all ECSUSDi indicators is 5 indicators  
 $MMSi$  = Market Share of a certain company  
 $Revenueit$  = Total income of certain banking in a certain year  
 $Total\ Revenueit$  = Total revenue of the banking industry in year t,  $RWA$  = Risk Weighted Assets



**Fig. 2. SEM-PLS Model**

Next, describe the graph into an econometric equation model which is expressed by the following equation:

$$\begin{aligned}
 \text{COND} &= \beta_1 \text{STRUC} + \beta_2 \text{COVID-19} + \beta_3 \text{STRUC} * \text{COVID-19} + \varepsilon_1 \quad (1) \\
 \text{PERF} &= \delta_1 \text{STRUC} + \delta_2 \text{COND} + \delta_3 \text{COVID-19} + \delta_4 \text{STRUC} * \text{COVID-19} \\
 &\quad + \delta_5 \text{COND} * \text{COVID-19} + \varepsilon_2 \quad (2)
 \end{aligned}$$

### 2.3 Data and Samples

The population in this study are banking companies listed on the Indonesia Stock Exchange. Sampling was carried out using purposive sampling with the following criteria: 1) Banking companies listed on the Indonesia Stock Exchange and on this criterion, a total of 47 companies were obtained as shown in Appendix 1, 2) Banking companies listed on the IDX that published annual reports 2018 - 2020 where 33 banking companies were obtained according to this criterion as shown in Appendix 2. In conclusion, the total sample used in this study was 33 banking companies during the 4-year research period so the total sample was 132 samples.

### 2.4 Analysis Methods

The data analysis method used is Structural Equation Modeling Partial Least Square (SEM-PLS) which accommodates the estimation of several models simultaneously either by

including direct effects, indirect effects, and moderating variables in the estimated equation. The following is the SEM-PLS research model in Fig. 2.

## 3. RESULTS AND DISCUSSION

### 3.1 Descriptive Statistics

Competition in the Indonesian banking industry during the 2018-2021 period was dominated by state-owned banks, the majority of which occupy the 5 best ratings in terms of market share. For more detailed information can be seen in Table 2.

During the 2018-2021 period, the main ranking for Indonesia's banking market share was dominated by state-owned banks, namely BRI, Mandiri, BNI and BTN which respectively ranked 1, 2, 3 and 5 while for rank 4 was occupied by BCA. BRI, which during the 2018-2021 period was ranked first for banking market share, will begin to be shifted by Bank Mandiri in 2021.



**Table 2. Ranking of the Top 10 Indonesian Banking Industry Market Shares**

No.	Company	2018	2019	2020	2021
1	BMRI	17.415	19.296	15.847	16.093
2	BBRI	18.786	19.372	16.547	15.650
3	BBCA	10.638	11.194	10.333	10.496
4	BBNI	11.712	11.562	8.632	8.998
5	BBTN	4.439	4.263	3.712	3.468
6	BNGA	3.864	3.753	2.887	2.898
7	BNLI	2.256	2.208	2.032	2.186
8	NISP	2.514	2.471	2.120	1.999
9	PNBN	3.001	2.889	2.241	1.907
10	BDMN	2.588	2.646	2.065	1.793
Other		22.786	20.346	33.582	34.511
Total		100.000	100.000	100.000	100.000

Source: Data processed (2022)

**Table 3. Descriptive Statistics**

Variable	2021	2020	2019	2018
Economic performance	62.50	44.85	52.21	55.88
Market share (%)	2.284	2.311	2.804	2.697
IHH	1,243.35	1,218.86	1,109.12	1,055.78
CAR	28.526	23.467	21.043	21.226
BOPO	103.976	95.258	88.539	84.909
LDR	76.326	85.322	90.028	88.255
NIM	3.468	3.601	4.233	4.765
NPL	3.679	4.058	3.510	3.628

Source: Data processed (2022)

The economic performance of the banking industry in the 2018-2020 period experienced a decline, namely from 55.88% in 2018, decreased to 57.21% in 2019, during the COVID-19 pandemic it again experienced a significant decrease, namely to 44.85% and 2021 is marked by an increase in sustainable economic performance in the banking industry in Indonesia to 62.50%.

The Market Share variable for the pre-COVID-19 period is shown by an increase in the average market share of banking, namely from 2.697% in 2018 to 2.804% in 2019. COVID-19 is shown by a decrease in the average banking market share, namely to 2.311% at the peak of COVID-19 2020 and will decrease again in 2021, namely 2.284%. This shows that there was an increase in competition in the banking industry during the COVID-19 period compared to pre-COVID-19 conditions.

The Herfindahl Hirschman Index (HHI) shows that during the 2018-2020 period, the market structure of the Banking Industry in Indonesia was included in the loose oligopoly category (moderately concentrated) because it was in the

range of IHH values between 1000 to 1800. If we look at the development of IHH during 2018- In 2021 there will be an increase in the IHH value from year to year which shows that the level of concentration of the banking industry in Indonesia is increasing or in other words, the market share value for banks that dominate the banking market in Indonesia is increasing.

CAR during the 2018-2021 period shows an increasing trend from year to year for the average CAR value in the banking industry in Indonesia. In 2018, the average CAR value of banking in Indonesia was 21.226%, slightly decreased in 2019 to 21.043%, then marked by an increase in 2020 of 23.467% and experienced a significant increase in 2021 to 28.526%.

BOPO is an indicator of financial ratios that can be used to evaluate the efficiency of business activities carried out by banks by comparing operating expenses to operating income. A low BOPO ratio shows that the bank is more efficient in running its business. Conversely, a higher BOPO ratio indicates a low level of bank efficiency in running its business. The results of calculating the BOPO ratio in the banking

industry in Indonesia during the 2018-2021 period show an increase in the BOPO ratio. This increase was quite significant during the COVID-19 pandemic. In 2018 the average BOPO of the banking industry in Indonesia was 84.909%, experiencing an increase in 2019 to 88.539%, which continued to increase in 2020 to 95.258%, and in 2021 experienced a significant increase to 103.976%. This condition shows that the COVID-19 pandemic has significantly impacted the efficiency of banking management in Indonesia.

The money market shows the interaction between the demand for money and the supply of money. One indicator of the success of banking operations is when a bank can collect third-party funds optimally and channel the funds by extending credit to debtors. LDR is a financial ratio that reflects a bank's ability to provide credit from funds raised. Conditions before the COVID-19 pandemic were marked by increasing the LDR ratio of the banking industry in Indonesia, which was 88.255% in 2018 then experienced an increase in 2019 to 90.028%. 2020 was marked by a decrease in the LDR ratio to 85.322% and in 2021 it experienced a significant decline again where the LDR value was 76.326%.

NIM is a profitability ratio that measures how much productive assets can generate interest income. The figure shows that during the 2018-2022 period, Indonesia's average banking NIM ratio decreased from year to year. This decline has become even more significant during the 2020-2021 COVID-19 pandemic. In 2018, the average NIM of the Indonesian banking industry was 4.765%, then decreased to 4.233%. The COVID-19 pandemic impacted a significant decrease in the NIM ratio, namely to 3.601%, and in 2021 it decreased again to 3.468%.

NPL is a financial ratio that measures the percentage of bad loans from each bank of the total credit loans. In 2018, Indonesia's average NPL of the banking industry was 3.628%, then

decreased to an average of 3.510% in 2019. The COVID-19 pandemic resulted in a significant increase in NPLs in 2020 to 4.058% and in 2021 again the decline in the NPL of the banking industry to 3.679%.

### 3.2 Model Fit Evaluation

Multicollinearity is an assumption that must be met in the PLS SEM model where the independent variables in each structural equation cannot be related to each other.

From the Table 4 it can be seen that in both the Conduct and Performance models there is no multicollinearity as indicated by the VIF value for each independent variable < 10 for both the Conduct model and the Performance model.

### 3.3 Coefficient of Determination

The following are the results of the coefficient of determination test which can be seen in Table 5.

The Conduct model obtained an adjusted R square of 0.244, which means that the variation of the independent variable, namely Structure and the interaction of COVID-19 with structure, is able to explain the variation of the dependent variable, namely conduct, by 24.4%, while the remaining 75.6% is explained by variations from other independent variables. which affect conduct but are not included in the model.

Meanwhile, the Performance model obtained an adjusted R square of 0.457, which means that the variation of the independent variables namely structure, conduct and moderation of COVID-19 on structure and conduct is able to explain the variation of the dependent variable, namely sustainable economic performance of 45.7% while the remaining is 54.3%. is a variation of other independent variables that affect performance but are not included in the model.

**Table 4. Multicollinearity Testing**

	<b>Conduct</b>	<b>Performance</b>
Conduct		1.598
COVID-19	1.078	1.107
Moderating Effect 1	1.024	
Moderating Effect 2		1.496
Moderating Effect 3		1.320
Performance		
Structure	1.102	1.420

Sources: Data processed (2022)

**Table 5. Coefficient of determination**

Model	R-Square	R-Square Adjusted
Conduct	0.260	0.244
Performance	0.477	0.457

Sources: Data processed (2022)

### 3.4 Hypothesis Testing Test

**Table 6. Hypothesis Testing Test**

Hypotheses	Coefficient	t-value	p-value	Decision
H1a: Market structure in the banking industry has a significant effect on Conduct, namely banking financial performance.	0.465	5.146	0.000	Accepted
H1b: The COVID-19 pandemic moderates the influence of the banking market structure on conduct, namely banking financial performance.	0.058	0.674	0.500	Rejected
H2a: Market structure has a significant effect on banking performance	0.342	5.795	0.000	Accepted
H2b: The COVID-19 pandemic moderates the effect of market structure on banking performance	0.025	0.284	0.776	Rejected
H3a: Conduct which is reflected in financial performance has a significant effect on banking performance	0.484	6.752	0.000	Accepted
H3b: The COVID-19 pandemic moderates the influence of conduct which is reflected in financial performance on banking performance	-0.009	0.134	0.894	Accepted
H4: Structure as measured using market structure has an effect on performance which is reflected in sustainable economic performance mediated by conduct.	0.225	4.070	0,000	Accepted

Sources: Data processed (2022)

## 4. DISCUSSION

H1a was carried out to test the influence of market structure on conduct proxied by financial performance. From the processing results, the estimated coefficient value is 0.465, which means that the higher the market structure (the more concentrated it is), the more conduct it will increase; the company's financial performance will increase. The p-value of the t statistic is 0.000 < 0.05 indicating that Ho is rejected and Ha is accepted so that the hypothesis that market structure affects conduct is proven to be positively significant. These findings align with an empirical study conducted by (H. N. Sari et al., 2019) showing that market structure using CR(4)

has proven to positively affect conduct in this case, profitability.

H1b was carried out with the aim of testing that COVID-19 moderates the influence of market structure on conduct which is proxied by financial performance. From the processing results, an estimated coefficient value of 0.058 is obtained, which means that the higher (more concentrated) market structure will further increase conduct, namely increasing the company's financial performance with COVID-19 as a moderating variable. The p-value of the t statistic is 0.500 > 0.05 indicating that Ho is accepted, so the hypothesis that COVID-19 moderates the influence of market structure on conduct is not proven. The results of this finding are in line with

an empirical study conducted by Cakranegara (2021) which shows that during the COVID-19 pandemic, banks that are included in the BUKU 4 group, namely those with the largest market share, have better financial performance compared to other BUKU banks.

H2a was carried out to test the influence of Structure on Sustainable Economic Performance. Processing results are indicated by an estimated coefficient value of 0.342, which means that an increasingly concentrated banking market structure will further enhance sustainable economic performance for banks. The t statistic value of 5,795 produces a p-value of 0.000 < 0.05, which means that Ho is rejected and Ha is accepted so that the hypothesis of a positive influence of market structure on Sustainable Economic Performance is proven. These findings align with empirical studies conducted by (Hossain et al., 2020; Syachfuddin & Rosyidi, 2017) which found that market share significantly affects banking financial performance.

H2b was carried out with the aim of testing that COVID-19 moderates the influence of market structure on Sustainable Economic Performance. The processing results obtained an estimated coefficient value of 0.025, which means that the higher (more concentrated) market structure will further improve the company's Sustainable Economic Performance with COVID-19 as a moderating variable. The p-value of the t statistic is 0.776 > 0.05 indicating that Ho is accepted, so the hypothesis that COVID-19 moderates the effect of market structure on conduct is not proven. The results of this finding are in line with an empirical study conducted by (Baldwin & Di Mauro, 2020) that the banking sector is one of the sectors affected by the COVID-19 pandemic. During the COVID-19 19 pandemic, banking was very vulnerable to the effects, because debtors from various industrial sectors who were affected experienced problems in carrying out their obligations, such as paying off debts, which in turn would affect the banking business in the future, especially from an economic perspective.

H3a aims to test the effect of Conduct on Sustainable Economic Performance. Processing results are indicated by an estimated coefficient value of 0.484, which means that an increase in Conduct, namely the company's financial performance will increase Sustainable Economic Performance for the company and conversely, a decrease in Conduct (Financial Performance of the Company) will reduce Sustainable Economic

Performance for the company. The p-value of the t statistic is 0.000 < 0.05 so that Ho is rejected (Ha is accepted) so that it can be concluded that the company's Conduct (Financial Performance) is capable of increasing Sustainable Economic Performance for banking companies. The results of these findings are in line with empirical studies which yield findings that financial performance, namely leverage (DER) and ROA, has proven to have a significant effect on firm value (Ulfa & Asyik, 2018).

H3b was carried out with the aim of testing that COVID-19 moderates the effect of Conduct (Financial Performance) on Sustainable Economic Performance. The processing results obtained an estimated coefficient value of -0.009, which means that the higher (more concentrated) market structure will further reduce the company's Sustainable Economic Performance with COVID-19 as a moderating variable. The p-value of the t statistic is 0.894 > 0.05 indicating that Ho is accepted so that the hypothesis that COVID-19 moderates the effect of Conduct on Sustainable Economic Performance is not proven. The results of these findings are in line with empirical studies conducted by (Baldwin & di Mauro, 2020), the condition of the COVID-19 19 pandemic where banks are very vulnerable to being affected, especially related to bad credit problems (Baldwin & di Mauro, 2020).

H4 was carried out with the aim of testing the existence of Conduct mediating the effect of Structure on Performance. The processing results are indicated by an estimated coefficient value of 0.225, which means that an increased structure is proxied by an increase in market share and an increasingly concentrated market, which will increase the company's conduct through market power. owned by the company and will ultimately affect the company's performance, namely the performance of a sustainable banking economy. The p-value of the statistical t is 0.000 < 0.05 indicating that Ho is rejected and Ha is accepted so that it can be concluded that Conduct mediates the positive effect of Structure on Performance.

## 5. CONCLUSION

From the research findings described above, the following are some conclusions that can be drawn. The market structure and map of banking competition in Indonesia in the 2018-2021 period is an oligopoly market where state-owned banks and BCA are market leaders in the banking

industry in Indonesia. There are five influential hypotheses. First, market structure has proven to have a significant positive effect on conduct, namely the financial ratios of banks in Indonesia. Second, market structure has a significant effect on banking performance. Third, Conduct reflected in financial performance significantly affects banking performance (sustainable economic performance). Fourth, the COVID-19 pandemic moderated the influence of conduct reflected in financial performance on banking performance (sustainable economic performance). Fifth, structure as measured using market structure influences performance which is reflected in sustainable economic performance mediated by conduct (financial performance).

The findings of this study indicate that market structure has proven to have a direct or indirect effect on sustainable economic performance mediated by conduct. The findings also show that each bank's market share is dominant in shaping the market structure compared to the Herfindal Index. The managerial implication of these findings is that banking authorities must always maintain money market stability, one of which is maintaining money market stability through control over competitive interest rates. Government policies that support sustainable business in terms of sustainable practices in economic, social, environmental, and governance aspects must have started to be implemented by every bank so that it can evaluate and estimate the prospects of the banking business in the long term.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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## APPENDIX

### Appendix 1. Banking listed on Indonesian stock exchange

No	Kode	Nama	Tanggal Pencatatan	Papan pencatatan
1	AGRO	Bank Raya Indonesia Tbk.	08/08/2003	Utama
2	AGRS	Bank IBK Indonesia Tbk.	22/12/2014	Pengembangan
3	AMAR	Bank Amar Indonesia Tbk.	09/01/2020	Pengembangan
4	ARTO	Bank Jago Tbk.	12/01/2016	Pengembangan
5	BABP	Bank MNC Internasional Tbk.	15/07/2002	Pengembangan
6	BACA	Bank Capital Indonesia Tbk.	04/10/2007	Pengembangan
7	BANK	Bank Aladin Syariah Tbk.	01/02/2021	Pengembangan
8	BBCA	Bank Central Asia Tbk.	31/05/2000	Utama
9	BBHI	Allo Bank Indonesia Tbk.	12/08/2015	Pengembangan
10	BBKP	Bank KB Bukopin Tbk.	10/07/2006	Utama
11	BBMD	Bank Mestika Dharma Tbk.	08/07/2013	Utama
12	BBNI	Bank Negara Indonesia (Persero	25/11/1996	Utama
13	BBRI	Bank Rakyat Indonesia (Persero	10/11/2003	Utama
14	BBSI	Bank Bisnis Internasional Tbk.	07/09/2020	Pengembangan
15	BBTN	Bank Tabungan Negara (Persero)	17/12/2009	Utama
16	BBYB	Bank Neo Commerce Tbk.	13/01/2015	Utama
17	BCIC	Bank JTrust Indonesia Tbk.	25/06/1997	Pengembangan
18	BDMN	Bank Danamon Indonesia Tbk.	06/12/1989	Utama
19	BEKS	Bank Pembangunan Daerah Banten	13/07/2001	Pengembangan
20	BGTG	Bank Ganesha Tbk.	12/05/2016	Pengembangan
21	BINA	Bank Ina Perdana Tbk.	16/01/2014	Utama
22	BJBR	Bank Pembangunan Daerah Jawa B	08/07/2010	Utama
23	BJTM	Bank Pembangunan Daerah Jawa T	12/07/2012	Utama
24	BKSW	Bank QNB Indonesia Tbk.	21/11/2002	Pengembangan
25	BMAS	Bank Maspion Indonesia Tbk.	11/07/2013	Pengembangan
26	BMRI	Bank Mandiri (Persero) Tbk.	14/07/2003	Utama
27	BNBA	Bank Bumi Arta Tbk.	01/06/2006	Utama
28	BNGA	Bank CIMB Niaga Tbk.	29/11/1989	Utama
29	BNII	Bank Maybank Indonesia Tbk.	21/11/1989	Utama
30	BNLI	Bank Permata Tbk.	15/01/1990	Utama
31	BRIS	Bank Syariah Indonesia Tbk.	09/05/2018	Utama
32	BSIM	Bank Sinarmas Tbk.	13/12/2010	Utama
33	BSWD	Bank Of India Indonesia Tbk.	01/05/2002	Pengembangan
34	BTPN	Bank BTPN Tbk.	12/03/2008	Utama
35	BTPS	Bank BTPN Syariah Tbk.	08/05/2018	Utama
36	BVIC	Bank Victoria International Tb	30/06/1999	Utama
37	DNAR	Bank Oke Indonesia Tbk.	11/07/2014	Utama
38	INPC	Bank Artha Graha Internasional	23/08/1990	Utama
39	MASB	Bank Multiarta Sentosa Tbk.	30/06/2021	Pengembangan
40	MAYA	Bank Mayapada Internasional Tb	29/08/1997	Utama
41	MCOR	Bank China Construction Bank I	03/07/2007	Utama
42	MEGA	Bank Mega Tbk.	17/04/2000	UTAMA
43	NISP	Bank OCBC NISP Tbk.	20/10/1994	Utama
44	NOBU	Bank Nationalnobu Tbk.	20/05/2013	Utama
45	PNBN	Bank Pan Indonesia Tbk	29/12/1982	Utama
46	PNBS	Bank Panin Dubai Syariah Tbk.	15/01/2014	Utama
47	SDRA	Bank Woori Saudara Indonesia 1	15/12/2006	Utama



**Appendix 2. Banking listed published the annual report**

No	Kode	Nama	Tanggal Pencatatan	Papan pencatatan
1	AGRO	Bank Raya Indonesia Tbk.	08/08/2003	Utama
2	BABP	Bank MNC Internasional Tbk.	15/07/2002	Pengembangan
3	BACA	Bank Capital Indonesia Tbk.	04/10/2007	Pengembangan
4	BBCA	Bank Central Asia Tbk.	31/05/2000	Utama
5	BBKP	Bank KB Bukopin Tbk.	10/07/2006	Utama
6	BBMD	Bank Mestika Dharma Tbk.	08/07/2013	Utama
7	BBNI	Bank Negara Indonesia (Persero	25/11/1996	Utama
8	BBRI	Bank Rakyat Indonesia (Persero	10/11/2003	Utama
9	BBTN	Bank Tabungan Negara (Persero)	17/12/2009	Utama
10	BCIC	Bank JTrust Indonesia Tbk.	25/06/1997	Pengembangan
11	BDMN	Bank Danamon Indonesia Tbk.	06/12/1989	Utama
12	BEKS	Bank Pembangunan Daerah Banten	13/07/2001	Pengembangan
13	BJBR	Bank Pembangunan Daerah Jawa B	08/07/2010	Utama
14	BJTM	Bank Pembangunan Daerah Jawa T	12/07/2012	Utama
15	BKSW	Bank QNB Indonesia Tbk.	21/11/2002	Pengembangan
16	BMAS	Bank Maspion Indonesia Tbk.	11/07/2013	Pengembangan
17	BMRI	Bank Mandiri (Persero) Tbk.	14/07/2003	Utama
18	BNBA	Bank Bumi Arta Tbk.	01/06/2006	Utama
19	BNGA	Bank CIMB Niaga Tbk.	29/11/1989	Utama
20	BNII	Bank Maybank Indonesia Tbk.	21/11/1989	Utama
21	BNLI	Bank Permata Tbk.	15/01/1990	Utama
22	BSIM	Bank Sinarmas Tbk.	13/12/2010	Utama
23	BSWD	Bank Of India Indonesia Tbk.	01/05/2002	Pengembangan
24	BTPN	Bank BTPN Tbk.	12/03/2008	Utama
25	BVIC	Bank Victoria International Tb	30/06/1999	Utama
26	INPC	Bank Artha Graha Internasional	23/08/1990	Utama
27	MAYA	Bank Mayapada Internasional Tb	29/08/1997	Utama
28	MCOR	Bank China Construction Bank I	03/07/2007	Utama
29	MEGA	Bank Mega Tbk.	17/04/2000	UTAMA
30	NISP	Bank OCBC NISP Tbk.	20/10/1994	Utama
31	NOBU	Bank Nationalnobu Tbk.	20/05/2013	Utama
32	PNBN	Bank Pan Indonesia Tbk	29/12/1982	Utama
33	SDRA	Bank Woori Saudara Indonesia 1	15/12/2006	Utama

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