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Determinants of BPR Competitiveness in New Normal Era: Empirical Study in Indonesia

ABSTRACT

As the rural bank in Indonesia, Bank Perkreditan Rakyat (BPR) serves people with limited products and services and is less regulated compared to Commercial Banks. During the COVID-19 pandemic, the growth rate of BPR slowed down. We developed a hypothesis on the negative influence of financial technology (fintech) on the competitiveness and performance of BPR. Using all BPR companies and 22 Fintech Lending companies as samples to measure the HHI and Lerner Index, we found that BPR and Fintech Lending companies were competing in an unconcentrated market. Several variables could not be examined while studying the determinants of BPR's competitiveness, including Regional GDP, BOPO, third party funds, Loan Credit, ROE, NIM, and CAR. Several determinants, such as the NPL, Fintech Lending, and COVID-19 pandemic, were found to have significant negative impacts on the BPR's competitiveness. Interestingly, BPR's banking digitalisation, as represented by its IT capability, was found to be not significant in this study.

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1. Introduction

Based on Law Number 10 of 1998 on Banking (Indonesian Banking Law), the Indonesian banking structure consists of Conventional Bank and Sharia Bank. Each type of bank is divided into Commercial Bank and Rural Bank (BPR). BPR serves as a financial intermediary for the micro and small business segments. It is only allowed to carry out basic banking intermediation activities, including collecting public funds in the form of savings and deposits, as well as disbursing funds in the form of credit. Based on the Banking Law, banks operating as BPR do not provide any payment transaction services.

BPR has an important role in the Indonesian economy. It is very much needed by the community, especially small and medium-sized businesses, which may not be able to access services offered by Commercial Bank. BPR's locations are spread throughout Indonesia, including in rural areas, with the total number reaching 1,506 companies as of December 2020. In carrying out its business activities, BPR applies local wisdom and personal approaches to customers to form their brand image and customer engagement. This is an added value of BPR, especially for small and medium-sized businesses.

Since early 2020, the COVID-19 pandemic has been ravaging the world in an unprecedented manner. Efforts to prevent the spread of the pandemic have caused the world economy to contract quite deeply, especially since the second quarter of 2020, including in Indonesia, which recorded economic growth of -5.32% in the period. The pandemic has been affecting almost all sectors, including the financial services sector.

During the second quarter of 2020, the BPR industry still showed a fairly good intermediation function, with credit and third-party funds (DPK) growing at 5.59% (YoY) and 5.37% (YoY), respectively. The Capital Adequacy Ratio (CAR) in June 2020 increased compared to the previous year from 22.78% to 30.80%. These high CAR ratios showed that the ability of rural banks to absorb risk was still relatively strong. However, credit risk increased, as seen from the increase in the ratio of gross Non-Performing

Loans (NPL) and net NPLs from 7.25% and 5.58%, respectively, to 8.44% and 6.58%. The profitability ratio was still maintained. However, the Return on Assets (ROA) ratio decreased from 2.37% to 1.98%, while the Operating Costs to Operating Income (BOPO) ratio increased from 82.34% to Rp. 84.78%.

The effect of the COVID-19 pandemic continued during the second semester of 2020. The safe and soundness indicators of the BPR industry stay the same even though the business growth was slowing. The intermediation function slowly decreased, as seen through the growth of credit and third-party funds (DPK) at 1.8% (YoY) and 3.5% (YOY), respectively. In December 2020, the BPR industry's CAR, NPL, ROA, and BOPO survived at 28.89%, 7.22%, 1.87%, and 84.24%, respectively.

In addition to short-term challenges, such as the COVID-19 pandemic, the BPR industry also faces external challenges that weaken its competitiveness in the financial services industry, such as changes in community behaviours, Information Technology (IT) developments in the financial sector, and competition with other financial service companies (Lembaga Jasa Keuangan/LJK). Other conditions, such as stringent limitations in payment systems, slow technology adaptation, and suboptimal implementation of risk management, have further weakened BPR's competitiveness. Limited capital for IT and human resources improvement also negatively impacts its competitiveness. New initiatives in these critical aspects can improve the performance and quality of BPR products and services, as well as address the inadequate implementation of good governance practices.

Currently, most of BPR's business processes are carried out face-to-face and manually, while its products and services are relatively limited. These limitations negatively impact the performance and BPR's competitiveness, especially in the New Normal era.

Wasiaturrahma et al. (2020) found indications that both BPR and BPR Syariah (BPRS) companies are inefficient in carrying out the intermediation function but have been efficient in terms of production. Both are positively influenced by their CAR and the location of their offices. BPR and BPRS

companies operating in urban areas tend to have low efficiency, though higher than those in rural areas. Capital also has a positive influence. The higher the capital is, the more efficient they will be.

Hamada (2010) explained that BPR companies are commercial microfinance institutions aimed at driving the regional economy. According to his study on microfinance companies in Indonesia, BPR competes directly with 1) commercial banks that have micro banking business units, 2) savings and loan cooperatives, and 3) Baitul Mal wat Tamwil companies (BMT).

In contrast, based on the study of Shadow Banking (DPNP, 2020), particularly regarding the influence of other financial companies on BPR profitability, it was concluded that Peer-to-Peer Lending (P2P Lending) company is one of financial technology (Fintech Lending) company that significantly reduces the profitability of BPR. The reason could be the increasing use of Information Technology (IT) by the public and the rise of IT-based financial service companies (such as Fintech Lending), which compete with BPR in providing financial services for MSMEs and communities in their respective operational areas.

As part of the national banking system, BPR is expected to play a greater role in the economic activities in regional areas, especially as the intermediary to facilitate microfinance needs.

BPR's market is the low-income households as well as micro and small businesses that are not reachable by commercial banks. Strategies to develop BPR are needed to improve its performance and competitiveness. As such, the root challenges and problems faced by BPR should be identified, and suitable strategies should be formulated. It would be interesting if the internal and external factors affecting BPR's performance and competitiveness can be defined, along with strategies to grow the industry in the New Normal era. The results of this study are expected to serve as recommendations to formulate policies for developing and strengthening BPR in increasing its role during the recovery of the Indonesian economy in the New Normal era.

Our findings confirmed the findings of previous studies that BPR competes with Fintech Lending. Moreover, the NPL, Growth of average loan of Fintech Lending, and impact of the COVID-19 pandemic had significant negative impacts on the BPR's competitiveness. Interestingly, while the demand for digitalisation of banking, including BPR, increases, IT as a variable in this study turned out to be not significant.

This study started with a literature review on BPR's competitiveness related to the level of industry competition, including identification of competitiveness, as well as factors that encourage competition and their impact on BPR performance. The level of competition was calculated using a market power approach with the Lerner Index. The Lerner Index is a widely used measure of market power in the economic literature (Shaffer and Spierdijk, 2020). The quantitative analysis was conducted to measure the performance of BPR using several variables obtained from the BPR's financial report. The data used in the calculation of this research was secondary data originating from the monthly reports of BPRs, Fintech Lending, and commercial banks submitted to the OJK (the Indonesia Financial Service Authority).

A discussion was performed on the primary data derived from the result of a survey on the use of Information Technology in BPR operations, products, and services, as well as the results of Focus Group Discussions (FGD) with several BPR companies, IT providers, and BPR association. At the end of the discussion, the findings of the study were concluded and compiled into policy recommendations.

The paper is organised as follows. Section 2 discussed literature reviews on the competitiveness and performance of BPR. Several papers on the competition between BPR and Fintech Lending industries will be explained in a detailed manner in this section. Section 3 explained the data and methodology used in this study. Section 4 discussed the results, and Section 5 presented the conclusion.

2. Literature Review

A. Competitiveness

According to Porter (1998), competitiveness is "the ability or advantage used to compete in a particular market." Competitiveness is created through continuous development in all parts of the organisation, especially in the production sector. The strategy chosen by the organisation should align with its competitive advantages.

In the last decade, studies on the level of banking competition have identified the competition and discussed the impact of competition on bank performance. In their research, Schaeck and Iháková (2008) showed that competition can stimulate banks to be more efficient by creating competitive prices or prices equal to the marginal cost in a perfectly competitive market.

The basic technique to measure competition is using the Concentration Ratio (CR) and Herfindahl-Hirschman Index (HHI) in structural competition. HHI of market concentration is the sum of squared market shares of all companies competing in a market or industry. According to Liu et al. (2013) in Claessens & Laeven (2004) and Tabak et al. (2012), structural measurements (i.e., CR and HHI) are widely used in the empirical measurement of the banking industry due to their ease of use (Claessens & Laeven, 2004; Gujarati, 2009).

Non-structural competition measurement, an approach that measures the level of competition directly based on various indicators of bank behaviour (Fadloli & Chalid, 2017), is an alternative to measure market competition.

Examples of non-structural competition measurement model are the Lerner index, the Panzar Rosse's H-statistical model, and the Boone Indicator. These models directly measure the company's response to competitors or changes in the market. The Lerner Index has the advantage of being able to estimate the market power of a bank within the banking

industry, as required in this study. According to Arrawatia et al. (2015), the Lerner Index measures market strength by looking at the difference between price and marginal cost. Several studies have used the Lerner Index to try to determine trends in banking competition behaviour over time. The Lerner index is expressed in the following formula:

$$L_{it} = \frac{P_{it} - MC_{it}}{P_{it}} \quad (1)$$

where P (price) is the average price or bank income (i.e. total revenue divided by total assets), and MC (marginal cost) is the total marginal cost calculated from the estimated trans-logarithmic cost function, where the total cost depends on the prices of the three inputs (savings, labor, and operations).

The Lerner Index has been applied in various studies to measure market strength in the banking sector. The Lerner Index calculates the difference between price and marginal cost and expresses it as a percentage of the price. A higher Lerner Index value implies a low level of bank competition. Bolt & Humphrey (2015) study the competitiveness of the banking market for consumer financing in the United States by comparing the results of the Competition Efficiency (CE) measure with other competition measurements, such as HHI, Lerner Index, and H-Statistic. Using the CE measure, the most and least competitive banks are not located in the most populous states and areas with few major bank offices. Overall, HHI is not recommended.

B. Performance and Factors Affecting Competitiveness

Every financial institution, including BPR, is required to maintain good financial performance, especially its profitability so that its business prospects continue to grow.

The soundness of BPR is based on the assessment of various aspects that affect its performance, comprising capital, asset quality, earnings, liquidity, and management, which is known as the CAMEL. Other theories and studies related to performance measurements, such as BOPO, ROA,

Total Assets, CAR, Core Capital, and others, can also be used as factors that affect BPR performance. Schaeck and Iháček (2008) argued that competition between banks can have a positive effect on soundness through transmission efficiency.

Several financial ratios can be used to measure the BPR performance. The Cash Ratio (CR) measures its liquidity and the Loan to Deposit Ratio (LDR) measures its ability to channel credit from third-party funds. The Return on Assets (ROA) is a comparison between profit before tax with the average total assets in a period and measures the level of business efficiency and profitability achieved by the bank, while the Return on Equity (ROE) measures its ability to provide a share of profits for its owners.

The Capital Adequacy Ratio (CAR) shows how its assets that contain risks (credit, investments, securities, and claims on other banks) are financed by the bank's core capital funds and external funds, such as public funds, loans (debt), and others. The CAR value shows the ability of bank capital to bear the risk of managing its assets. The BOPO ratio is a comparison between operating costs and operating income to measure the level of efficiency in carrying out its core business activities. The smaller the BOPO value is, the more efficient the BPR will be in running its business. The Non-Performing Loan (NPL) is a ratio that shows the ability of the BPR's management to manage non-performing loans from the total loans disbursed by it.

Several studies have been conducted to measure the level of banks' competition within the banking sector and its relation to bank performance and efficiency. Wong et al. (2007) found that market structure as measured by market concentration and bank market share are not a significant determinant of bank performance. Furthermore, cost efficiency is positively correlated with bank profitability and negatively correlated with borrowing costs. A study by Fadloli & Chalid (2017) showed a decline in the level of competitiveness in the Indonesian banking industry. It also showed that large banks face a lower level of competition compared to medium or small banks. Schäfer et al. (2010) concluded that the level of bank competition has a positive correlation with the level of

bank financing for Medium Small Enterprise (MSE) as measured by the volume of new lending without affecting the repayment discipline.

Using the Generalised Method of Moments (GMM) analysis, a study by Awo & Akotey (2019) showed that the financial performance of rural banks in Ghana is significantly influenced by banks' liquidity management, capital, and size of banks that expand its intermediation operation to rural households and micro-enterprises.

Wasiaturrahma et al. (2020) found indications that both BPR and BPR Syariah are still not efficient in performing the intermediation function but are efficient on the production side. According to their research, BPR and BPR Syariah, both are positively influenced by the CAR and their location (operational area).

Trinugroho et al. (2018) found the banking competition, as measured by the Lerner Index and banking density, shows a negative relationship with the BPR's viability. The owner's involvement in its management was found to reduce its viability. The age of the BPR also has an effect. More "established" BPR companies are more likely to survive compared to newly operating ones. Socio-economic and socio-political factors at the regional level have a significant effect on the survival of BPR companies.

C. Impact of the Use of Technology on Competitiveness and Performance

Digital disruption in the financial sector is driven by factors on the supply side, mostly technological developments, as well as on the demand side, along with changes in consumer expectations of service (OECD, 2020). Indonesia might also experience the same issue. One of the arguments emerging in various online seminars on digital banking and the digital economy between 2020 to 2021, is that banks should pay attention to the technological issues, both on products and services they offer (supply side) and customers' transactions that need to be executed through financial transactions (demand side) to survive.

An online joint publication by the People's Bank of China (PBOC) and World Bank (2018) showed that China has become a global fintech leader as the result of many innovative new entrants to the Chinese financial sector offering new models, delivery channels, and products. Many innovations leverage the massive scale and network of online e-commerce and social media platforms. The rapid growth of Fintech companies in China was due to their ability to tap into unmet demand of consumers and medium-small companies that were often neglected by many financial service providers.

If the situation in Indonesia is similar to China, it will align with what Navaretti et al. (2017) stated in their study that fintech companies offer the same products and services as banks but are more efficient due to the use of technology.

D. BPR Competitiveness Against Financial Technology Companies

Tan, Yong (2017) analysed the effect of shadow banking on the profitability of commercial banks, as well as the effect of competition based on the type of banking market in China. This study showed that factors affecting the profitability of commercial banks in China are credit risk, bank size, overhead costs, bank diversification, GDP growth, and shadow banking. Shadow banking was found to have a significantly positive impact on the profitability of commercial banks in China, as measured by the ROA and NIM ratios.

In Indonesia, OJK - DPNP (2020) used the Generalised Method of Moments (GMM) method in its unpublished study to determine the impact of shadow banking on BPR industry. In its study, OJK - DPNP (2020) used ROA (profitability), CAR (Capitalisation), CR (liquidity), NPL (Credit Risk), Overhead Expense/TA, and Non-interest Income/Gross Revenue as Bank specific variables; Other financial companies (microfinance/LKM, financing companies, Fintech Lending, Mekaar Loan of PT PNM, micro-loan of Pegadaian, and insurance) as Shadow Banking industry variable, and GDP growth as Macroeconomic variable. The data used are from 2016 to the first quarter of 2020. The result of this DPNP's study showed that all shadow

banking companies, except Fintech Lending, were significant and positive towards BPR's profitability. The bigger the shadow banking has been, the more profitable the BPR is. Since Fintech Lending is significant and negative towards BPR's ROA, the tight competition between BPR and Fintech Lending in distributing loans does exist.

Dinh et al. (2020) presented an empirical framework for testing their hypothesis that Fintech companies have a negative effect on bank performance in Indonesia. They augmented the conventional model from the literature that estimates the determinants of bank performance with the Fintech variable.

In their panel data regression, Hoang, Dinh et al. (2020) used NIM, ROA, ROE, and YEA (Yield on Earning Asset) to measure PER (performance). The estimation method used the two-step GMM system dynamic panel estimator. Samples are Fintech companies established in Indonesia during 1998–2017 that applied innovative technology to perform tasks previously reserved for banks, such as lending, payments, and other tasks, including new methods of payments, asset management services, and investment. From a range of different models, Hoang, Dinh et al. (2020) affirmed that Fintech negatively and significantly impacts all four banks' performance measures.

3. Data and Methodology

To obtain a strategy to strengthen the BPR industry, the scope of a specific BPR competitiveness analysis was carried out on Fintech Lending, bearing in mind that based on OJK DPNP research (2020), the existence of Fintech Lending has a significant negative impact on BPRs' ROA. Both secondary data for statistical analyses, and primary data from survey were used in this research. The framework of thought underlying this study is as follows:

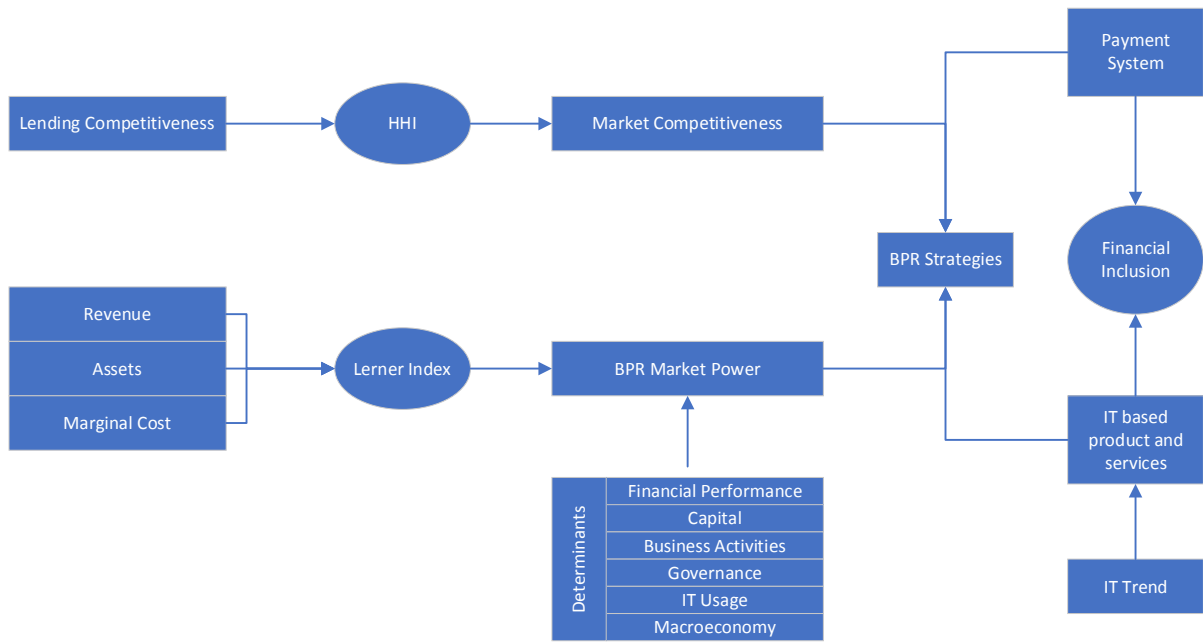


Figure 1. The Conceptual Framework

Data for this study was gathered from various methods. For analytical statistics, data for 1,506 BPR companies (100%) were taken from the BPR Enterprise Data Warehouse (EDW) in OJK that processes BPR companies' monthly report. Meanwhile, data for 22 Fintech Lending companies (comprising 70% of total loan distribution) were taken from working units that regulate and supervise them. Data for analysing competitiveness with a structural approach (Herfindahl-Hirschman Index (HHI)) were taken from 2013 to April 2021, whereas data for the non-structural approach (Lerner Index) were taken from December 2017 to December 2020. Data used for variables needed to analyse determinants affecting the BPR's market power were taken from December 2017 to December 2020. In addition to statistical data, for descriptive analysis, primary data related to IT and products were gathered from 172 BPR companies through questionnaires.

As a start, we calculated the Herfindahl-Hirschman Index (HHI) by using the model in Bikker & K. Haaf (2002) as follows:

$$HHI = \sum_{i=1}^n s_i^2 \quad (2)$$

In this model, s is the total loan or credit from each BPR and Fintech Lending company, while n is the amount of sample of BPR dan Fintech Lending companies.

Having obtained the HHI, the second statistical analysis will be performed with the Lerner Index as shown in equation (1) to measure the market power of BPR and Fintech lending companies by comparing output pricing and marginal cost.

Unfortunately, since the business model of Fintech Lending brings borrowers and investors to meet in the platform owned by the Fintech Lending companies, there is no data on interest cost and interest income. Therefore, to get the Marginal Cost (MC) data, the estimation regression from the translog cost function with OLS excludes the interest cost of the loans distributed by the financial companies (both BPR and Fintech Lending companies). The following was the estimation regression for the translog cost function:

$$\begin{aligned} \log(C_{it}) = & \alpha + \beta_1 \log(Q_{it}) + \beta_2 (\log(Q_{it}))^2 + \beta_3 \log(W_{1,it}) + \beta_4 \log(W_{2,it}) \\ & + \beta_5 \log(Q_{it}) \log(W_{1,it}) + \beta_6 \log(Q_{it}) \log(W_{2,it}) + \beta_7 (\log(W_{1,it}))^2 \\ & + \beta_8 (\log(W_{2,it}))^2 + \beta_9 \log(W_{1,it}) \log(W_{2,it}) + \sum_{t=1}^{T-1} \gamma_t D_t + \varepsilon_{it} \end{aligned} \quad (3)$$

With variables as follows:

- C_{it} : total cost/ total loan;
- Q_i : total loan;
- $W_{1,it}$: ratio human resource expense / total loan;
- $W_{2,it}$: (ratio operational expense and other expense) / total loan;
- D_t : variable dummy year;
- e_{it} : is idiosyncratic error.

Regression was estimated by running a pooled OLS and applying coefficient restriction.

After the beta/coefficient value was estimated, the Marginal cost was calculated by using this formula:

$$MC_{it} = \frac{C_{it}}{Q_{it}} [\beta_1 + 2\beta_2 \log(Q_{it}) + \beta_6 \log(W_{1,it}) + \beta_7 \log(W_{2,it}) + \beta_8 \log(W_{3,it})] \quad (4)$$

After that, the Lerner Index was calculated for all the samples at the same time.

Although we could not include the interest cost and interest income in calculating the Lerner index of the BPR - Fintech Lending companies, the index will still be beneficial for analysis, since according to Martin Cihak et al. (2012), an increase in the Lerner index indicates a decrease in competition.

After the Lerner index of each BPR and Fintech Lending company in the ecosystem of combined BPR – Fintech Lending was calculated, the second and third Lerner indexes were calculated. The second Lerner Index is for measuring the market power of each Fintech Lending company within the Fintech Lending industry. The third Lerner Index is for measuring the market power of each or individual BPR company within the BPR industry.

For the calculation of the third Lerner index, the estimation regression for translog cost function will be as follows:

$$\begin{aligned} \log(C_{it}) = & \beta_1 \log(Q_{it}) + \beta_2 (\log(Q_{it}))^2 + \beta_3 \log(W_{1,it}) + \beta_4 \log(W_{2,it}) + \beta_5 \log(W_{3,it}) + \\ & \beta_6 \log(Q_{it}) \log(W_{1,it}) + \beta_7 \log(Q_{it}) \log(W_{2,it}) + \beta_8 \log(Q_{it}) \log(W_{3,it}) + \\ & \beta_9 (\log(W_{1,it}))^2 + \beta_{10} (\log(W_{2,it}))^2 + \beta_{11} (\log(W_{3,it}))^2 + \\ & \beta_{12} \log(W_{2,it}) \log(W_{1,it}) + \beta_{13} \log(W_{3,it}) \log(W_{2,it}) + \\ & \beta_{14} \log(W_{1,it}) \log(W_{3,it}) + \sum_{t=1}^T \alpha_{1,t} D_t + \varepsilon_{it} \end{aligned} \quad (5)$$

With variables as follows:

C_{it} : total costs (sum of interest cost and non-interest cost BPR i on year t);

Q_{it} : total asset BPR i on year t ;

$W_{1,it}$: ratio of interest cost compared to total liability BPR i on year t ;

$W_{2,it}$: ratio human resource cost compared to total asset BPR i on year t ;

- $W3,it$: ratio administration cost dan other operational cost compared to total asset BPR i on year t ;
- Dt : variable dummy.

The next step in this study was seeking the determinant factors to competitiveness and performance of BPR. In order to know what factor is the most influential to the competitiveness and performance of a BPR, a Lerner Index was calculated only with BPR data (without data from Fintech Lending), to be used as a dependent variable within the model of performance analysis as follows:

$$L_{it} = \beta_0 + \beta_1 BC_t + \sum \beta_h MC_{it} + error \quad (6)$$

The independent variables in this model are:

- BC : a group of variables at BPR-level;
- MC : a group of macro-level variables that could influence the third-party fund obtained and the distributed loan.

The following shows the detail of the independent variables:

Table 1. Variable Definition for Determinants Model

No	Parameter	Variable
1	Financial performances	Non-Performing Loan (NPL), Net Interest Margin (NIM), Operational Costs on Operational Revenues (BOPO), Return on Asset (ROA), Return on Equity (ROE)
2	Capital	Capital Adequacy Ratio (CAR), Common equity/Core Capital
3	Growth of Business Indicators	Ln Total asset, third party funds growth, Loan distributed Growth
4	Management Capability	Dummy the fulfillment of the requirement of number of Directors and Commissaires
5	Information Technology usage/expense	Dummy the ownership of IT based products and the investment on IT
6.	Macro economy	Real Gross Domestic Product (GDP) Growth
7	The impact of other industry on BPRs' business	Number of Fintech Lending companies, Growth of loan distributed by Fintech Lending companies

In addition to analysis using secondary data from the monthly report submitted by each BPR company, this study analysed primary data obtained by a survey on 172 BPR companies (represented 70% of all BPR total asset). Discussions were then conducted with several of respondents to get deeper insight. The criteria of respondent BPR companies for the survey was the following:

1. Financing or investing in fixed asset inventory related to IT or IT-based products and services,
2. Having a licence for issuing ATM cards, or
3. Using other party as IT service provider.

The 172 BPR as the sample for survey are all of BPRKU3 (common equity/core capital at least IDR50,000,000,000), some of BPRKU2 (common equity/core capital of IDR15,000,000,000 < IDR50,000,000,000) from Western Indonesia, Central Indonesia, and Eastern Indonesia, and samples of BPRKU1 from all big islands in Indonesia.

4. Results and Analysis

A. Herfindahl-Hirschman Index (HHI)

Using the Herfindahl-Hirschman Index (HHI) and Lerner Index, this study showed the competitiveness of BPR within the BPR industry and within the combined BPR-Fintech Lending industry.

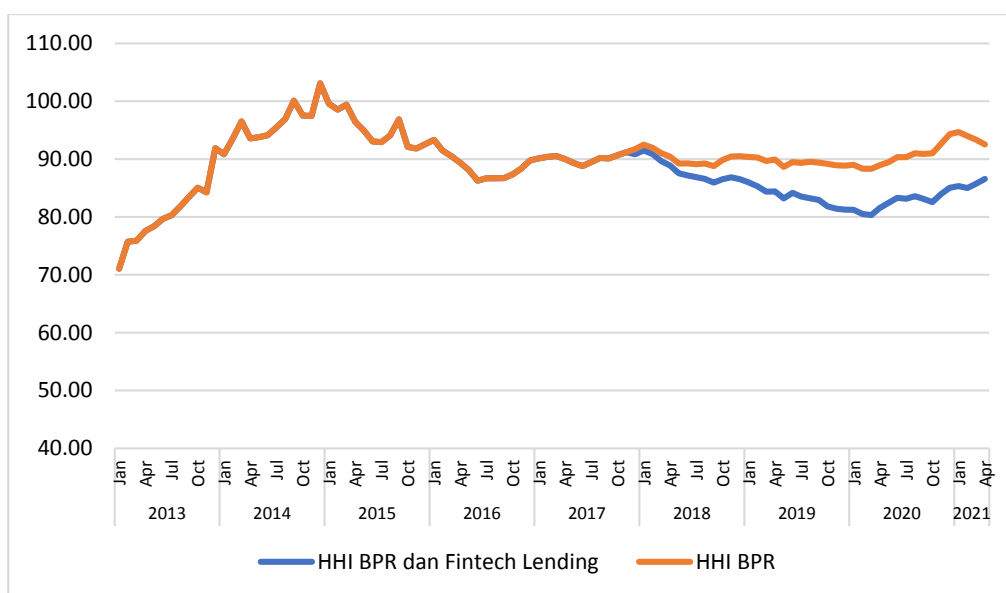


Figure 2. Result of Herfindahl-Hirschman Index (HHI)

Based on the results of the calculation of HHI, the BPR market is competitive or has a low concentration with the HHI value of < 1500 . According to the US Horizontal Merger Guidelines 2010, $HHI < 1500$ indicated that the market of BPR or Fintech Lending is unconcentrated.

Assuming that BPR companies and Fintech Lending companies are operating in the same ecosystem, and because the data gathered for Fintech lending started from December 2017, the HHI for that ecosystem was calculated from 2017 to April 2020. The result remains the same, that BPR industry is unconcentrated. It means that the market for BPR is competitive, either in BPR industry or the combined BPR and Fintech Lending industries.

B. Lerner Index

After running translog regression to obtain MC for calculating the Lerner index using the BPR industry data (1,506 BPR companies) on Stata, one variable was found to be not significant. After using VCE(Robust), heteroscedasticity on residual distribution was found with one variable that has $P > 0$ (i.e., 0.886). Therefore, the sample was reduced to 1,472 BPR companies to ensure that all the data was analysed effectively.

Based on the calculation on 1,472 BPR and 22 Fintech Lending companies' data from December 2017 to December 2018, approximately 258 to 341 BPR companies (almost 20% of the BPR industry) have a negative Lerner Index every year. Within this group, more BPRKU1 showed a negative Lerner Index compared to BPRKU 2 and BPRKU 3.

A negative Lerner Index shows that the marginal costs incurred by a BPR company to conduct its business are higher than its additional income. This is in line with the facts in the market that most depositors put their money in BPR companies to gain higher interest rates compared to those from big commercial banks. Moreover, almost all BPR companies offer flexibility to their big customers to withdraw their deposits before the due date. The following is a graph showing the average Positive Lerner Index at each month during the observation period.

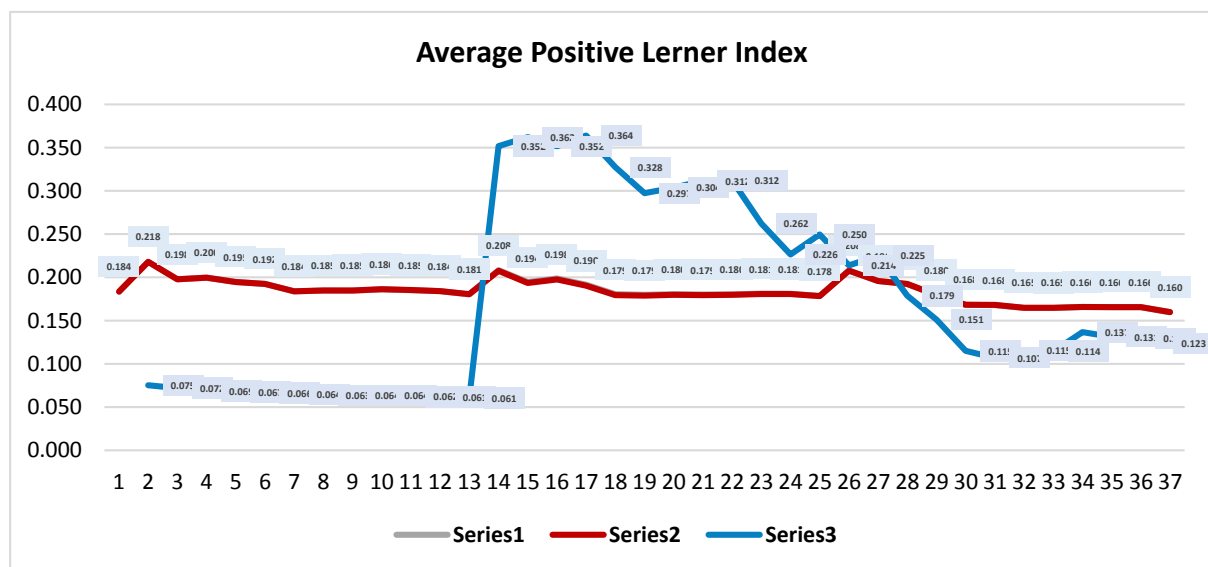


Figure 3. Result of Lerner Index

In general, BPR companies with positive Lerner Index indicate that they have market power, both within the BPR industry and within the combined BPR-Fintech Lending industry. Moreover, we can confirm that there is a competition between BPR and Fintech Lending companies.

C. Determinants of BPR Competitiveness Using Lerner Index as Dependent Variable

First, the models mentioned in the Data and Methodology section to measure the determinants of market power in the BPR industry were run with all the variables (26) mentioned in the same section using a two-step GMM estimation. The samples used for this first run were all of BPR samples, with both positive and negative Lerner indexes (a total of 1,472 BPR companies).

Then second run was then done for each sub-sample with 26 variables: the first sub-sample (BPRKU 1), the second sub-sample (BPRKU 2), and the third sub-sample (BPRKU 3).

Based on the results of all the runs of the model on Stata using the two-step GMM estimation method, several variables were taken out due to collinearity. From the remaining variables, a new more robust model was formed as follow:

$$LIBPR_{it} = \beta_0 + \beta_1 LIBPR_{i,t-1} + \beta_2 ROA_{it} + \beta_3 NPL_{it} + \beta_4 LNMI_{it} + \beta_5 GOVDK_{it} + \beta_6 GALFLM_t + \beta_7 GCOV_t + \beta_8 IIT_{it} + \mu_{it} \quad (7)$$

- $LIBPR_{it}$: Lerner Index of the respective BPR i at year t
- $LIBPR_{i,t-1}$: Lerner Index of the respective BPR i at year $t-1$
- ROA_{it} : Return on Asset of the respective BPR i at year t
- NPL_{it} : Non-Performing Loan of the respective BPR i at year t
- $LNMI_{it}$: Natural logarithm of common equity of the respective BPR i at year t
- $GOVDK_{it}$: Dummy variable for number of director and board of commissioner required of the respective BPR i at year t
- $GALFLM_t$: Growth of average loan distribution Fintech Lending Industry at year t (MTM)
- $GCOV_t$: Growth of number covid cases in Indonesia at year t (MTM)
- IIT_{it} : Dummy variable for IT investment of the respective BPR i and ATM as BPR's product & service at year t
- μ_{it} : Error

The Lerner Index of individual BPR (either positive or negative) was used as dependent variable to estimate the determinant variable of its

competitiveness by taking the growth of another industry (Fintech Lending) and the impact of the COVID 19 pandemic into account. The model was run to regress the 1,472 BPR companies on Stata using two step GMM estimation method with the following result:

Table 2. Result of Descriptive Statistic

Variable	Definition	Obs	Mean	Std.Dev	Min	Max
LIBPR	Lerner Index BPR	53,441	0.0762	0.2173	-0.9993	9336661
ROA	Earning after tax to total asset	53,342	2.29902	4.43686	-21.21	15.04
NPL	Non-Performing Loan	53,348	10.8142	8.25047	0	42.49
INMI	Natural logarithm of common equity	53,775	15.7397	1.08216	12.6516	20.48231
GOVDK	Dummy variable for number of director and board of commissioner required	54,464	0.70948	0.45401	0	1
GALFLM	Growth of average loan distribution Fintech Lending (MTM)	51,520	1.94216	15.5809	-36.151	34.16436
GCOV	Growth of covid cases (MTM)	13,248	129.633	157.885	31.4067	562.1728
IIT	Expenses for IT	54,464	0.11821	0.32286	0	1

Table 3. Correlation Matrix – All Samples

	libpr	roa	npl	Inmi	GOVDK	galflm	gcov	IIT
LIBPR	1							
ROA	0.774	1						
NPL	-0.4253	-0.3784	1					
INMI	0.4485	0.3683	-0.2657	1				
GOVDK	0.1306	0.1365	-0.1651	0.164	1			
GALFLM	0.0107	0.0001	-0.0077	0.0041	-0.0003	1		
GCOV	0.024	0.0184	0.0038	-0.0056	0.0019	-0.136	1	
IIT	0.1955	0.1053	-0.1159	0.4918	-0.0035	-0.000	0.000	1

- The correlation matrix value between all of the independent variables used are not exceed the rule of thumb multicollinearity test by Gujarati (2009). According to Gujarati, multicollinearity is indicated when the correlation value is more than | 0.9|.

Table 4. Table Regression Estimation Result – All Samples

Variable	LIBPR
LIBPRt ₁	0.869289*** (0.0253036)
ROA	0.0046894*** (0.0009142)
NPL	-0.0005847*** (0.0001084)
INMI	0.0039105*** (0.0011865)
GOVDK	0.0006592 (0.001491)
GALFLM	-0.0004295*** (0.0000507)
GCOV	-0.0000268*** (0.0000034)
IIT	0.0004654 (0.0014412)
<u>AR(2)</u>	0.059
<u>Hansen</u>	0.057

Note: (***), (**), and (*) represent significance at 1%, 5% and 10%, respectively.

Table 4 presents the estimation result from running the panel data using the two-step GMM approach, which indicates:

1. Lag of Lerner Index BPR (LIBPRt-1), Return on Asset (ROA), and Common Equity (INMI) have a strong positive relationship on Competition Dependent Variable (Lerner Index BPR/LIBPR).
2. On the other hand, The Non-Performing Loan (NPL), Growth of average loan distribution of Fintech Lending (GALFLM), and growth of COVID-19 cases (GCOV) have significant negative impacts on competition. This means that BPR companies must put more effort into mitigating the potential decline in value caused by Fintech Lending activities and the deteriorating business climate due to COVID-19 if they do not wish their market power to decrease.
3. Two other variables, IT expense (IIT) and number of director and board of commissioner (GOVDK), are not significant on

competition. This means even though BPR companies do not follow the requirements for directors and commissioners in their bank, their market power in obtaining more profitable business from depositors and borrowers is not significantly affected.

The insignificance of IT needs to be tested further. This variable represents the benefits of investing in IT software and hardware, as well as in IT-based products, such as ATM cards, which will have an impact on the required steps to reduce the impacts of Fintech and the COVID-19 pandemic.

Next, to find out the application of the model to BPRKU1, BPRKU2, and BPRKU3, as well as to test the robustness of the model with a two-step GMM estimate, sub-sample data from BPR companies were tested one by one. The test results are as follow:

Table 5. Table Regression Estimation Result – Sub Samples

Variable	(1) LIBPR	(2) LIBPR	(3) LIBPR
LIBPR _{t-1}	0.8666799*** (0.0279748)	0.817544*** (0.0669189)	0.771702*** (0.0854909)
ROA	0.0048539*** (0.0010389)	0.0062923*** -0.002216	0.0067078** (0.002712)
NPL	-0.0006089*** (0.0001392)	-0.0002974* (0.0001613)	-0.0011692 *** (0.000415)
INMI	0.0038675*** (0.0011339)	0.0059373* (0.0034632)	0.0135731** (0.0066902)
GOVDK	-0.0003654 (0.0016099)	0.0057921 (0.0036383)	0.005965 (0.007176)
GALFLM		-0.0004502*** (0.0001079)	-0.000628*** (0.0001699)
GCOV	-0.0000341*** (0.0000037)	-0.0000195*** (0.000007)	-0.0000128 (0.0000109)
IIT	0.0009681 (0.0018025)	0.0024708 (0.0034312)	-0.0149855 (0.010149)
AR(2)	0.185	0.421	0.119
Hansen	0.120	0.335	0.211

Note: (***), (**), and (*) represent significance at 1%, 5% and 10%, respectively.

Notes: (1) BPRKU1, (2) BPRKU2, (3) BPRKU3

The table above shows that the lag of BPR Lerner Index, ROA, NPL, common equity, and IT expense has similar results in all samples. Meanwhile, growth of average loan distribution of Fintech Lending, growth of COVID-19 cases in Indonesia, and number of director and commissioner show different results.

To make the table more understandable, we summarised the result as follow:

Table 6. Summary of Estimation Result

Variable	All sample	BPRKU 1	BPRKU 2	BPRKU 3
LIBPR _{t-1}	(+) Sig	(+) Sig	(+) Sig	(+) Sig
ROA	(+) Sig	(+) Sig	(+) Sig	(+) Sig
NPL	(-) Sig	(-) Sig	(-) Sig	(-) Sig
LNMI	(+) Sig	(+) Sig	(+) Sig	(+) Sig
GOVDK	Insig	Insig	Insig	Insig
GALFLM	(-) Sig		(-) Sig	(-) Sig
GCOV	(-) Sig	(-) Sig	(-) Sig	Insig
IIT	Insig	Insig	Insig	Insig

The table shows that there is no relationship between the Growth of average loan distribution of Fintech Lending and BPRKU1. The GALFLM variable was removed after the model was run with Dynamic panel-data estimation using two-step system GMM. The GMM estimator of the model transformed by the orthogonal deviation equation work better here than that transformed by the first difference. Therefore, the model for BPRKU1 becomes slightly different from the model for all samples, sub-sample BPRKU2 and sub-sample BPRKU3. The model for BPRKU1 is as follows:

$$LIBPR_{it} = \beta_0 + \beta_1 LIBPR_{i,t-1} + \beta_2 ROA_{it} + \beta_3 NPL_{it} + \beta_4 LNM_{it} + \beta_5 GOVDK_{it} + \beta_6 GCOV_t + \beta_7 IIT_{it} + \mu_{it} \quad (8)$$

The result of this model shows that BPR companies with common equity or core capital less than IDR15,000,000,000 should pay attention to their last-year market power, ROA, NPL, common equity/core capital, the fulfillment of requirement on bank management, impact of COVID-19, and investment on IT in their fixed asset inventory or IT-based product and

services, as these variables are the determinants to their market power in developing their business. The BPRs should differentiate their focus on different determinant variables based on the degree of relationship and significance.

If we apply this result to one of the characteristics of BPRKU1, which has a limited area of operation and number of branches, then this type of BPR can focus its efforts on its comparative advantage by having collaboration with local governments or with cooperatives to support its program to develop micro and small businesses. It can leverage its knowledge of people or businesses within its operational area as one of the competitive advantages compared to BPRKU2 and BPRKU3 or commercial banks that are allowed to run their business in a wider area and have more branches than BPRKU1.

According to Moro and Fredriksson (2013), bank performance is a result of the margin that the bank can extract from each of its relationships with its customer. Generally, banks should be careful when evaluating a small business, however, small local banks can make the most use of informal information they can access through surrounding local communities. Moro and Fredriksson (2013) found that the length of a relationship with a customer is a relevant variable that is positively associated with risk-adjusted profitability.

Descriptive Analysis of Survey result. Based on the respondents' answers to the survey questionnaire and the discussion with several BPRs, some findings needed to be further explored, such as:

a. Telecommunication Network

Of the total respondents, 57% are in an area with good quality of telecommunication network, 42% with moderate quality, and 1% with poor quality. It means more than half of BPR companies are suitable for IT-based products and services, and less than half of the BPR companies need signal boosters or the government WiFi facility to enable them to serve their customers better.

- b. Utilisation of Information Technology Service Providers (PJTI) In general, the majority of BPR companies (89%) have utilised PJTI services, for both core activities such as servers, data centers, data recovery centers, core banking systems, and supporting hardware (such as ATMs, EDC, and other devices), as well as supporting applications (such as mobile banking applications). Since most banks with no experience with IT service provider contractors are not aware of the best practices, there is a need to have a regulator or bank association to provide consultation and/or to gather and disburse information.
- c. In general, only 30% of total respondents have IT-based products and services, with BPRKU3 occupies more than half of that proportion. The IT-based products were mostly in the form of EDC, ATM cards, and mobile applications. Approximately 41% were in the early phase or in the middle of developing IT products and services, while the rest (29%) has no any interest in having IT-based products and services due to limited infrastructure, scarcity of funds (especially to finance the capital expenditure), and the absence of supports from regulators for issues related to payment systems and banking supervision.
- d. EDC provided by the BPR (EDC on us). Currently, paying loans or depositing money in BPR is very difficult. Customers must either visit BPR companies' offices or send money through the BPR companies' accounts in commercial banks. These limitations created difficulties for BPR officers visiting customers since there was a time difference between the time of disbursing or receiving money with the time of b, processing, bookkeeping, or settling the transactions. Moreover, more transactions can be done digitally by people with their mobile phone applications. This obstacle may drive away customers from frequently using the bank's products and services.

5. Conclusion and Recommendation

A. Conclusion

The study found that based on the Herfindahl-Hirschman Index, the BPR industry is an unconcentrated (competitive) market. The market is even more competitive within the combined BPR-Fintech Lending ecosystem.

In measuring the ecosystem of the combined BPR - Fintech Lending, the study found that approximately 20% of BPR companies have a negative Lerner Index, which indicates the inability of those BPR companies to compete against other BPR and the Fintech Lending companies.

Several variables could not be examined for their relationship and impact on the BPR's market power, such as Regional GDP, BOPO, third party funds, Loan/Credit, ROE, NIM, and CAR.

The relationship between Growth of average loan distribution of Fintech Lending and BPRKU1 could not be examined as well.

The positive-significant effect of ROA and core capital and the negative-significant effect of NPL indicated that it is important for BPR companies to maintain their credit loan quality and profitability on total assets, as well as increase their capital.

The negative-significant effect of the average growth of Fintech Lending confirmed the findings of previous studies that Fintech development brings a negative impact on the BPR industry.

Although the statistical analysis shows that IT is not significant to the market power of BPR companies in the BPR industry (all samples, BPRKU1, BPRKU2, BPRKU3), based on the survey results and discussions with several banks and IT providers, the high quality of IT system in BPR companies will support their operational activities. Additionally, the BPR

industry's participation in the payment system can contribute to further business development of the BPR industry.

2. Recommendation

Further observation to the 20% of BPR companies with negative Lerner Index needs to be conducted to identify the causes and effects, such as pricing mechanism and marginal cost drivers.

The existing OJK policy on guidelines for cooperation between BPR and Fintech Lending needs to be supported by IT capabilities in BPRKU1 and BPRKU2 so that the factors causing NPL could still be identified during the visit to the debtor's location for credit analysis or monitoring of debt.

For further study on IT influence in the BPR's market power, the required monthly reports should be submitted, especially on Fixed Assets and IT-related inventory. Should a new BPR reporting system be implemented, the necessary details are required for submission, instead of merely the summary.

The upcoming OJK policy to remove the relation between the size of capital and BPR products and services needs to be supported by factors that can facilitate BPR companies in obtaining the APMK license from Bank Indonesia, such as the availability of quality vendors at affordable prices.

The knowledge of people or businesses within the operational area of BPRKU1 should be optimised by exploiting informal information they can access through the local communities and developing cooperation with local government and local businessmen.

The need for BPRs to operate on EDC transactions to avoid customers' hesitancy for doing transactions with BPR should be supported by the payment system's regulator and banking supervisor.

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