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AND THE 4<sup>th</sup> INTERNATIONAL CONFERENCE  
ON BUSINESS AND BANKING INNOVATIONS**

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# The 4<sup>th</sup> ICOBBI

*The Strategy of Digital in Business  
for Gaining Competitive Advantages after Pandemic*



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“The Strategy of Digitalization in Business for Gaining Competitive  
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## FOREWORD

Alhamdulillah, praise be to Allah Subhanahu Wa Ta'ala for granting us the opportunity to organize and publish the proceedings of the 4<sup>th</sup> International Conference on Business and Banking Innovations (ICOBBI) with the topic "The Strategy of Digitalization in Business for Gaining Competitive Advantages after Pandemic". This proceeding contains several researches articles from many fields in Business & Marketing, Banking & Sharia Banking, Accounting & Financial Management, Human Resources Management, Operations Management, Investasi, Insurance & Capital Market, Strategic Management, Technology Management, and Information System.

The 4<sup>th</sup> International Conference on Business and Banking Innovations was held on 29<sup>th</sup> January 2022 by virtual (online) zoom meeting and organized by the Master Management Study Program of Universitas Hayam Wuruk Perbanas in Collaboration with five Higher Education Institutions in Indonesia and three Universities from Asia countries. Keynote speakers in this conference were: Chonlatis Darawong, P.hD (Sripatum University, Thailand), Associate Prof. Dr. Elisha Nasrudin (University of Science, Malaysia), Dr. Sanju Kumar Singh (Postdoctoral Fellowship in Universitas Airlangga, Tribhuvan University Nepal) and Prof. Dr. Abdul Mongid, MA., P.hD (Universitas Hayam Wuruk Perbanas, Indonesia).

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Hopefully, the proceeding will become a reference for academics and practitioners, especially the business and banking industry to get benefit from the various results of the research field of Business and Banking associated with Information Technology. Proceedings also can be accessed online on the website <http://eprints.perbanas.ac.id/>

Chair of the Master Management Study Program  
Universitas Hayam Wuruk Perbanas

**Prof. Dr. Tatik Suryani, M.M.**



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# Determinants of Indonesian Banking Profitability

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## ABSTRACT

This study aims to investigate determinants of Indonesian banking profitability. The determinants of banking profitability are bank specifics and macroeconomic indicators. This study uses balanced panel data involving 18 banks in Indonesia for the period 2009-2019. The research method used is panel regression method. Empirical findings indicate that bank specifics, such as bank liquidity and capital, have a positive and significant effect on banking profitability, while the cost-to-income ratio and leverage has a negative and significant effect on banking profitability. Macroeconomic indicators, such as interest rates boost bank profitability. On the other hand, the results of this study indicate that the exchange rate reduces profitability. This study also reveals that credit risk, inflation and GDP have no significant effect on profitability. The results of this study have considerable implications for policy. The government needs to regulate inflation, exchange rates, and interest rates. Policy makers need to increase bank liquidity and capital to increase banking profitability. Furthermore, policy makers need to regulate efficiency related to the cost-to-income ratio. The lower the cost-to-income ratio, the higher the profitability. This study is a unique investigation into the Indonesian banking industry that considers the simultaneous effects of bank specifics and macroeconomic indicators on banking profitability. The results of this study can help policy makers, governments, bankers, and bank managers to better understand the various determinants of bank profitability.

**Keywords:** Bank specifics; Macroeconomic; profitability; Indonesian Banking; Panel regression

## INTRODUCTION

Indonesia is one of the largest countries in Southeast Asia with a large population. With such a large population, there needs to be certainty of a good and stable financial system. People use banking for various needs. Therefore, they will always choose a sound bank to carry out their financial transactions. In creating sound banking, it is necessary to know the factors that influence the development of banking. One of the characteristics of a sound bank is having a lot of profit. Banking profitability can be influenced by several factors, such as internal and external factors. (Masood and Ashraf, 2012; Al-Harbi, 2019)

Internal factors that affect banking profitability are bank specific, while external factors that affect banking profitability are macroeconomic indicators (Al-Homaidi et al., 2018; Al-Harbi, 2019). The internal factors include liquidity, capital adequacy, efficiency, credit risk, efficiency, deposits, expenses, and bank size (Yüksel et al., 2018). According to Hunjra et al. (2020), Internal factors that affect profitability are the amount of credit, liquidity, and operational risk. Meanwhile, external factors that affect profitability include economic growth / GDP, exchange rates, inflation, taxes, and interest rates (Al-Homaidi et al. 2018).

Regarding the factors that affect profitability, several studies have produced different research results. According to Messai, Gallali, and Jouini (2015); Alhempri and Zainal (2016); Majumder and Li (2018); Ebenezer et al (2017), capital ratio has a positive effect on profitability. However, the results of research conducted by Al-Jafari and Alchami (2014) and Al-Homaidi et al. (2018) show that capital adequacy has no effect on profitability. Liquidity has a positive effect on profitability (Messai et al., 2015; Yüksel et al., 2018). However, according to Al-Jafari and Alchami (2014), liquidity has a negative effect on profitability.

this study adds to the literature on banking profitability in Indonesia. Third, this study uses a static panel data, with panel regression method. The formulation of the problem in this study is as follows:

1. How do bank specific, as banking internal factors, affect banking profitability?
2. How do macroeconomic indicators, as banking external factors, affect banking profitability?

This research is expected to be useful for academics, researchers, and policy makers because of its contribution to the current literature. This study consists of five parts, introduction, research methods, results, discussion, and conclusions.

## METHOD

This study uses secondary data obtained from the OJK website and the bankscope database (Majumder and Li, 2018). Bank specific are mainly obtained from the OJK website and the websites of each bank, while macroeconomic indicators are obtained from the websites of BI (Bank Indonesia) and BPS (Statistics of Indonesia).

Another internal factor that affects profitability is efficiency. Efficiency can be measured using two approaches, the traditional approach using cost-to-income ratio (BOPO) and the frontier approach (Khalifaturafi'ah, 2021). Efficiency as measured by traditional approach is obtained from cost-to-income ratio / CIR (BOPO), while the efficiency as measured by the frontier approach is obtained from the input and output. Regarding efficiency, several studies have produced different results. Management efficiency has a positive effect on profitability (Al-Jafari and Alchami, 2014). However, different results are shown in the research conducted by Ozili and Uadiale (2017), Khalifaturafi'ah (2018) that cost efficiency has a negative effect on profitability.

In addition to internal factors (bank specific), profitability is also influenced by external factors (macroeconomic indicators) (Derbali, 2021; Masood and Ashraf, 2012). One of the macroeconomic indicators that affect profitability is economic growth as proxied by GDP. GDP has a negative effect on profitability (Al-Jafari and Alchami 2014). However, according to Le and Ngo (2020), GDP growth has a positive effect on profitability. Inflation has a negative effect on profitability (Messai et al., 2015). However, according to Alhempri and Zainal (2016), inflation has a positive effect on profitability. The exchange rate is also a macroeconomic indicator that affects banking profitability. The results of research conducted by Al-Homaidi et al. (2018) show that the exchange rate has a negative effect on profitability. Other macroeconomic indicators that affect profitability are GDP, inflation, and interest rates.

Referring to the background above, this research is important to do considering the current economic conditions. First, this study will investigate one of the hot topics of banking financial performance. Second,

This study also uses documentation studies by documenting sources from journals, books, working papers, and data banks. This study uses balanced panel data from 18 banks during the period 2009-2019. Sampling was done using purposive sampling method with several criteria considered by the author. The criteria for the research sample include banks in Indonesia that reported complete financial statements for the period 2009-2019. In addition, banks that are the research sample must also be included in BUKU 3 and BUKU 4.

This study investigates the effect of bank specific and macroeconomics on profitability at conventional banks in Indonesia. This study uses three simultaneous equations models which are in accordance with previous research (Dietrich and Wanzenried, 2011; Al-Homaidi et al., 2018; Derbali, 2021; Khalifaturafi'ah, 2021) as follows:

$$ROA_{it} = \beta_0 + \beta_1LDR_{it} + \beta_2CAR_{it} + \beta_3LAR_{it} + \beta_4NPL_{it} + \beta_5BS_{it} + \beta_6GDP_t + \beta_7INFT + \beta_8SB_{it} + \beta_9NT_t + \epsilon_{it}$$

In the models above,  $i$  indicates the cross section, namely bank,  $t$  indicates time, and  $\varepsilon_{it}$  indicates the error term which includes the effect of the bank specific which is not observed and the error. The first model is used to examine the effect of bank specifics and macroeconomics on profitability as proxied by ROA. ROA $_{it}$  indicates the return on assets of each bank in a certain period;  $\beta_0$  is a constant;  $\beta_1 - \beta_9$  is the regression coefficient; LDR is loan to deposit ratio; CAR is capital adequacy ratio; NPL is non performing loan; LAR loan to asset ratio; BS is bank size; GDP is gross domestic product; INF is inflation; SBI is interest rate; and exchange rate. The definition of variables and the direction of the expected coefficients are presented in Table 1 and Table 2.

**Table 1. Description of the variables used in the study**

Variable	Symbol	Definition	Reference
<b>Dependent Variable</b>	ROA	Net income to total asset	Derbali (2021); Dietrich and Wanzenried (2011); Ha (2020); Al Homaidi et al (2018); Khalifaturofi'ah (2021)
<b>Independent Variable</b>	Liquidity Capital	Loan to deposit	Khalifaturofi'ah (2021); Hunjra et

Adequacy ratio	Capital Adequacy Ratio	al (2020) Majumder and Li (2017); Alshatti (2016)
Credit Risk	Non Performing	Ha (2020); Hunjra et al (2020)
Efficiency	Loan Cost to Income Ratio	Dietrich and Wanzenried (2011)
Asset Quality	Loan to asset ratio	Menicucci and Paolucci (2015)
Bank Size	Ln Total Aset	Menicucci and Paolucci (2015)
Economic growth	GDP	Al Harbi (2019)
Inflation	Annual inflation rate	Masood dan Ashraf (2012); messai et al (2015)
Interest rate	SBI interest rate	Al Homaidi et al (2018)
Exchange rate	interest rate Middle rate	Al Homaidi et al (2018)

Source: Processed data, 2021

**Table 2. Summary of the effect independent**

Variable	Profitability	Citation
<b>Bank specific</b>		
Liquidity (LDR)	+/-	Al Homaidi et al (2018); Derbali (2021)
Capital Adequacy (CAR)	+/-	Majumder and Li (2017); Albulescu (2015), Messai et al (2015)
Credit risk (NPL)	+/-	Majumder and Li (2017)
Efficiency (CIR)	-	Khalifaturafi'ah (2021)
Asset quality (LAR)	+/-	Albulescu (2015); Majumder and Li (2017)
<b>Macroeconomic indicator</b>		
GDP	+/-	Al Homaidi et al (2018); Yuksel et al (2018); Le and Ngo (2020)
Inflation	+/-	Alhempri and Zainal (2016); Derbali (2021)
Interest rate	+/-	Al Homaidi et al (2018)
Exchange rate	+/-	Al Homaidi et al (2018)

Source : Processed data, 2021

The analytical method used in this study is the panel data regression method. There are two kinds of panel data regression: static panel data regression and dynamic panel data regression. Static panel data regression is a regression with a general panel data structure. Static panel data regression includes several stages of testing, including selecting the best model. There are three models in panel regression: Pooled

The selection of the best model is done through a series of tests: (1) F-test. This test is used to select the best model whether to use the Common Effect Model or the Fixed Effect Model; (2) Hausman Test. This test is used to select the best model whether to use the Fixed Effect Model or the Random Effect Model; (3) Lagrangian Multiplier Test / LM Test. This test is used to select the best model whether to use the Random Effect Model or the Common Effect Model.

## RESULTS

This study uses annual financial report data derived from reports published by the Financial Services Authority (OJK) website and annual reports issued by each bank. The object of research is conventional banks in Indonesia. This research is a continuation of previous

## variable to profitability

Least Square model (Common Effect Model), Fixed Effect Model, and Random Effect Model.

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## RESULTS

This study uses annual financial report data derived from reports published by the Financial Services Authority (OJK) website and annual reports issued by each bank. The object of research is conventional banks in Indonesia. This research is a continuation of previous research that discusses cost efficiency and financial innovation in conventional banks.

This study emphasizes more on the factors that affect banking profitability in Indonesia, from both banking internal and external factors. The research sample is taken based on purposive sampling method, consisting of conventional banks which are included in banks **BUKU 3 and 4**. The independent variables used in this study are banking internal factors or bank specifics consisting of financial ratios (CAR, LDR, LAR, NPL, and CIR) and banking external factors or macroeconomic indicators (GDP, inflation with CPI, exchange rate, and SBI). The dependent variable used in this study is profitability (ROA). The following are descriptive statistics of the research sample

**Table 3. Descriptive Statistics**  
Source : Processed data, 2021

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Table 3 illustrates the descriptive statistics of the variables used in this study. Table 3 also describes the minimum, maximum, mean, median, and standard deviation values of the dependent and explanatory variables. These results illustrate the trend of profitability as measured by using the ratio of ROA, ROE, and NIM for the period 2009-2019. The variables of bank specifics and macroeconomic indicators are also explained for the same period, from 2009 to 2019. The results explain that ROA, ROE, and NIM are 1.95, 14.06, and 5.17 with the standard deviations of 1.26, 9.60, and 2.16. The average value which is greater than the standard deviation indicates that the data is homogeneous with relatively small data deviation. LDR, CAR, NPL, CIR, and LAR have an average value of 86.04, 17.45, 1.26, 79.99, and 64.56, with standard deviations of 18.35, 4.45, 0.99, 14.71, and 7.27.

From the variable of macroeconomic indicators, GDP has a minimum value of 4.63 and a maximum value of 6.22, with an average value of 5.34. Inflation, which is indicated by the CPI, has a minimum value of 2.72 and a maximum value of 8.38, with an average value of 4.58. The interest rate, as measured by SBI (BI Certificate), has a minimum value of 4.25 and a maximum value of 7.75, with an average value of 6.14. The exchange rate has a minimum value of IDR 8,991/\$ and a maximum value of IDR 14,481/\$, with an average value of IDR 11,901.73/\$.

According to correlation, from the variable of bank specifics, the results show that LDR, NPL, CIR, and LAR have a negative correlation with ROA. This shows that LDR, NPL, CIR and LAR have a negative correlation with bank profitability in Indonesia. The variable of CAR has a positive correlation with ROA. For the variable of macroeconomic indicators, all macroeconomic indicators have a positive correlation

ROE, and NIM have a minimum value of -4.89, -38.33, and 0.05 and a maximum value of 5.15, 43.83, and 13.97, with an average value of 2.07, 14.57, and 5.47. ROA and ROE show a negative skewness distribution value during the period 2009-2019. The average values of

Variables	Minimum	Maximum	Mean	Median	Std. Dev.	
<b>Panel A : Profitability measurements (dependent variables)</b>						
ROA	-4.89	5.15	2.07	1.95	1.26	
<b>Panel B : Bank specific determinants (independent variables)</b>						
LDR	0.96	171.32	86.04	87.79	18.35	
CAR	0.21	35.55	17.45	16.96	4.45	
NPL	0.00	6.37	1.26	1.03	0.99	
CIR	0.83	150.77	79.99	81.78	14.71	
LAR	40.10	79.26	64.56	65.96	7.27	
<b>Panel C : Macro-economic determinants (independent variables)</b>						
GDP	4.63	6.22	5.34	5.07	0.53	
CPI	2.72	8.38	4.58	3.61	2.11	
SBI (BI certificate)	4.25	7.75	6.14	6.00	1.11	
EXCHANGE RATE	8,991.00	14,481.00	11,901.73	12,440.00	2,081.37	
with profitability, except for the exchange rate. GDP, CPI, and SBI (BI Certificate) have a positive correlation with ROA. On the other hand, the exchange rate has a negative correlation with ROA.						
GDP	0.17	0.31	0.14	0.19	0.14	0.18
CPI	0.02	0.59	0.03	0.26	0.03	0.28
SBI	0.18	<b>0.02</b>	0.13	<b>0.01</b>	0.14	<b>0.01</b>
LOG(EXCHANGE RATE)	-1.53	<b>0.00</b>	-1.68	<b>0.00</b>	-1.65	<b>0.00</b>
R-squared	0.62		0.85		0.58	
Adjusted R-squared	0.60		0.83		0.56	
Durbin-Watson stat	0.46		1.11		0.93	
F-statistic	33.81		37.21		29.17	
Prob(F-statistic)	0.00		0.00		0.00	
Chow Test			0.00			
Hausman test					0.00	
<b>The best model is fixed effect model</b>						

Dependent Variable	ROA					
	Pooled		Fixed		Random	
Variable	Coef.	Prob.	Coef.	Prob.	Coef.	Prob.
C	17.76	0.00	18.47	0.00	18.44	0.00
<b>Bank Specific Variables</b>						
LDR	0.02	<b>0.00</b>	0.03	<b>0.00</b>	0.03	<b>0.00</b>
CAR	0.10	<b>0.00</b>	0.06	<b>0.00</b>	0.06	<b>0.00</b>
NPL	-0.03	0.66	0.03	0.65	0.00	0.93
CIR	-0.07	<b>0.00</b>	-0.05	<b>0.00</b>	-0.06	<b>0.00</b>
LAR	-0.02	<b>0.04</b>	-0.02	<b>0.02</b>	-0.03	<b>0.01</b>
<b>Macroeconomic Variables</b>						

#### Tabel 4. Panel regression result

Table 4 shows the results of panel regression estimation using static panel method. The static panel method consists of three types of estimation models: pooled / OLS, fixed, and random. The table describes the estimates of each model of ROA, ROE, and NIM which are determined by bank internal variable (bank specifics) and bank external variable (macroeconomic indicators). Overall, these estimates reveal that the highest adj.R-squared value of ROA is in the fixed model at 0.83, followed by the pooled model at 0.60 and the random model at 0.56. This indicates that bank specifics and macroeconomic indicators contribute 83%, 60%, and 56% to profitability as measured by ROA.

As illustrated in Table 4 for the ROA model, the best selected model is fixed effect model (chow test and hausman test = 0.00). Based on fixed effect model, it is only the NPL variable that has no significant effect on ROA at the level of 5%. LDR and CAR ratios have a positive and significant effect on ROA at the level of 1% (p value = 0.00<0.01), while CIR and LAR have a negative and significant effect at the level of 1% (p value = 0.00<0.01) and 5% (p value = 0.04<0.05).

Based on the effect of the variable of macroeconomic indicators on profitability, Table 4 shows that interest rates and exchange rates have an effect on profitability as measured by ROA. Interest rates and exchange rates have a positive and significant effect on ROA.

#### DISCUSSION

Table 4 contains the results of panel regression on banking profitability in Indonesia with the dependent Albuiescu (2015), interest rates have a positive effect on profitability. However, according to Al-Homaidi et al. (2018), interest rates have a negative effect on profitability as proxied by ROE and NIM.

The exchange rate has a negative and significant effect on banking profitability as proxied by ROA. This means that the higher the value of the exchange rate (with the depreciation of the exchange rate), the lower the bank's profitability. These results are supported by the results of research conducted by Al-Homaidi et al. (2018) that the exchange rate has a negative effect on ROA and ROE. However, the results of research conducted by Saona (2016) show that the exchange rate has a positive effect on profitability.

#### CONCLUSION

This study discusses the effect of the variables of bank specifics and macroeconomic indicators on profitability in 18 conventional banks in Indonesia, which are included in BUKU 3 and BUKU 4 during the period 2009-2019. The independent variable of bank specifics consists of LDR, CAR, NPL, CIR, and LAR ratios.

#### Source : Processed data, 2021

variables of ROA. Based on Table 4, bank specifics that affect banking profitability are LDR, CAR, CIR, LAR. LDR and CAR have a positive effect on ROA at a significant level of 5% and 1%, while CIR and LAR have a negative effect on Macroeconomic indicators that affect profitability are interest rates and exchange rates. Interest rates have a positive and significant effect on ROA at a significant level of 5%. The exchange rate has a negative and significant effect on ROA at a significant level of 1%.

This is consistent with the results of research conducted by Messai et al. (2015); Al-Jafari and Alchami (2014) that the amount of credit provided by banks from their savings, capital adequacy, and bank size have a positive effect on profitability as measured by ROA. However, this is not in line with the results of research conducted by Yüksel et al. (2018) that the loan to GDP ratio has a negative effect on profitability. The CIR ratio has a negative coefficient, which indicates that the higher the CIR, the lower the ROA. The higher the costs incurred by the bank, the lower the bank's profitability (Ozili dan Uadiale, 2017; Khalifaturofi'ah, 2021)

In macroeconomic indicators, interest rates and exchange rates affect profitability as proxied by ROA. In the ROA model, inflation and GDP have no significant effect on ROA. It means that the movement of inflation and GDP has no significant effect on profitability. Interest rates have a positive effect on profitability as measured by ROA. This means that the higher the SBI interest rate, the higher the banking profitability from the use of total assets. According to

The independent variable of macroeconomic indicators consists of GDP, inflation, interest rates, and exchange rates.

Based on the discussion described above, it can be concluded that ROA is positively and significantly influenced LDR and CAR (variable of bank specifics), while ROA is negatively and significantly influenced by CIR and LAR. Macroeconomic indicators that positively affect ROA is interest rates, while the exchange rate has a negative and significant effect on ROA.

This research is able to fill the gap that discusses the banking profitability in Indonesia. The determinants of profitability in this study include two variables: bank specifics (banking internal), which include bank performance from within, and macroeconomic indicators (banking external), which include economic conditions, interest rates, inflation, and exchange rates. During 2009-2019 the development of banks in Indonesia has experienced an increasing trend, although there have been years when banks tended to decline.

It is recommended that the period be divided into phases. There are phases in which before the financial crisis and after the financial crisis may produce different results from this study. In addition, further research is suggested to consider using variables in management such as good corporate governance and the influence of management on profitability. Finally, it is necessary to add other countries in the study so that the macroeconomic variables are not the same in every bank.

This research is very useful to fill the gap related to the determinants of banking profitability, especially in Indonesia. For banking practitioners, it is necessary to pay attention to important points that can increase bank profitability, such as the amount of credit provided by banks from their total deposits and capital adequacy. The greater the liquidity and capital adequacy of a bank, the higher the bank's ability to generate profits.

The implication for the government as a policy maker is that it will be very important if the government pays attention to interest rates and exchange rates. Increased interest rates will also increase bank profitability. The exchange rate has a negative effect on profitability, the lower the value of the exchange rate (with the appreciation of the exchange rate), the higher the banking profitability. This is a signal for policy makers to be better in managing the financial system in Indonesia so that relations with the banking system are also good.

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