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ANALYSIS OF THE INFLUENCE OF DIGITAL PAYMENT SYSTEMS ON BANKING EFFICIENCY IN INDONESIA

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ABSTRACT

This study aims to analyze the effect of digital payment systems on banking efficiency in Indonesia. The population obtained based on purposive sampling in determining the sample. ATM has no effect on efficiency as measured by BOPO in the conventional banking sector for the 2017-2021 period, although there are differences in the average ATM variable in the period before the covid 19 pandemic (2018-2019) and after the covid 19 pandemic (2020-2021). EDC has an effect positive and significant effect on efficiency as measured by BOPO in the conventional banking sector for the 2017-2021 period, although there is a difference in the average EDC variable in the period before the covid 19 pandemic (2018-2019) and after the covid 19 pandemic (2020-2021). Internet Banking has a negative and significant effect on efficiency as measured by BOPO in the conventional banking sector for the 2017-2021 period although there is no difference in the average Internet Banking variable in the period before the covid 19 pandemic (2018-2019) and after the covid 19 pandemic (2020-2021). Interest rates which are the control variable in this study have a negative and significant effect on efficiency as measured by BOPO in the conventional banking sector for the 2017-2021 period and there is a difference in the average interest rate variable in the period before the covid 19 pandemic (2018-2019) and after the pandemic covid 19 (2020-2021). From the results of different tests on the variables used, namely BOPO, ATM, EDC and interest rates, it was found that there was an average difference in these variables in the period before the covid 19 pandemic (2018-2019) and after pandemic covid 19 (2020-2021). While on the Internet Banking variable from the results of the different test there is no difference in the average of these variables in the period before the covid 19 pandemic (2018-2019) and after the covid 19 pandemic (2020-2021)

KEYWORDS: Digital payments, ATM, EDC, BOPO, and Internet Banking.

INTRODUCTION

As information technology continues to develop, it has penetrated all aspects and sectors of human life globally, including in Indonesia. These conditions influence the development of the digital economy and finance, both as opportunities and challenges. The potential that Indonesia has to respond to these developments can be seen from its demographic bonus, namely a population of 270.2 million people, of which the number is dominated by the productive age population, namely between the ages of 15-64 years, amounting to 70.72% or 191.08 million people (www.bps.go.id, 2021). Apart from that, from the results of the 2017 World Bank survey, there are still around 51% of the population in the unbanked people category, which represents a large market potential to encourage digital economy and finance in Indonesia (Bank Indonesia, 2019). The things mentioned above are a strong enough foundation that can be used to encourage the acceleration of digitalization in Indonesia.

Digital Economy and Finance are increasingly developing along with the emergence of new actors, namely application provider companies operating in the financial technology sector, online transportation service providers and e-commerce companies that offer innovation and technological solutions in various services which have an influence on the development of digitalization in Indonesia. The development of digitalization in Indonesia is also showing increasing progress, especially during the Covid 19 pandemic which started from March 2020 until now. The policies issued by the Government to mitigate and reduce the impact of the Covid-19 pandemic, namely Large-Scale Social Restrictions (PSBB), aim to limit people's movements during the pandemic and recommend the use of online transactions for shopping and non-cash financial transactions in order to mitigate the spread of Covid-19. The condition of the development of payment system transactions in Indonesia as seen from the development of digital payment system transactions using various payment channels/instruments including using ATM, EDC and Internet Banking which shows a growth trend, especially seen in the period before the Covid 19 pandemic and during the Covid 19 pandemic. which is reflected in nominal transaction data during the 2018-2021 period. In the period before the Covid 19 pandemic, namely in 2018-2019, recorded growth in transactions using ATM, EDC and Internet Banking each amounted to 7.91% (yoy), (41 .78%) (yoy) and 21.19% (yoy). Meanwhile, transaction growth experienced fluctuations, namely in 2020 or in the initial period of the Covid 19 pandemic, namely transactions using ATM, EDC and Internet Banking payment channels, each of which experienced negative growth year on year (yoy), namely each of (7.46%), (43.98%) and (0.05%). Meanwhile in 2021 nominal transactions using Internet Banking were recorded at IDR 39,874,255 billion or grew by 45.70% (yoy), transactions using EDC were recorded at IDR 614,780 billion or grew by 68.01% (yoy) and transactions using ATMs were recorded at IDR 7,677,185 billion or grew by 10.99% (yoy).

This shows that there is acceleration, especially in transactions using non-cash/digital payment instruments/channels, which is in line with the statement of the President of the Republic of Indonesia at the 2020 ASEAN Business and Investment Summit which stated that the opportunity in the midst of the Covid 19 pandemic is the acceleration of the development of digitalization in various fields (https://setneg.go.id/, 2020) and also the statement by the Governor of Bank Indonesia in his remarks at the Launching of Aftech Annual Member Survey Report 2019/2020 on September 10 2020, saying that millennial users accelerated the digitalization of financial and payment systems during the pandemic (https://finansial.bisnis.com/, 2020). In 2019, Bank Indonesia issued the Indonesian Payment System Blue Print (BSPI) 2025 which contains 5 (five) Visions which are translated into 5 (five) initiatives, namely Open Banking, SP Retail (IPT Development, BI FAST, Expansion of GPN Services) , Development of Financial Market Infrastructure, Data, Regulation, Licensing and Supervision in order to prepare payment system infrastructure according to needs in order to accelerate efficient and inclusive digital economic and financial development. These five initiatives will be gradually implemented in the 2019-2025 period, where on 17 August 2019 QRIS was launched on 17 August 2019 which came into effect on 1 January 2020 with the number of merchants using QRIS as of February 2022 reaching 15,676,476 QRIS merchants .On the other hand, the Government also continues to encourage digitalization, namely by accelerating and expanding regional digitalization by issuing policies in the form of Presidential Decree (Keppres) no. 3. 2021, March 4 2021 concerning the Task Force for the Acceleration and Expansion of Regional Digitalization (P2DD Task Force). The formation of this task force is in the context of accelerating and expanding digitalization in the regions, especially in accelerating the implementation of Electronification of Regional Government Transactions (ETPD) and supporting the development of digital payment transactions, achieving financial inclusion and encouraging national digital economic and financial integration. The Presidential Decree also regulates the obligation to form Regional Digitalization Acceleration and Expansion Teams (TP2DD) both at the Provincial level and Regency/City level throughout Indonesia in connection with the implementation of ETPD within one year after the Presidential Regulation comes into force.

The Financial Services Authority (OJK) has published the 2020-2025 Indonesian Banking Development Roadmap (RP2I) in 2021. This RP2I consists of four development directions, namely strengthening structure and competitive advantage, accelerating digital transformation, strengthening the role of banking in the national economy, strengthening regulations, supervision and licensing. Several efforts have been made by several of the institutions mentioned above as an effort to comprehensively accelerate the integration of Indonesia's digital economy and finance by facilitating the digitization of transactions using connected digital payments.

This is important because the development of digitalization has brought drastic changes that give rise to opportunities, risks and challenges. Opportunities from the development of digitalization are encouraging inclusivity and electronification programs, including the electronification of regional government transactions, distribution of social assistance and the transportation sector, as well as banks starting to move towards digital. Apart from that, in terms of risks from the development of digitalization, namely the risk of shadow banking which tends to increase, the risk landscape is shifting and national interests are increasingly difficult to fulfill. The development of digitalization

is also an opportunity for economic equality where currently the economic concentration is still in Java and Sumatra with a share of approximately 80% of the national economic share. Apart from that, digitalization is also expected to have an impact on the emergence of efficiency both in terms of ease of transactions, costs and efficiency in terms of time in transactions so that transactions can be carried out faster, easier and cheaper.

METHOD

Study design

In this research, the data used is secondary data, which is data that has been obtained in a certain form and has been processed and collected by other parties in the form of publications (Yusi & Idris, 2019). The secondary data is in the form of time series data or pooling data on research variables. This data is published in Indonesian Banking Statistics by the OJK and Payment System Statistics published by Bank Indonesia.

Population and Sample

Population is a collection of all similar elements, but can be differentiated from one another (Supranto, 1994). In this research, the population used is the banking sector in Indonesia, both the conventional banking sector and the sharia banking sector operating in Indonesia. Sampling in this research was carried out using a purposive sampling approach, namely sampling based on certain considerations with requirements set as sample criteria to fulfill the aim of obtaining a representative sample (Sugiyono, 2004). The criteria for sample selection include the following:

1. The sample is the conventional banking sector in Indonesia with indicator data or financial ratios that reflect the efficiency of the banking sector in Indonesia published by the OJK in Indonesian Banking Statistics for the 2017-2021 period.
2. Data on the volume and nominal value of payment system transactions in Indonesia in aggregate published by Bank Indonesia in the 2017-2021 period.
3. The research data period used is the period when complete variable data is available according to the research variables.

Data collection

The research was carried out through secondary data collection in literature and manually through published data on the official websites of Bank Indonesia, OJK and from various other types of literature relevant to the research. Time series data is published in Indonesian Payment System Statistics published by Bank Indonesia and Indonesian Banking Statistics published by OJK.

Analysis Method

The analytical method used to determine the independent variables that significantly influence efficiency (BOPO), namely ATM, EDC, Internet Banking with the interest rate control variable using the general equation of multiple linear regression on 3 (three) independent variables and 1 (one) control variable on the dependent variable using the general multiple linear regression model, namely (Gujarati & Porter, 2010):

$$Y = \alpha + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X\ 3 + \beta 4\ K4 + e$$

Where :
Y: BOPO
α: Constant
β 1,2,3,4: Regression Coefficient Estimator
X 1: ATM
X2: EDC
X3: Internet Banking
K4: Interest Rate Control Variable
e: Residual variable (error rate)

RESULT

This Research result

This research aims to analyze the influence of ATM, Internet Banking and EDC and using interest rate control variables on banking efficiency in Indonesia as measured using BOPO. The research object in this study is the conventional banking sector operating in Indonesia during the 2017-2021 period.

Data analysis

Descriptive statistics

Variable description The description of the research variables in this research was carried out to provide an overview of the variables used in this research, namely the BOPO, ATM, EDC, Internet Banking and Interest Rate variables. This description will explain the minimum, maximum and average values for each variable used in this research. It can be seen that from the 60 observation data on the 5 (five) variables in this research it can be explained as follows:

1. BOPO has a minimum value of 77.86 and a maximum value of 88.84 with an average value of 82.1773 and a standard deviation of 2.95197.
2. ATM has a minimum value of 0.87 and a maximum value of 1.03 with an average value of 0.9382 and a standard deviation of 0.02920.
3. EDC has a minimum value of 0.00 and a maximum value of 0.00 with an average value of 0.0000 and a standard deviation of 0.0000.
4. Internet Banking has a minimum value of 0.0000001 and a maximum value of 0.0000003 with an average value of 0.000000210 and a standard deviation of 0.0000000730.
5. The interest rate has a minimum value of 3.5 and a maximum value of 6.00 with an average value of 4.6125 and a standard deviation of 0.83796.

Classic assumption test

Hypothesis testing in this research uses multiple linear regression analysis with the aim of obtaining a comprehensive picture of the influence of the independent variable on the dependent variable. Before carrying out multiple linear regression analysis, a classical assumption deviation test is first carried out with the following results.

Normality test

The Normality Test is carried out to test in the regression model whether the confounding or residual variables have a normal distribution (Ghozali, 2021). The normality test can be carried out with statistical tests using the Kolmogorov Smirnov (K-S) non-parametric statistical test. The

results obtained were that the K-S test statistic was 0.109, besides that the asymptotic significance level was above 0.05 (>0.05). These results indicate that in the regression model the confounding or residual variables are normally distributed.

Multicollinearity Test

The multicollinearity test is used to find out whether in the model there is a correlation between independent variables (Ghozali, 2021). If symptoms of multicollinearity occur, the regression coefficient values become less reliable and make it difficult to separate the influence of each independent variable on the dependent variable. To find out whether there is multicollinearity in the regression model, you can look at the tolerance value or Variance Inflation Factor (VIF). Where the tolerance value limit is 0.1 and the VIF value is 10 and if the tolerance value is <0.1 or the same as the VIF value > 10 then it indicates multicollinearity (Ghozali, 2021). It can be seen that there are no independent variables that have a tolerance value of less than 0 .10 (<0.10). Apart from that, the results of the VIF calculation also show the same results, namely that there are no independent variables that have a VIF value of more than 10. So from the results of the multicollinearity test above, it can be concluded that there is no multicollinearity between independent variables in the regression model, so in the regression model there is no correlation found. between independent variables.

Heteroscedasticity Test

This test is carried out to test whether in the regression model there is inequality in the residual variance from one observation to another (Ghozali, 2021). If the variance from the residual from one observation to another observation remains, it is called homoscedasticity and if it is different, it is called heteroscedasticity. In research, a good regression model is the Homoscedasticity model or whether Heteroscedasticity does not occur in the regression model. One way to detect the presence or absence of heteroscedasticity is through the Glejser Test by performing a regression on the absolute value of the residual on the independent variable. The results of the Glejser Test show that the ATM, EDC, Internet Banking and interest rate variables have a significance value of more than 0.05 (>0.05). This means that there are no cases of heteroscedasticity in the regression model and the heteroscedasticity assumption has been fulfilled so it can be concluded that the regression model is suitable for use in this research.

Autocorrelation Test

The autocorrelation test is carried out to find out or test that in the linear regression model there is a correlation between confounding errors for period t and the previous period (t-1). To carry out autocorrelation testing, it is carried out using the Durbin Watson mapping test. If the DW is located between du and 4-du from the table, it shows that the regression model does not contain any autocorrelation problems. The results obtained were that the Durbin Watson value for the dependent variable BOPO without control variables was 1.065, this shows that there is no autocorrelation problem in this research model. The results obtained were that the Durbin Watson value for the dependent variable BOPO with the control variable was 1.030, this shows that there was no autocorrelation problem in the research model. This can be seen from the Durbin Watson value which is between –2 to 2, namely with a value of 1,030 or -2 < 1,030 < 2 so it can be concluded that there is no case of autocorrelation and the autocorrelation assumption in this model can be fulfilled.

Multiple Regression Analysis

The results of classical assumption testing carried out on the regression equation can be concluded that the equation is suitable for use as a mathematical equation.

The results of testing the multiple linear regression equation with the dependent variable BOPO without control variables in this study are as follows:

Efficiency (BOPO) = α+β 1 ATM +β 2 EDC+β 3 Internet Banking + e

Efficiency (BOPO) = 84,311 – 8,573 ATM + 2853871,945 EDC – 21889586,965 Internet Banking+ e

From the regression equation above, an understanding can be obtained or can be concluded as follows:

a. The coefficient value of 84.311 in the regression equation shows that if the value of the ATM, EDC and Internet Banking variables is considered constant or fixed then the efficiency measured by BOPO is 84.311.
b. ATMs have it i the regression coefficient in a negative direction is -8.573, this means that every increase of 1 unit in the ATM variable will cause BOPO to decrease by 8.573 units.
c. EDC has a regression coefficient in a positive direction, namely 2853871.845, this means that every 1 unit increase in the EDC variable will cause BOPO to increase by 2853871.845 units.
d. Internet Banking has a regression coefficient in a negative direction, namely 21889586.965, this means that every 1 unit increase in the Internet Banking variable will cause BOPO to decrease by 21889586.965 units.

The results of testing the multiple linear regression equation with the dependent variable BOPO and the interest rate control variable in this study are as follows:

BOPO = α+β 1 ATM +β 2 EDC+β 3 Internet Banking + 4 Interest Rates + e

BOPO= 94,966 – 11,570 ATM + 2185842,391 EDC – 9911397,122 Internet Banking – 1,032 Interest Rate + e

From the regression equation above, an understanding can be obtained or can be concluded as follows:

a. The coefficient value of 94.996 in the regression equation shows that if the variable values for ATM, EDC, Internet Banking and Interest Rates are considered constant or fixed then the efficiency measured by BOPO is 94.996.
b. ATM has a regression coefficient in a negative direction, namely -11,570. This means that every 1 unit increase in the ATM variable will cause BOPO to decrease by 11,570 units.
c. EDC has a regression coefficient in a positive direction, namely 2185842.391. This means that every 1 unit increase in the EDC variable will cause BOPO to increase by 2185842.391 units.
d. Internet Banking has a regression coefficient in a negative direction, namely 9911397.122. This means that every 1 unit increase in the Internet Banking variable will cause BOPO to decrease by 9911397.122 units.
e. Interest rates have a regression coefficient in a negative direction, namely -1.032. This means that every 1 unit increase in the interest rate variable will cause BOPO to decrease by 1.032 units.

Statistical F Test

This test was carried out with the aim of testing the influence of the independent variables and control variables on the dependent variable together. The test is carried out by looking at F count and F table, namely if F count > F table then it can be concluded that the independent variable has

an effect on the dependent variable and if the probability (significance) is greater than α (0.05) then the independent variables together have no effect on the BOPO variable but if the probability (significance) is smaller than α (0.05) then the independent variables together have an effect on the BOPO variable.

It can be seen that the calculated F value in this research equation without control variables is 23.572 and with a significance level of 0.000, this shows that the significance level is smaller than α (0.05) so it can be concluded that the independent variable (without control variables) in the research These together influence the dependent variable, namely BOPO.

It can be seen that the calculated F value in this research equation with the control variable is 20.353 and with a significance level of 0.000, which shows that the significance level is smaller than α (0.05) and it can be concluded that the independent variable with the interest rate control variable in this study together they influence the dependent variable, namely BOPO.

Statistical t test

This statistical t test aims to test the influence of independent variables including control variables on the dependent variable Partial. To make decisions by looking at the comparison of t calculated for each coefficient with the t table at the same level of confidence, namely 5 percent. If t count > t table then the independent variable has an effect on the dependent variable. Apart from looking at the comparison of t count and t table, decision making is also made based on probability or level of significance. If the probability or significance is greater than α (0.05) then the independent variable individually or partially has no effect on the dependent variable or the independent variable BOPO. However, if the probability or significance is smaller than α (0.05), then the dependent variable or independent variable individually or partially has an effect on the dependent variable or independent variable BOPO. The results of the multiple regression analysis above without using control variables, as shown in the table, show that the ATM variable has a calculated t of -0.807 with a significance level of 0.423, which is not significant at α (0.05), so it can be partially concluded that the ATM variable has a negative but not significant effect on BOPO. .The calculated t value of the EDC variable is 7.055 with a significance level of 0.000 which is significant at α (0.05) so it can be partially concluded that the EDC variable has a positive and significant effect on BOPO. Furthermore, the calculated t value of the Internet Banking variable is -0.564 with a significance level of 0.575 which is not significant at α (0.05) so it can be partially concluded that the Internet Banking variable has a negative but not significant effect on BOPO. Meanwhile, the results of the multiple regression analysis above using control variables as the results in table 4.8 show that the ATM variable has a t count of -1.120 and with a significance level of 0.267, it is not significant at α (0.05) so it can be partially concluded that the ATM variable has a negative but not significant effect on BOPO. The calculated t value of the EDC variable is 4.495 and with a significance level of 0.000 it is significant at α (0.05) so it can be It can be partially concluded that the EDC variable has a positive and significant effect on BOPO. Furthermore, the calculated t value of the Internet Banking variable is -1.972 with a significance level of 0.054 which is significant at α (0.05) so it can be partially concluded that the Internet Banking variable has a negative and significant effect on BOPO. Meanwhile The calculated t value of the interest rate control variable is

-2.299 with a significance level of 0.025 which is significant at α (0.05) so it can be partially concluded that the interest rate control variable has a negative and significant effect on BOPO.

Coefficient of Determination Test

To see the strength of the influence of the independent variable on the variation of the dependent variable, it can be done by looking at the value of the coefficient of determination (R^2), which is between 0 and 1. A low R^2 value indicates that the ability of the independent variables to explain the variation in the dependent variable is limited, the higher the R^2 value. means that the independent variables are able to explain variations in the dependent variable (Ghozali, 2021).

It can be seen that the value of the coefficient of determination without control variables is between 0 and 1. This can be seen in the adjusted R square value of 0.534. This means that 53.4 percent of the dependent variable BOPO is explained by three variables, namely ATM, EDC and Internet Banking. Meanwhile, the remaining 46.6 percent is explained by other variables or causes outside the research model. It can be seen that the coefficient of determination value with the control variable is between 0 and 1. This can be seen in the adjusted R square value of 0.567. This means that 56.7 percent of the dependent variable BOPO is explained by three variables, namely ATM, EDC and Internet Banking and one control variable, namely interest rate. Meanwhile, the remaining 43.3 percent is explained by other variables or causes outside the research model.

T Test Difference Test

This T test is carried out to test the difference in averages in two related samples (Ghozali, 2021). This test was carried out to determine the comparison of efficiency levels (BOPO) and independent variables before and after the Covid 19 pandemic, namely by using data for the period before the pandemic in 2018-2019 and data after the Covid 19 pandemic, namely 2020-2021.

From the test results, it can be seen that the average BOPO before the Covid 19 pandemic was 80.63 and the average BOPO after the Covid 19 pandemic was 84.96. Meanwhile, the average ATM before the Covid 19 pandemic was 0.9333 and after the Covid 19 pandemic it was 0.9533. The average EDC before the Covid 19 pandemic was 0.000 and after the Covid 19 pandemic it was 0.000. Furthermore, the average Internet Banking before the Covid 19 pandemic was 0.000000175 and after the Covid 19 pandemic it was 0.000000200. Control Variable The average interest rate before the Covid 19 pandemic was 5.3646 and after the Covid 19 pandemic it was 3.8854.

It can be seen that there are differences in the averages of the variables used in this research but to see whether these differences are significant or not can be seen in table 4.16, namely by looking at the significance level t at the α confidence level used, namely 5%. Testing is carried out by looking at the level of significance or probability, if the probability or significance is greater α (0.05), then there is no difference in the average between the independent variable and the dependent variable in the period before and after the Covid 19 pandemic. However, if the probability or significance is smaller α (0.05) then there is an average difference between the independent variable and the dependent variable before and after the Covid 19 pandemic. The table shows that the t value of the dependent variable BOPO is -7.312 with a significance level of 0.000 and significant at α (0.05) so it can be concluded that there is a difference in the average BOPO in the period before and after the

Covid 19 pandemic. Furthermore, the t value for the ATM variable is -2.205 with a significance level of 0.038 and is significant at α (0.05) so it can be concluded that there is a difference in the average ATM in the period before and after the Covid 19 pandemic. For the EDC variable the t value is -12.972 with a significance level of 0.000 and significant at α (0.05) so it can be concluded that there is a difference in the average of the EDC variable in the period before and after the Covid pandemic 19. Meanwhile, the t value for the Internet Banking variable was recorded at -1.366 with a significance level of 0.185 where the significance level is not significant at α (0.05) so it can be concluded that there is no difference in the average of the internet banking variable in the period before and after the Covid pandemic 19. Furthermore, for the interest rate variable as a control variable, the t value was recorded at 6.987 with a significance level of 0.000 and significant at α (0.05) so it can be concluded that there is a difference in the average interest rate variable as a control variable in the period before and after the Covid pandemic 19.

DISCUSSION

The research results show that the level of efficiency can be explained by the ATM, EDC and Internet Banking variables. Partially, the ATM variable has a negative but not significant effect, while the EDC variable has a positive and significant effect and the Internet Banking variable and the interest rate control variable has a negative and significant effect.

The Effect of ATM on Efficiency

The results of this research show that ATMs have a negative but not significant effect on efficiency as measured by BOPO in the conventional banking sector in the 2017-2021 period. These results do not support the first hypothesis, namely that ATMs have a positive and significant effect on bank efficiency. in the period before and after the Covid 19 pandemic. Apart from that, the results of this research are also not in line with research by Frank & Binaebi (2019), Sakanko & David (2019), Torki et al (2019) and Akhisar et al. (2015) shows the results that ATM has a positive and significant influence on the efficiency and financial performance of banks. Meanwhile, the results of the difference test (t test) which looks at the comparison in the period before and after the Covid 19 pandemic shows that there is a difference in the average of the ATM variable in the period before the Covid-19 pandemic and after the Covid-19 pandemic. The results of this research mean that an increase in transaction volume and nominal transactions using ATMs is not necessarily accompanied by more efficient BOPO. This is also influenced by the increasing volume of transactions and nominal transactions, which will affect the costs incurred by the Bank, including cash handling costs to fulfill the need for money on the ATM network owned by the Bank, thus having an impact on operational costs incurred by the Bank, apart from operational income. from ATM services, namely the potential for fee-based income obtained from increasing transaction volume using different ATM networks from ATM card issuing banks. So even though there is a difference in average between the periods before and after the Covid 19 pandemic, transactions using ATMs have a negative influence, but it is not significant or has no effect on banking efficiency as measured using BOPO in the research period.

Effect of EDC on Efficiency

The results of this research show that EDC has a positive and significant effect on efficiency as measured by BOPO in the conventional banking sector in the 2017-2021 period. These results

support the second hypothesis, namely that EDC has a positive and significant effect on bank efficiency in the period before and after the Covid 19 pandemic. These results are in line with research conducted by Mohammed et al. (2022) and Torki et al. (2019) which shows the results that the use of EDC or POS has a positive and significant influence on bank efficiency and financial performance. Meanwhile, the results of the different test (t test) which looks at comparisons in the period before and after the Covid-19 pandemic show that there is a difference in the average EDC variable in the period before the Covid-19 pandemic and after the Covid-19 pandemic. These results mean that the higher the transactions using EDC then has an effect on increasing the BOPO ratio. Transactions using EDC require investment from the Bank in the form of providing EDC equipment at each merchant to be used for every transaction using a card and according to the provisions issued by Bank Indonesia, merchants are subject to a merchant discount rate (MDR) fee at a rate according to the merchant's category or classification. The MDR fee is used by the Bank in order to improve services and system investment costs used by the Bank. So EDC has a positive and significant influence on banking efficiency as measured using BOPO in the research period and there is a difference in average transactions using EDC in the period before and after the Covid 19 pandemic.

The Effect of Internet Banking on Efficiency

The results of this research show that Internet Banking has a negative and significant effect on efficiency as measured by BOPO in the conventional banking sector in the 2017-2021 period. These results do not support the third hypothesis, namely that Internet Banking has a positive and significant influence on bank efficiency in the period before and after the Covid 19 pandemic. These results are not in line with research conducted by Sakanko & David (2019), Moudud-Ul-Huq & Hossain (2019). 2020), Torki et al (2019) and Mohammed et al. (2022) which shows the results that the use of Internet Banking has a positive and significant influence on the efficiency and financial performance of banks. However, these results are in line with research conducted by Takon et al., n.d. (2019) and Akhisar, et al (2015) which shows the results that the use of Internet Banking has a negative and significant influence on bank efficiency and performance. Meanwhile, the test results are different (t test) which looks at the comparison in the period before and after the Covid 19 pandemic shows that there is no difference in the average of Internet Banking variables in the period before and after the Covid 19 pandemic. The results of this research show that the higher the transaction volume and transaction nominal, the more influence against the decline in BOPO. Transactions using Internet Banking require investment in the information technology used, including systems, applications and human resources issued by the Bank. In addition, transactions using Internet Banking have the potential for banks to earn income from transaction fees for services provided when making transactions using Internet Banking which has the potential to increase operational income so as to reduce the BOPO ratio thereby increasing efficiency. So that Internet Banking has a negative and significant influence on banking efficiency as measured using BOPO in the research period, apart from that, from the results of different tests in the period before and after the Covid 19 pandemic, there is no difference in the average transactions using Internet Banking in the period before and after the pandemic. covid 19.

The Effect of Interest Rates on Efficiency

The results of this research show that the interest rate control variable has a negative and significant effect on efficiency as measured by BOPO in the conventional banking sector in the 2017-2021 period. Apart from that, the results of the difference test (t test) also show that there is a difference in the average interest rate variable in the period before the pandemic and after the Covid 19 pandemic. This shows that interest rate movements will affect the level of banking efficiency which is reflected in BOPO. Changes in policy interest rates are transmitted to banking operational activities and affect the Bank's operational income which is affected by changes in interest rates, namely interest income and interest costs incurred in Bank's operational activities. So changes in interest rates will have an effect on reducing BOPO or will have an effect on increasing banking efficiency.

CONCLUSION

This research aims to examine the effect of ATM, EDC and Internet Banking on banking efficiency as measured by BOPO and by using interest rate control variables in the conventional banking sector for the period 2017 - 2021 and by comparing the period before and after the Covid 19 pandemic. Furthermore, based on the results of the analysis and discussion that has been carried out in the previous chapter, then in this research the following research conclusions can be obtained, ATMs have no effect on efficiency as measured by BOPO in the conventional banking sector for the 2017-2021 period, even though there are differences in the average ATM variables in the period before the Covid-19 pandemic (2018-2019) and after the Covid-19 pandemic (2020-2021).EDC has a positive and significant effect on efficiency as measured by BOPO in the conventional banking sector for the 2017-2021 period, even though there is a difference in the average EDC variable in the period before the Covid-19 pandemic (2018-2019) and after the Covid-19 pandemic (2020-2021).).Internet Banking has a negative and significant effect on efficiency as measured by BOPO in the conventional banking sector for the 2017-2021 period even though there is no difference in the average Internet Banking variable in the period before the Covid-19 pandemic (2018-2019) and after the Covid-19 pandemic (2020). -2021).Interest Rate which is the control variable in this research has a negative and significant effect on efficiency as measured by BOPO in the conventional banking sector for the 2017-2021 period and there is a difference in the average of the Interest Rate variable in the period before the Covid 19 pandemic (2018-2019) and after the covid 19 pandemic (2020-2021).From the results of different tests on the variables used, namely BOPO, ATM, EDC and interest rates, the results showed that there were differences in the averages of these variables in the period before the Covid-19 pandemic (2018-2019) and after the Covid-19 pandemic (2020- 2021). Meanwhile, for the Internet Banking variable, from the results of different tests, there is no difference in the average of this variable in the period before the Covid-19 pandemic (2018-2019) and after the Covid-19 pandemic (2020-2021).

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