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The Influence of E-banking Technology Adoption on Sharia Banking Performance Moderated by Islamic Corporate Governance

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ABSTRACT

The purpose of this study was to determine the role of Islamic Corporate Governance in this case the characteristics of top management and the characteristics of the Sharia Supervisory Board (DPS) in moderating the effect of e-banking technology adoption on Islamic banking performance. In this study, Islamic banking performance is proxied through financial performance as measured by Return on Assets (ROA) and Operational Performance as measured by Operating Expenses to Operating Income (BOPO). Therefore, the research objects in this study are top management characteristics, Sharia Supervisory Board characteristics, e-banking technology adoption, financial performance and operational performance of Islamic banking. Meanwhile, the research subjects are Islamic commercial banks in Indonesia during the period 2016 to 2020. This study uses a quantitative descriptive approach, so the data analysis technique used is descriptive analysis and moderation regression analysis with the help of SPSS Version 26 software. The results of this study indicate that the adoption of e-banking technology has a significant effect on the financial performance of Islamic banking as measured using ROA and has a significant effect on operational performance as measured using BOPO. In addition, ICG successfully moderates the effect of e-banking technology adoption on Islamic banking performance.

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1. INTRODUCTION

The growth of Islamic economics in Indonesia is still considered low compared to other Muslim-majority countries such as Malaysia and countries in Middle East countries such as United Arab Emirates. This is proven by data from State of Global Islamic Report 2020-2021 which shows that sharia financial industry in Indonesia is in the sixth place, far below Malaysia and several countries in the Middle East region.

The development of Islamic economy in Indonesia is generally marked by the existence and growth of sharia banking industry as the main indicator (Badruzaman, 2020). Based on the surveys, in-depth interview (IDI), and Focus Group Discussion (FGD) conducted by OKJ, there are several strategic issues that hinder the growth and performance of sharia bank in Indonesia. Among these strategic issues are the absence of significant business model differentiation, business development which only focuses on business goals, human resources quality and utilization of Information Technology which is less than optimal, as well as inclusion and literacy index which is still low (OJK,2020). Therefore, in the development of sharia banking roadmap in 2020-2025, OJK issued various policies, including enforcing the preparation of Information Technology (IT) infrastructure by supporting the implementation of digitalization of sharia banking through the implementation of POJK banking synergy.

Utilization of information technology is one of the means that sharia banking can opt to meet community needs and increase competitiveness. The use of technology is closely related to bank operational activities, where banks are required to remain efficient in carrying out their operational activities in order to improve bank performance both through financial performance and operational performance. According to Sutarti et al. (2019), adopting E-banking technology can help banks to reduce operational costs, in addition to reducing the need for extensive territorial networks.

In this research, bank performance will be proxied by financial performance (ROA) as done by Hernando & Nieto (2007), as well as operational performance (BOPO) to describe bank efficiency performance (Sutarti et al. 2019; Safira & Susilowati, 2021).

Besides, the rapid progress of information technology is creating new services in the form of technology applications (Lai, 2017). In Indonesia, the rules regarding information technology and the use of banking technology applications have been stipulated by the Financial Services Authority (OJK) through Financial Services Authority Regulation Number 38/POJK.03/2016 and Financial Services Authority Circular Letter Number 21/SEOJK.03/2017 where in essence the regulator instructed all banks, both sharia and conventional, to implement risk management in the use of information technology.

In general, number of research have been done to study the direct influence of e-banking adoption on bank performance or research related to the direct influence of internal control on bank performance. However, research that uses Islamic Corporate Governance (ICG) as a moderating variable that strengthens or weakens other variables, in this case the decision to adopt e-banking on bank performance, especially Islamic banks, is still limited. For this reason, this research is important to carry out considering the enormous potential of sharia banking in Indonesia.

2. METHODS

This research uses a quantitative descriptive approach, using analytical techniques in the form of descriptive analysis and moderated regression analysis with the help of SPSS Version 26 software. The population in this research is Sharia Commercial Banks in Indonesia

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for the selected period, namely 2016 to 2020. Total population in this research were 14 Sharia Commercial banks in Indonesia.

Research Variables

The dependent variable in this research is sharia banking performance which is proxied through financial performance and operational performance calculated on a ratio scale from the Return on Assets (ROA) and Operating Expenses and Operating Income (BOPO) ratio values. As a supporting ratio to measure management's ability to generate profits originating from the utilization of total assets, ROA is calculated in the following way:

$$ROA = (Profit\ Before\ Tax)/(Total\ Assets)$$

Source: Reinaldo et al. (2017)

Meanwhile, in banking regulations in Indonesia, the ratio approach to measure efficiency is using the BOPO ratio, namely the comparison between operational expenses and operational income as regulated in POJK Number 4/POJK.03/2016 concerning Assessment of the Soundness Level of Commercial Banks and attachment to SE Bank Indonesia Number 3/30/DPNP dated 14 December 2001. The higher the BOPO value, the more inefficient the bank is (Sutarti, et al. 2019). The formula for calculating BOPO is as follows:

$$BOPO = (\text{Operational Expenditure})/(\text{Operating Income})x\ 100\%$$

Source: Handoko (2010:8)

The independent variable in this research is e-banking technology adoption. These variables can be seen from the annual report (Annual Report) published by each company on its official website.

There are eight e-banking services, namely ATM, EDC, credit/debit card, SMS banking, internet banking, mobile banking, telephone banking, and video banking (PBI No. 9/15/PBI/2007; OJK, 2015). Based on the data from the annual report and referring to the PBI and OJK regulations, to measure the independent variables in this research, a checklist was created for the availability of e-banking services offered by banks. If the bank adopts all e-banking services (1. ATM; 2. EDC; 3. SMS banking; 4. internet banking; 5. mobile banking; 6. phone banking; 7. credit/debit card and 8. video banking), then the adoption score gets the maximum value, namely eight. A value of one is the lowest level of e-banking adoption and eight is the strongest level of adoption (Sutarti, 2019; Tyas and Purwanti, 2020; Safira and Susilowati, 2021).

A moderating variable is a variable that influences (strengthens or weakens) the relationship between the independent variable and the dependent variable (Jaya, 2020: 63). Apart from that, according to Sugiyono (2021:69), the moderation variable is also called the second independent variable.

The moderating variable in this research is the Islamic Corporate Governance variable which is measured using several indicators which are grouped into two sub variables, top management characteristics and DPS characteristics. Top management characteristics are measured by calculating several indicators such as the number of top management members, gender diversity, and education level (Farag et al., 2018; Mollah and Zaman, 2015). Each of these indicators is calculated based on certain criteria. Then, after each indicator is calculated,

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a dummy variable is created. If the company has a number of top management members that is more than the average number of research samples, or at least has a number of members equal to the average number of top management members used in the research sample, then the company will be given a value of 1, if it is less than the average number then it will be given value 0. To measure the gender diversity indicator, a dummy variable is also created, namely if the company has gender diversity it is given a value of 1, if it does not have gender diversity it is given a value of 0. Meanwhile, the determination of the dummy variable to measure the education level indicator of the board of directors and board of commissioners is determined by giving a value of 1 for companies that have members of the board of directors or board of commissioners who have studied at Strata 3. If there are none, then the company gets a value of 0.

To measure the diversity of the Sharia Supervisory Board (DPS) in this study, it was measured using two/three indicators, namely the number of DPS members, DPS education level and DPS educational background (Nomran et al., 2018; Nomran and Haron, 2019). Just like the top management characteristics sub-variable, each indicator is calculated based on certain criteria. Then, after each indicator is calculated, a dummy variable is created. For the number of DPS member's indicator, it is measured by giving a value of 1 to companies that have more than 2 DPS members. Meanwhile, companies that only have 2 people or even just 1 person eating will be given a value of 0. Meanwhile, determining the dummy variable to measure the education level indicator of the DPS is determined by giving a value of 1 to companies whose DPS members are studying at Strata 3 (S3). If there are no DPS members who have a Strata 3 (S3) education, then the company gets a score of 0. For the educational background indicator, if there are DPS members who have an educational background in sharia finance or accounting then the company gets a score of 1, and if there are no members If a DPS has a sharia educational background, the company gets a score of 0. Next, based on the dummy variables on the sub-variables of top management characteristics and DPS characteristics, a score is created with a minimum value of 0 and a maximum value of 6.

The data collection technique in this research is document analysis. The data in this research is secondary data, namely data obtained from data collection techniques that support primary data sourced from books, journals, internal reports, literature and other documents related to the research problem. In this research, the data collected is expected to include a general description of e-banking adoption, characteristics of top management, characteristics of the Sharia Supervisory Board (DPS) and sharia banking performance.

Data Analysis

To measure and analyze the relationship between variables in this research, the classical assumption test and moderated regression analysis were used with the help of the SPSS version 26 program.

3. RESULTS AND DISCUSSION

Descriptive Statistics

Table 1 Descriptive Statistics

	N	Min	Max	Mean	Std. Dev
ADOPSI E-BANKING (X1)	70	1.00	7.00	4.7714	1.52440
ICG (X2)	70	2.00	6.00	3.9000	1.09213
ROA (Y)	70	-10.77	13.58	1.4667	3.35472
BOPO (Y)	70	58.07	217.40	91.8074	19.45400

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Valid N (listwise)	70				

Based on the table above, it is known that the minimum value for the e-banking technology adoption variable is 1, meaning that among the sharia banks that were used as objects in this research and during the research period there were banks that only carried out 1 e-banking adoption. Although based on OJK regulations it is stipulated that there are eight e-banking services, namely ATM, EDC, credit/debit card, SMS banking, internet banking, mobile banking, telephone banking and video banking, in fact there is not a single Sharia Commercial Bank in Indonesia (BUS) which uses all these facilities. This is proven by the results of descriptive statistical tests which show the maximum value is only 7, meaning that during the research period there were Islamic banks that adopted or used 7 e-banking facilities. Based on research, it is known that not a single Sharia Commercial Bank in Indonesia until 2020 uses or adopts video banking technology. Meanwhile, the average value (mean) for the e-banking technology adoption variable is 4.7714, meaning that of all the BUS that were used as research objects, they on average adopted only 4 to 5 types of e-banking service e-banking technology.

Of all the sharia banks that were used as research objects, there were sharia banks that only met the criteria for the ICG variable with 2 sub-indicators, but there were also sharia banks that were able to fulfill all the criteria for the ICG variables that had been determined so that they got a maximum score of six (6). Meanwhile, the average value is 3.9000, meaning that of all the Islamic banks that were used as research objects, on average they were only able to fulfill the predetermined criteria, only ranging from three (3) or four (4) sub-indicators. Based on this research, it is known that there are several sharia banks that have fewer top management members than the average number of other sharia banks. Then, it was also discovered that in the early years of the research there were several sharia banks that did not have gender diversity and the education level of top management members was below doctoral degree. Apart from that, regarding the diversity of the Sharia Supervisory Board, there are several banks that only have two (2) members, with a maximum education level of master's degree, however all DPS members owned by sharia banks in this study have an educational background in sharia or Islamic economics.

Based on the results of statistical tests, it is known that the minimum ROA value is -10.77, this value indicates that the company experienced significant losses in generating profits from the use of its assets. Meanwhile, the maximum value is 13.58, meaning it shows that the company generates good profits from the use of its assets. This figure shows the percentage of profit generated by the company in relation to the total value of assets owned. A high ROA shows that the company is able to optimize the use of its assets to generate significant profits. Meanwhile, the average value of ROA in Islamic banks which is the object of research is 1.4667, meaning this shows that the company generates relatively low profits from the use of its assets. This figure shows the percentage of profit generated by the company in relation to the total value of assets owned.

As for the BOPO ratio, based on the results of descriptive statistical tests, the minimum value that occurs is 58.07, this shows that the company's operational costs reach 58.07% of operational income. Meanwhile, the maximum value is 217.40, this indicates that the company's operational costs are more than double its operating income. As a general rule, a high BOPO indicates that the company's operational costs exceed the operational income generated. The average value of the BOPO ratio in this research is 91.8074, meaning that in

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general the Islamic banks used as objects in this research have an average of company operational costs reaching 91.81% of their operational income.

Normality Test

Table 2 Normality Test Results

N		70
Normal Parametersa,b	Mean	.0000000
	Std. Deviation	1.55805737
Most Extreme Differences	Absolute	.179
	Positive	.179
	Negative	-.151
Test Statistic		.179
Asymp. Sig. (2-tailed)		.019[c]

Source: Processed data, 2023

Based on the data from the table above, it is known that the value of Asymp. Sig (2-tailed) obtained from the One-Sample Kolmogorov-Smirnov test is above the confidence level α=0.05, namely 0.019. This means that the residual data in this study is normally distributed.

Multicollinearity Test

Table 3 Multicollinearity Test Results

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Adopsi Tek. E-banking	.206	4.865
	ICG	.319	3.136
	Adopsi*ICG	.123	8.156
1	(Constant)		
	Adopsi Tek. E-banking	.206	4.865
	ICG	.319	3.136
	Adopsi*ICG	.123	8.156

Model 1 Dependent Variable: ROA
Model 1 Dependent Variable: BOPO
Sumber: Data diolah, 2023

Based on the data from the table above, it is known that each tolerance value for the independent variable is above 0.10 and the VIF value is below 10.00. Based on these data, it can be concluded that there are no symptoms of multicollinearity between the independent variables in the regression model.

Heteroscedasticity Test

Table 4 Heteroscedasticity Test Results-Glejser Test

Model		Sig
1	(Constant)	.535
	Adopsi Tek. E-banking	.209
	ICG	.522

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	Adopsi*ICG	.223
1	(Constant)	.991
	Adopsi Tek. E-banking	.099
	ICG	.071
	Adopsi*ICG	.071

Model 1 Dependent Variable: ROA
Model 1 Dependent Variable: BOPO
Sumber: Data diolah, 2023

Based on the data from the table above, it can be seen that the regression coefficients for all independent variables, both for the dependent variable in the form of ROA and BOPO, have significance values above 0.05. This means that based on the results of the heteroscedasticity test using the Glejser test, there is no similarity in the variance of the residual values for all observations in the regression model.

Autocorrelation Test

Table 5 Durbin-Watson ROA Test Results

Model	R	R Square	Adjusted R Square	Std. Error	DW
1	.752[a]	.565	.546	1.59307	2.170

a. Predictors: (Constant), E-BANKING*ICG, ICG, ADOPSI E-BANKING
b. Dependent Variable: ROA

Table 6 Durbin-Watson BOPO Test Results

Model	R	R Square	Adjusted R Square	Std. Error	DW
1	.680a	.462	.438	12.07526	2.278

a. Predictors: (Constant), XADXICG, ICG, ADOPSI E-BANKING
b. Dependent Variable: BOPO

Based on the autocorrelation test results listed in table 6 above, it is known that the Durbin-Watson value for the dependent variable ROA is 2.170. Referring to the basis of decision making where the regression model is said to have no autocorrelation if du<dw<(4-du) then 1.7028<2.170<2.297, it can be concluded based on the test results that no autocorrelation occurs. Likewise, for the autocorrelation test with the dependent variable BOPO, it is known based on the test results that the Durbin-Watson (dw) value is 2.278 so that the result is 1.7028<2.278<2.297, which means that there is no autocorrelation.

Moderated Regression Test

The moderation regression test is a statistical method used to evaluate whether a variable has a moderating effect on the relationship between the independent variable and the dependent variable in regression analysis. Through the moderation regression test, it can be seen whether the relationship between the independent variable and the dependent variable changes depending on the value of the moderating variable. This is in line with the aim of this research, apart from finding out the influence of the adoption of e-banking technology as an independent variable on sharia banking performance which is proxied through financial performance and operational performance. The main objective of this research is to find out how Islamic Corporate Governance (ICG) moderates the influence of the independent variable on the dependent variable mentioned previously.

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The initial step that is generally taken in a moderation regression test is to enter the independent variable, the moderating variable, and the interaction between the two. This regression model is usually expressed as a mathematical equation as below:

$Y = \alpha + \beta 1X1 + \in$

$Y = \alpha + \beta 1X1 \ + \beta 2X2 \ + \ \beta 3X1X2 + \in$

Source: Sujarweni (2014:214)

In this study there is one independent variable and one moderating variable so a simple linear regression test is carried out first. Based on the results of a simple linear regression test using the SPSS 26 program analysis tool, the following regression results were obtained:

Table 7 Simple Regression Test (ROA)

Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	-2.316	.849
	Adopsi e-banking	0.001	0.000

Based on the data in the table above, a regression equation can be prepared for the dependent variable ROA as follows:

$$ROA = -2{,}316 + 0{,}001\ Adopsi\ Ebanking + \in$$

The interpretation of the regression equation is that when Ebanking Adoption is equal to zero, then ROA has a value of -2.316. Furthermore, for every one-unit increase in the E-banking Adoption variable, ROA will increase by 0.001.

Table 7 Simple Regression Test (BOPO)

Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	122.58	6.935
	Adopsi e-banking	0.001	0.002

Apart from that, based on the data in table 4.7 above, a regression equation can be prepared for the dependent variable BOPO as follows:

$$BOPO = 122{,}581 - 0{,}010\ Adopsi\ EbankinG + \in$$

From this equation it is known that the regression coefficient value of e-banking adoption is negative. So it can be concluded that when e-banking adoption is equal to zero, BOPO has a value of 122,581. Furthermore, for every one-unit increase in the e-banking adoption variable, BOPO will decrease by 0.010.

Next, to obtain the moderation regression equation, it can be prepared based on the results of the moderation regression test listed in the table below:

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Table 8 ROA Moderation Regression Results

Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	5.268	1.293
	X1	-.001	.001
	X2	-.004	0.001
	X1*X2	.004	0.001

Based on Table 8 above, the moderation regression equation can be prepared as follows:

$$ROA = 5{,}268 - 0{,}001 \text{ Adopsi Ebanking} - 0{,}004\text{ICG} + 0{,}004\text{Ebanking} * \text{ICG} + \in$$

In interpreting the moderated regression equation, ROA is influenced by the variables E-banking Technology Adoption and ICG, as well as the interaction between the two. Changes in the value of E-banking Technology Adoption and ICG will contribute negatively to changes in ROA. In addition, the interaction between E-banking Technology Adoption and ICG will also influence this relationship, in a positive direction.

Table 9 BOPO Moderation Regression Results

Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	79.726	8.897
	X1	.009	.004
	X2	.024	.004
	X1*X2	-.030	.006

Apart from that, based on Table 9 above, a moderated regression equation can be prepared for the dependent variable BOPO as follows:

$$BOPO = 79{,}726 + 0{,}009 \text{ Adopsi Ebanking} + 0{,}024\text{ICG} - 0{,}030\text{Ebanking} * \text{ICG} + \in$$

In interpreting the moderation regression equation, we can say that BOPO is influenced by the variables E-banking Technology Adoption and ICG, as well as the interaction between the two. Changes in the value of E-banking Technology Adoption and ICG will contribute positively to changes in BOPO. Apart from that, the interaction between E-banking Technology Adoption and ICG will also influence this relationship in a negative direction.

Partial t test

Tabel 10. t Test Results

Coefficients

	t	Sig
(Constant)	4.076	0.000
Adopsi	-2.310	0.024
ICG	-6.289	0.000
Adopsi*ICG	4.779	0.000

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Based on the results of the t statistical test contained in Table 4.9, the regression model in this research can be interpreted as follows:

a. Adoption of E-banking Technology on ROA

From the results of the t statistical test, it is known that the calculated t value for the E-banking Technology Adoption variable on ROA is 2.310, while the t table value is 1.668. This means that based on these figures it is known that the calculated t value> t table. Apart from that, the significance value of the partial t statistical test results is 0.024, meaning it is smaller than 0.05 (0.024<0.05). These results indicate that E-banking Technology Adoption has a significant effect on financial performance as measured by ROA.

b. ICG's role in moderating E-banking Technology Adoption on ROA

From the results of the t statistical test, it is known that the calculated t value for the interaction variable E-banking Technology Adoption and ICG on ROA is 4.779, while the t table value is 1.668. This means that based on these figures it is known that the calculated t value> t table. Apart from that, the significance value of the partial t statistical test results is 0.000, meaning it is smaller than 0.05 (0.000<0.05). These results indicate that the interaction between E-banking Technology Adoption and ICG has a significant effect on financial performance as measured by ROA.

Table 11. T-Test Results

Coefficients

	t	Sig
(Constant)	8.961	0.000
Adopsi	2.111	0.039
ICG	5.461	0.000
Adopsi*ICG	-4.810	0.000

c. Adoption of E-banking Technology for BOPO

From the results of the t statistical test, it is known that the calculated t value for the E-banking Technology Adoption variable on BOPO is 2.111, while the t table value is 1.668. This means that based on these figures it is known that the calculated t value> t table. Apart from that, the significance value of the partial t statistical test results is 0.039, meaning it is smaller than 0.05 (0.039<0.05). These results indicate that E-banking Technology Adoption has a significant effect on operational performance as measured by BOPO.

d. The role of ICG in moderating E-banking Technology Adoption towards BOPO

From the results of the t statistical test, it is known that the calculated t value for the interaction variable E-banking Technology Adoption and ICG on BOPO is 4.810, while the t table value is 1.668. This means that based on these figures it is known that the calculated t value> t table. Apart from that, the significance value of the partial t statistical test results is 0.000, meaning it is smaller than 0.05 (0.000<0.05). These results indicate that the interaction between E-banking Technology Adoption and ICG has a significant effect on financial performance as measured by BOPO.

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Simultaneous F Test

Table 12. Simultaneous ROA Test Results

Regression	28,625	0.000
Residual		
Total		

Based on Table 12, it can be seen that the calculated F value for the dependent variable financial performance as measured by ROA is 28.625 with an F table value of 2.742. This means that from these figures it is known that F calculated > F table so H1 is accepted. This shows that the e-banking technology adoption variable, the ICG moderating variable, and the interaction between the two together have a significant relationship with ROA in the regression model used. These results support the moderating influence of ICG on the relationship between e-banking technology adoption and financial performance as measured by ROA.

Tabel 13. Hasil Uji Simultan BOPO

Regression	27,640	0.000
Residual		
Total		

Furthermore, based on Table 13 it can be seen that the calculated F value for the dependent variable operational performance as measured by BOPO is 27.604 with an F table value of 2.742. This means that from these figures, it is known that F calculated > F table, so H1 is accepted. This shows that the e-banking technology adoption variable, the ICG moderating variable, and the interaction between the two together have a significant relationship with BOPO in the regression model used. These results support the moderating influence of ICG on the relationship between e-banking technology adoption and financial performance as measured by BOPO.

Coefficient of Determination

The coefficient of determination (R-squared) in moderation regression analysis measures how well the independent variables in the regression model (including moderation and interaction variables) explain the variations that occur in the dependent variable.

The coefficient of determination ranges from 0 to 1. It can be interpreted as the percentage of variation in the dependent variable that can be explained by the independent variables in the regression model. A higher R-squared value indicates that the regression model is able to explain greater variation in the dependent variable. The results of the coefficient of determination in the research can be seen in the table below:

Table 14. Coefficient of Determination Test Results - ROA

Model	R	R Square	Adj R Sq
1	0.752	0.565	0.546

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Based on table 14, it is known that the correlation coefficient (R) value for the dependent variable financial performance as measured by ROA is 0.752 and the coefficient of determination (R2) value is 0.565. The interpretation of these values is as follows:

- Correlation Coefficient (R): The R value indicates the strength and direction of the linear relationship between the independent variable and the dependent variable in the regression model. In this research, it is known that the R value is 0.752, indicating that there is a strong positive relationship between the e-banking technology adoption variable, the ICG moderating variable, and the dependent variable ROA. The closer the R value is to 1, the stronger the positive relationship between these variables.
- Coefficient of Determination (R-squared): The R-squared value shows how much of the percentage of variation in the dependent variable (ROA) can be explained by the independent variable (e-banking technology adoption), the moderating variable (ICG), and the interaction between the two in the model regression. In this study, the R-squared value of 0.556 indicates that around 55.6% of the variation in ROA can be explained by the e-banking technology adoption variable, the ICG moderating variable, and the interaction between the two.

Table 15. Coefficient of Determination Test Results - BOPO

Model	R	R Square	Adj R Sq
1	0.746	0.556	0.536

Apart from that, based on table 15 it is known that the correlation coefficient (R) value for the dependent variable operational performance as measured by BOPO is 0.746 and the coefficient of determination (R2) value is 0.556. The interpretation of these values is as follows:

- Correlation Coefficient (R): The R value indicates the strength and direction of the linear relationship between the independent variable and the dependent variable in the regression model. In this research, it is known that the R value is 0.746, indicating that there is a strong positive relationship between the e-banking technology adoption variable, the ICG moderating variable, and the dependent variable BOPO. The closer the R value is to 1, the stronger the positive relationship between these variables.
- Coefficient of Determination (R-squared): The R-squared value shows how much of the percentage of variation in the dependent variable (BOPO) can be explained by the independent variable (e-banking technology adoption), the moderating variable (ICG), and the interaction between the two in the model regression. In this study, the R-squared value of 0.556 indicates that around 55.6% of the variation in BOPO can be explained by the e-banking technology adoption variable, the ICG moderating variable, and the interaction between the two.

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Discussion

The Effect of Adopting E-banking Technology on Sharia Banking Financial Performance Measured Using ROA

Based on the results of calculations using SPSS Version 26 software, it is known that the t-count for the E-banking Technology Adoption variable on ROA is 4.491, with the significance value from the results of the partial t statistical test being 0.024, meaning the significance level is smaller at 5% or 0. 05. These results indicate that E-banking Technology Adoption has a significant effect on financial performance as measured by ROA.

Furthermore, based on the results of the simple linear regression equation, it is known that the regression coefficient value for the E-banking Adoption Variable before the moderating variable is 0.001. This means that for every one-unit increase in the E-banking Technology Adoption variable, ROA will increase by 0.001. The results of this research strengthen several studies that have been conducted previously by Aduda et al. 2012; Oira et al. 2016; found a positive influence of e-banking on bank financial performance. Likewise, research conducted by Delgado et al. 2007; Hernando and Nieto 2007; Oyewole et al. 2013 which proves that the adoption of technological innovations in e-banking, including internet banking, can have a negative impact on bank performance related to ROA at the beginning of adoption (1-2 years of adoption), while the positive influence of e-banking adoption occurs after two years of adoption. The results of this study show that the adoption of e-banking technology, which is part of the company's assets, can make a positive contribution to the company's financial performance as measured by ROA. This empirical evidence also proves that the adoption of e-banking technology is a strategic plan for banks in an effort to develop services to customers, which in the end can encourage an increase in company profits.

This research also shows that the adoption of e-banking technology plays its role as part of the company's assets which can be put to good use to help improve the company's financial performance through increasing profitability as measured by ROA. Moreover, the greater the number of e-banking technology adoptions, the higher the ROA value will be. This research adds new evidence for sharia banking in Indonesia, because empirically there are not many studies in Indonesia that have conducted research on the influence of e-banking technology adoption on the financial performance of sharia banking with indicators of the number and type of e-banking services that have been determined by the Financial Services Authority. (OJK).

The Effect of Adopting E-banking Technology on Sharia Banking Operational Performance Measured Using BOPO

From the results of the second test it is known that the calculated t value > t table and the significance value of the partial t statistical test results is 0.039, meaning it is smaller than 0.05 (0.039 <0.05). These results indicate that E-banking Technology Adoption has a significant effect on operational performance as measured by BOPO.

On the other hand, based on a simple linear regression equation, it is known that the regression coefficient value for e-banking technology adoption is -0.010. The negative meaning for this coefficient is that the direction of the influence of e-banking technology adoption on BOPO is negative. So it can be concluded that for every one-unit increase in the e-banking adoption variable, BOPO will decrease by 0.010. BOPO is a comparison between

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operational expenses and income. The higher the BOPO value, the more inefficient a bank is. So a decrease in BOPO is a good indication for the bank's operational performance.

The results of this research strengthen previous research (Stoica et al. 2015; Sutarti et al, 2019; Safira & Susilowati, 2021). The results of their research both prove that the adoption of e-banking technology has an effect on company efficiency. However, based on the direction of influence, this research is in line with research conducted by Stoica at al (2015) on banks in Romania. The research results of Stoica et al. (2015) identified that the use of e-banking innovation represented by internet banking services can improve bank performance in terms of efficiency. However, this research is not in line with the research results of Sutarti et al, (2019) and Safira & Susilowati (2021) which state that the adoption of e-banking technology has a positive effect on BOPO. The difference in research results is thought to be in terms of sample selection, where research by Sutarti et al (2019) conducted research on all commercial banks in Indonesia outside of sharia banks, while Safira & Susilowati (2021) conducted research on sharia commercial banks and sharia business units in Indonesia. The existence of different types of banking is thought to influence the decision on the number of adoptions carried out.

However, the results of this study prove that the more adoption of e-banking technology by Islamic commercial banks in Indonesia, the more efficient the bank's operational activities will be. Determining the number of e-banking technology adoptions carried out by banks is one of the business strategies that will have an impact on bank performance, especially in terms of operational performance. This can happen because the adoption of e-banking technology is closely related to bank operational activities. One of them is the adoption of e-banking technology which allows customers to carry out a number of banking transactions such as fund transfers, bill payments, product purchases and investments via digital platforms. This reduces dependence on physical banking services such as bank branches, thus affecting bank operations in terms of managing the number and type of transactions carried out online. This can reduce operational costs, time and human labor requirements in several bank operational activities. Overall, the adoption of e-banking technology has changed the operational landscape of banks, leading to changes in the way banks interact with customers, manage transactions, and maintain technology infrastructure. So, this can reduce bank operational costs and automatically increase operational income.

The role of ICG implementation in moderating the influence of e-banking technology adoption on sharia banking financial performance as measured using ROA

Based on the results of the calculations that have been carried out, it is known that the t-count value for the interaction variable between the adoption of e-banking technology and ICG on ROA is greater than the t table. Apart from that, the significance value of the partial t statistical test results is 0.000, meaning it is smaller than 0.05 (0.000<0.05). These results indicate that the interaction between E-banking Technology Adoption and ICG has a significant effect on financial performance as measured by ROA.

In addition, based on the moderation regression equation, it is known that ROA is influenced by the variables E-banking Technology Adoption and ICG, as well as the interaction between the two. Changes in the value of E-banking Technology Adoption and ICG will contribute negatively to changes in ROA. Apart from that, the interaction between E-banking Technology Adoption and ICG will also influence this relationship, but the direction is positive.

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This can be interpreted as meaning that the stronger the interaction between the E-banking Technology Adoption and ICG variables, the greater the ROA value.

There is still lack of literature regarding the implementation of ICG as a moderating variable between the influence of e-banking technology adoption on bank financial performance. However, this research empirically strengthens previous research which used ICG and internal control as moderating variables (Laeli & Yulianto, 2016; Sutarti et al, 2019; Safira & Susilowati, 2021). A study conducted by Laeli & Yulianto (2016) conducted to research sample of Islamic commercial banks in Indonesia found that ICG succeeded in moderating the positive influence of bank health variables on profitability as measured using ROA. Furthermore, research conducted by two other researchers (Sutarti et al, 2019; Safira & Susilowati, 2021) proved that internal control succeeded in strengthening the influence of e-banking adoption on bank performance.

Based on previous research and looking at the perspective of sharia enterprise theory, this research is consistently running because the research topic has developed. In this research, the implementation of Islamic Corporate Governance (ICG) is measured using the characteristics of top management and the characteristics of the Sharia Supervisory Board. The results of this research prove that the characteristics of top management as measured using indicators of number of top management members, gender diversity and educational level of top management members accompanied by characteristics of the Sharia Supervisory Board (DPS) as measured by indicators of number of members, level of education and educational background have succeeded in strengthening the influence adoption of e-banking technology on the financial performance of sharia banking in Indonesia.

The characteristic aspect provides a diverse view, which is broader, more open and it can be concluded that when there is a quality background characteristic it can encourage the company to create good strategies, so that the utilization of total assets in the form of e-baking technology adoption can be maximized to improve the company's financial performance. which can be measured by ROA. In the view of sharia enterprise theory, stakeholders as caliphs of Allah are given the mandate to process resources and distribute them fairly to all living creatures on earth. This research is in line with this concept where sharia banking management under the supervision of DPS both have the responsibility and are mandated to be able to manage company assets to improve the welfare of all related parties and provide easy access and transactions to the public through the provision of e-banking facilities.

The role of ICG implementation in moderating the influence of e-banking technology adoption on sharia banking financial performance as measured using BOPO

The test results show that the t-count for the interaction variable E-banking Technology Adoption and ICG on BOPO is 4.810, while the t table value is 1.668. This means that based on these figures it is known that the calculated t value> t table. Apart from that, the significance value of the partial t statistical test results is 0.000, meaning it is smaller than 0.05 (0.000<0.05). These results indicate that the interaction between E-banking Technology Adoption and ICG has a significant effect on financial performance as measured by BOPO.

On the other hand, moderation regression testing also produces an equation showing that BOPO is influenced by the variables E-banking Technology Adoption and ICG, as well as the interaction between the two. From this test it is known that the interaction between E-

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banking Technology Adoption and ICG will also influence BOPO in a negative direction. This means that the greater the interaction, the smaller the BOPO value. The results of this research are in line with research conducted by Sutarti et al (2019) and Safira & Susilowati (2021). Although the moderating variable in their research is internal control. However, Islamic Corporate Governance (ICG) is an important component in a company's internal control. In the context of internal control, ICG provides guidance and framework for companies to organize and control their operational activities in accordance with sharia principles.

The concept of Islamic Corporate Governance (ICG) is a framework that regulates the principles of corporate governance in accordance with Islamic sharia principles. ICG aims to ensure that companies carry out their operational activities by adhering to the principles of justice, transparency, accountability and ethics in the context of sharia.

The results of this study prove that Islamic Corporate Governance can play a moderating role between the influence of e-banking technology adoption on BOPO through several mechanisms. One of them is that DPS can monitor the implementation of e-banking technology adoption to ensure that related operational activities do not conflict with sharia principles and do not cause inappropriate risks.

4. CONCLUSION

Based on the results of the research that has been carried out, the following conclusions can be drawn:

1. The adoption of e-banking technology has a significant effect on the financial performance of sharia banking as measured using ROA. This can be seen from the results of the t test calculation and its significant value. Apart from that, the determination coefficient value of the e-banking technology adoption variable is positive. This means that with the adoption of e-banking technology by sharia banking, the financial performance of sharia banking as measured using ROA will increase. The greater the number of adoptions, the higher the ROA value.
2. The adoption of e-banking technology has a significant effect on sharia banking operational performance as measured using BOPO. This can be seen from the results of the t test calculation and its significant value. Apart from that, the determination coefficient value of the e-banking technology adoption variable is negative. This means that with the adoption of e-banking technology by sharia banking, the operational performance of sharia banking as measured using BOPO will increase. The greater the number of adoptions, the lower the BOPO value. The lower the BOPO value, the more efficient the operational performance.
3. ICG implementation strengthens the influence of e-banking technology adoption on sharia banking financial performance as measured using ROA. This can be seen from the results of the t test calculation, where the calculated t value is greater than the t table and the significance value is below 0.05. From the coefficient of determination value, it is known that the interaction between E-banking Technology Adoption and ICG is positive. This means that the stronger the interaction, the higher the ROA value.
4. Implementation of ICG strengthens the influence of e-banking technology adoption on sharia banking financial performance as measured using ROA. This can be seen

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from the results of the t test calculation, where the calculated t value is greater than the t table and the significance value is below 0.05. From the coefficient of determination value, it is known that the interaction between E-banking Technology Adoption and ICG is negative. This means that the stronger the interaction, the lower the BOPO value so that operational performance is more efficient.

Research Limitations and Suggestions

Based on the research findings and discussions that have been carried out, this research has the following limitations:

1. This research uses a sample of Sharia Commercial Banks (BUS) registered with the Financial Services Authority and does not include data on other sharia banks such as banks in the Sharia Business Unit (UUS) category and Sharia Rural Banks (BPRS).
2. This research has only focused on developing a measurement of the use of e-banking technology innovation adoption which is proxied by the number of e-banking technology innovation adoptions.
3. This research found limitations in the time period since it was conducted between the year during the Covid-19 pandemic and the year before Covid-19, so that the consequence was that the test results were unable to present trends regarding the influence of the use of e-banking technology adoption over time.

Based on several limitations in this research, further research needs to consider the following:

1. Future research can increase the research sample by including other sharia banks such as Sharia Business Units (UUS) and Sharia Rural Banks (BPRS) so that they can be more general in nature. If possible, future researchers can also use cross-country bank samples.
2. Further research can use other indicators to measure the dependent variable by using the e-banking technology adoption index, the benefits or use of adopting e-banking technology innovation or using primary data in the form of a questionnaire related to the use of e-banking technology innovation adoption in banks. .
3. Future research needs to consider the choice of time period to obtain more conclusive conclusions regarding trends in the use of e-banking technology adoption.

Implications

Based on the research results and discussion, the researcher put forward several implications of the results of this research as follows:

1. This research provides empirical evidence regarding the extent to which the adoption of e-banking technology can influence the financial performance of Islamic banking by increasing profitability as measured by ROA. Increased financial performance and competitiveness of Islamic banks as a result of effective adoption of e-banking technology, moderated by ICG. In an increasingly digital environment, Islamic banks that are able to utilize e-banking technology well can provide a better customer experience, will gain a competitive advantage in the market so that they can increase profits from the Islamic bank. The more and better the e-banking quality provided to customers, the greater the potential for increasing company profits.

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2. This research also proves that the adoption of e-banking technology provides operational efficiency benefits for Islamic banks. By using e-banking technology, banks can automate transaction processes and banking services, reduce operational costs, and increase speed and accuracy in transaction processing. ICG can play a role in ensuring that the adoption of e-banking technology remains compliant with sharia principles and provides the expected benefits in terms of operational efficiency. The more and better the e-banking quality provided to customers, the easier it will be to achieve efficiency because operational costs can be further reduced.
3. This research also proves that sharia banking can take more into account the role and influence of ICG in changing the relationship between the adoption of e-banking technology and the financial performance of sharia banking. This research proves that the adoption of e-banking technology guided by ICG has a positive impact on the sustainability and sharia compliance of sharia banking. Based on this research, the better the characteristics of top management and DPS characteristics, the better the performance of sharia banking. The development of these characteristics can be carried out by considering the number of top management members, gender diversity, education level, number of DPS members, DPS education level and the sharia/Islamic economics educational background of each DPS member.
4. This research provides valuable insights for Islamic banks in managing the adoption of e-banking technology and implementing ICG appropriately to improve overall Islamic banking performance. This research provides recommendations for Islamic banking and related stakeholders regarding best practices in adopting e-banking technology in line with ICG. These recommendations can cover aspects of policy, governance, risk management and technology implementation in accordance with sharia principles. This research can also be used as material for evaluating compliance with sharia principles, fulfillment of fatwa requirements, and ethical aspects in the use of digital technology that have been determined at this time whether they are still relevant or need to be updated.

This research can also provide implications for the development of regulations related to the adoption of e-banking technology in the sharia banking industry. The research results can provide input for regulators and policy makers to ensure that existing regulations and policies support the adoption of e-banking technology that is sustainable and in accordance with sharia principles.

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