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ELECTRONIC BANKING (E-BANKING) AND PERFORMANCE OF ISLAMIC COMMERCIAL BANKS IN INDONESIA

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Abstract:

One of the cashless transactions implemented by Islamic Commercial Banks in Indonesia is internet banking or Electronic Banking (e-banking). The purpose This study to examine the impact of the implementation of electronic banking (e-banking) on the financial performance of Islamic Commercial Banks in Indonesia. The population of this study consists of all Islamic Commercial Banks in Indonesia from 2013 to 2023. According to the Islamic Banking Statistical Data from the Financial Services Authority (*Otoritas Jasa Keuangan*) in 2013, there were 11 Islamic commercial banks in Indonesia. Due to mergers of several Islamic banks, this study obtained data from 6 Islamic commercial banks as samples. The research findings indicate that the implementation of Electronic Banking (EB) has a negative effect on Return on Assets (ROA). This result is suspected to be caused by the costs associated with electronic banking services, such as infrastructure, maintenance, and human resources, which require higher expenses compared to the revenue generated from internet banking services. Moreover, the increasing frequency of updates to electronic banking services could potentially lower the bank's profitability (ROA) due to the significant costs associated with updating devices, which in turn reduces income. Overall, the costs incurred by Islamic banks to provide internet banking services involve various large cost components, ranging from system development and maintenance to transaction costs, security, and Sharia compliance. The variables of SIZE, DEPOSIT, NPF,

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and OEOI have an impact on the performance of Islamic Commercial Banks in Indonesia.

Keywords:

E-banking, ROA, Performance, Islamic Banks.

Introduction

In the current global economy, digital finance is becoming increasingly influential, profoundly impacting every aspect of society (Zhou & Liao, 2024), driven by technological advancements such as the internet, big data, artificial intelligence, and blockchain. These technologies have become integral to daily life by offering more accessible, efficient, and cost-effective financial services. This shift enhances financial inclusion and presents new opportunities for commercial banks. As key entities in the financial system, commercial banks that develop clear and actionable digital strategies can secure a competitive advantage in the digital economy. Furthermore, the stability of commercial banks is critical to maintaining the overall stability of the financial system and fostering sustainable economic growth. Amid the digital financial revolution, it is essential to uphold the resilience of these banks' operations while simultaneously strengthening risk management frameworks across all dimensions. This dual focus on innovation, efficiency, and robust risk management is crucial to mitigating financial risks, protecting consumer rights and interests, and promoting the healthy development of commercial banking institutions. By achieving this delicate balance, we can ensure sustainable prosperity for both the banking sector and the broader economy (Liang et al., 2025).

The development of the internet has created opportunities that the banking sector has leveraged by introducing new activities in banking business processes, with a broader service reach. Banking services utilizing internet technology are referred to as e-banking. Banks that adopt internet banking can operate more effectively and efficiently in serving their customers. Internet banking or Electronic banking is a service accessible to customers for conducting banking activities via the internet. E-banking is a service provided by banks to customers by utilizing internet technology, typically through a website provided by the bank. E-banking has emerged as one of the most profitable e-commerce applications (Lee, M.C., 2009). The use of e-banking incurs the lowest costs compared to branch offices, telephone, ATMs, and PC banking, thereby enhancing the profitability of banks.

Currently, e-banking is a primary focus and a key strategy for every bank to capture their market share. E-banking has become a service provided by banks, allowing customers to perform banking financial activities electronically through the bank's website. Customers can conduct non-cash transactions anytime, easily and quickly, simply by accessing the service via their computer or mobile phone with an internet connection. Moreover, the use of the internet in banking activities can address a significant issue in the banking sector, which is reaching potential customers in remote areas that are difficult to access. To reach a large number of prospective customers, banks would traditionally need to establish numerous branch offices across various regions in Indonesia. However, with the presence of many branch offices, there is also a need for significant resources.

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By leveraging network technology, banks can enhance operational efficiency through reduced transaction costs and improved service quality (Uddin et al., 2020). According to a study by Booz and Hamilton (1999) in Callaway (2011), the cost of establishing a traditional/conventional bank is estimated at $25-30 million, compared to around $6 million for setting up internet banking. Further reports indicate that the transaction costs for full-service banking at a branch are $1.07 per transaction, $0.54 for telephone banking (mobile banking and SMS banking), $0.27 for ATM services, and $0.02 per transaction for internet banking (C. Pyun et al., 2002; Gopalakrishnan et al., 2003). Another benefit is that banking performance can be more efficient by reducing paper usage through the implementation of paperless systems, and banks generate revenue from fees imposed on customers. Therefore, bank income will increase from internet banking revenues. However, research by Al-Smadi & Al-Wabel (2011) suggests that internet banking has a negative impact on banking performance in Jordan.

The emergence of e-banking provides numerous benefits that are felt by the public, as they can conduct financial transactions using the internet, which is accessible 24 hours a day, without the need to visit a bank or an Automated Teller Machine (ATM). E-banking offers services such as transferring funds between the same or different banks, paying electricity, telephone, or credit card bills, checking account statements, and obtaining foreign exchange rate information. E-banking is considered a system where individuals, businesses, or customers have access to their accounts, conduct transactions or transfer money, pay bills, obtain information about their bank accounts, and utilize other banking-related services via the internet. Businesses that are able to address issues related to competition, time efficiency, and the ability to adopt the latest technology are better positioned to survive. The advantages of this service provide opportunities for the banking sector; although in the short term, banks incur substantial investment costs, in the long run, they can achieve cost efficiency and improve the effectiveness of their operations.

Several studies have examined the use of electronic applications and internet banking and their impact on bank performance. Research conducted by DeYoung (2001), Hasan (2002), Pigni et al. (2002), Kagan (2005), Arnaboldi and Claeys (2008), Ciciretti et al. (2009), and Weigelt and Sarkar (2012) indicates that the use of digital banking services with advanced technology can enhance the overall profitability of banks in the United States and European countries. Studies by Khrawish and Al-Sa'di (2011), Sumra et al. (2011), Malhotra and Singh (2006, 2007, 2009), and Gutu (2014) in developing countries such as India, Pakistan, Jordan, and Romania demonstrate that electronic banking applications reduce operational costs and improve banking profitability performance. A relatively short time is required to recover the initial setup costs for internet banking and other electronic-based activities, a situation that encourages the adoption of electronic banking in developing countries. Research by DeYoung (2001) shows that when banking transactions are conducted via websites or ATMs, transaction costs at branches can be reduced by 40%-80%, and the effectiveness of using electronic banking services has a positive impact on banking performance.

The findings are interesting as in Jordan, internet banking has a negative impact on the performance of banks. This research found that internet banking negatively affected the overall banking performance in Jordan, specifically in terms of profitability. This is particularly intriguing because banks that adopt internet banking should, in theory, be more effective and efficient in serving their customers. Not only in Jordan, but a similar trend was observed in India, where internet banking negatively impacted banks with capital of less than 100 million

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USD (Malhotra & Singh, 2009). The same result was found in the banking sector in Indonesia, where Egan & Prawoto (2013) discovered that internet banking had a significant negative effect on the profit growth of commercial banks using internet banking in Indonesia based on financial reports from 2002 to 2011 (Megawati & Kertiriasih, 2024). The cause is suspected to align with the findings in Jordan, where operational costs and maintenance of internet banking are still higher compared to the level of internet banking usage. However, research conducted by Liang et al. (2025) and Wang & Li (2023) indicates that digital finance has a positive impact on the operational efficiency of commercial banks listed in China.

Thus, several researchers have observed both positive and negative impacts of electronic banking (e-banking), while other researchers have drawn diverse conclusions. As a result, research on electronic banking remains inconclusive, as seen in studies by Megawati & Kertiriasih (2024), Amali & Selvi (2021), El Chaarani et al. (2018), Sudaryanti et al. (2018), Siddik et al. (2016), Al-Smadi & Al-Wabel (2011), Egan & Prawoto (2013), Onay & Ozsoz (2013), and Malhotra & Singh (2009).

Based on this research gap, further investigation is needed regarding digital banking services in Indonesia. Therefore, to address this gap, the aim of this study is to empirically investigate the impact of e-banking on bank profitability in Indonesia. This study contributes to the empirical literature by either reinforcing (or contradicting) the findings of previous research related to the impact of e-banking on bank profitability. The empirical findings from this study also hold significance for management development and e-banking, particularly e-banking, which will bring long-term benefits to the entire banking industry in Indonesia.

Theoretical

The rapid development of information and communication technology and changes in people's lifestyles must be immediately anticipated by the financial services sector, including the national banking industry. OJK has prepared various policies including the 2020-2025 general banking and sharia banking roadmap as a guide for the development of the banking industry in the future. The four strategic directions of national banking are set out in the roadmap, namely:

First, strengthening the structure and competitive advantage by increasing capital, accelerating consolidation and strengthening bank business groups, strengthening governance and efficiency, and encouraging product and service innovation.

Second, accelerating digital transformation through strengthening governance and risk management of information technology (IT), encouraging the use of IT as a game changer, increasing IT cooperation, and implementing advanced digital banks.

Third, strengthening the role of banking in the national economy by encouraging optimization of economic financing; deepening the financial market through multi-activities business; encouraging sharia banking to become a catalyst for the sharia economy; increasing access and financial education, and strengthening participation in sustainable financing.

Fourth, strengthening banking regulation, licensing and supervision through a principle-based approach, strengthening licensing through the use of technology, increasing supervision using technology (supervision technology/suptech) and strengthening consolidation supervision.

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As a follow-up to the roadmap, OJK recently issued POJK No. 12/POJK.03/2021 concerning Commercial Banks and POJK No. 13/POJK.03/2021 concerning the Implementation of Commercial Bank Products.

These two POJKs aim to improve institutional aspects by observing global dynamics, changes in the banking system and ecosystem and the needs of the community for future banking services, especially the development of digitalization.

This strategic POJK duo emphasizes the importance of accelerating digital transformation which is an incentive for banks to encourage innovation in banking products so that they can reach a higher level of economic scale and become a guide in the development of the banking industry.

The application of digitalization is also applied by OJK in its banking supervision duties. by implementing technology-based supervision (suptech) to obtain faster and more comprehensive results in accordance with technological developments in society

Internet banking or Electronic Banking is a development of internet technology used as a payment system in the banking world. According to Bank Indonesia, internet banking can be in the form of information internet banking, communicative internet banking, and transaction internet banking. Information internet banking is a bank service to customers in the form of information via the internet network and does not execute transactions (execution of transactions). Communicative internet banking is a bank service to customers in the form of communication or interaction with banks that provide internet banking services on a limited basis and do not execute and transact. Transactional internet banking is a bank service to customers to interact with banks that provide internet banking services and carry out execution and transactions. In addition, internet banking services are a form of transaction that is virtual or does not require a face-to-face process between the customer and the bank officer concerned.

The services provided in the e-banking system include inter-account fund transfer services, opening savings accounts, electronic bill payment systems. Banking through internet banking is divided into two types, the first is a bank that has a branch office building and creates an internet site and offers banking services provided through its branch offices, the second is a bank that only provides banking services through internet banking or a bank without a branch office (branchless) or also commonly called a virtual bank and internet only bank. While in the non-cash payment system, banking provides electronic or online transaction services to make transfers or save savings funds.

In addition to the many benefits obtained from internet banking services, there are also several risks in implementing an internet banking system. In general, there are management risks associated with the use of e-banking, namely technology risk, reputational risk, outsourcing risk, and legal risk. In response to this problem in the field of bank supervision, Bank Indonesia (BI) anticipated this by establishing Decree of the Board of Directors No. 27/164/Kep/Dir on March 31, 1995 concerning Information Technology by Banks. This Decree contains the obligation for banks to report to Bank Indonesia if the bank in question utilizes or develops information technology. However, this regulation was only issued in 2014. This was implemented because of the increasing development of banking services with internet banking, and attempts to protect consumers.

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Internet banking has a relationship with increasing profits. Basically, the internet banking feature is one of the innovations in technological developments that banks are trying to provide better services to their customers with the assumption of getting feedback in the form of increased banking profits.

In the development of electronic payment systems, services in branch offices will be reduced, and the provision of services using financial technology will continue to increase, such as the use of ATMs and other technologies. With the use of ATM cards and other types of banking technology media owned by customers today, customers can easily perform transaction services without having to waste a lot of time queuing at the bank office. The increase in users of non-cash payment systems in the future will be greater in proportion to the expansion of internet technology.

There are various types of banking services offered and integrated with digital services, namely:

1. Electronic Money (e-money): is a payment instrument that meets the following elements: a. Issued on the basis of the value of money deposited in advance to the issuer, b. The value of money stored electronically in a server or chip media, c. The value of electronic money managed by the issuer is not a deposit as referred to in the law governing banking.

2. Internet Banking. Customers can perform banking transactions (financial and non-financial) via a computer connected to the bank's internet network. Types of internet banking transactions include: Fund transfers; Balance information, account transfers, exchange rate information; Bill payments (eg: credit cards, telephone, mobile phones, electricity); and Purchases (eg: telephone credit top-ups, airline tickets, stocks).

3. SMS Banking is one of the features of banking information technology in the form of services for banking customers, which can allow customers to access their banking accounts via SMS. Types of transactions that can be done via SMS banking include: Fund transfers, Balance information, account mutations, and exchange rate information.

4. ATM cards are payment instruments using cards that can be used to make cash withdrawals and/or fund transfers where the cardholder's obligations are met immediately by directly reducing the cardholder's savings at a Bank or Institution Other than a bank that is authorized to collect funds in accordance with applicable laws and regulations.

The increasing use of ATM/Debit Cards is certainly due to the benefits of their use that have been widely felt by the public. The benefits of using ATM/Debit Cards are:

a. Provides convenience and speed of transactions via ATM for cash withdrawals, transfers between accounts and/or between banks.

b. In addition, specifically for Debit Cards, it provides convenience in making shopping transactions without having to carry cash.

5. A credit card is an APMK that can be used to make payments for obligations arising from an economic activity, including shopping transactions and/or to make cash withdrawals, where the cardholder's payment obligations are fulfilled first by the acquirer or issuer, and the

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cardholder is obliged to make payments at an agreed time, either by paying in full at once (charge card) or by paying in installments.

Research Method

The object of this study is Islamic Commercial Banks in Indonesia. The population of this study consists of all Islamic Commercial Banks in Indonesia from 2013 to 2023. According to the Islamic Banking Statistical Data from the Financial Services Authority (Otoritas Jasa Keuangan) in 2013, there were 11 Islamic commercial banks in Indonesia. Due to mergers of several Islamic banks, this study obtained data from 6 Islamic commercial banks as samples. The dependent variable used in this study is Return On Assets (ROA). Following past studies by Sufian and Habibullah (2009), Agustin et al. (2018), Fajri et al. (2022), Hassan et al. (2022), and Liang et al. (2025), we used bank performance as the dependent variable, which is a proxy for return on assets.

The panel data regression equation is as follows:

$$Y_{it} = \beta_0 + \beta_1 EB_{it} + \beta_2 SIZE_{it} + \beta_3 DEPOSIT_{it} + \beta_4 NPF_{it} + \beta_5 OEOI_{it} + \varepsilon_{it}$$

Information:

Y_{it} = Return On Assets (ROA)
EB = Electronic Banking
SIZE = Total Assets
DEPOSIT = Third-party funds
NPF = Non Performing Finance
OEOI = Operating Expenses divided by Operating Income

Results And Discussion

The results of data processing in this study showed that there was no multicollinearity in the regression model because the correlation between the independent variables was smaller than 0.8 (<0.8). There is no regression model from the heteroscedasticity of the Glejser test because the independent variable is not significant to the absolute residual (prob > 0.05). The results of data processing also show that there is no autocorrelation because the Durbin Watson value is 1.591 which is between 1 and 3.

Table 1: Multiple Regression Result

Variable	Commont Effect Model		Random Effect Model		Fixed Effect Model	
	Coef.	p-value	Coef.	p-value	Coef.	p-value
Constant	9.277	0.000***	-9.278	0.000***	8.060	0.003**
EB	-3.036	0.031**	-3.036	0.010**	-4.377	0.002***
SIZE	0.186	0.000***	0.187	0.000***	0.151	0.005**
DEPOSIT	-0.043	0.000***	0.043	0.000***	0.061	0.004***
NPF	-0.248	0.015**	-0.248	0.004***	-0.165	0.211
OEOI	0.064	0.004***	-0.064	0.001***	-0.076	0.000***
R-squared	0.428		0.428		0.636	
Adjusted R-squared	0.381		0.381		0.569	
Prob > F	0.000		0.000		0.000	

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Total of observation	66	66	66

**, **and * significant at 1%, 5% and 10% in term of p-value

The implementation of Electronic Banking (EB) has a negative effect on Return on Assets (ROA). This result is suspected to be caused by the costs associated with Electronic banking services, such as infrastructure, maintenance, and human resources, which require higher expenses compared to the revenue generated from internet banking services themselves. Moreover, the increasing frequency of updates to Electronic banking services could potentially lower the bank's profitability (ROA) due to the significant costs associated with updating devices, which in turn reduces income. Overall, the costs paid by Islamic banks to provide internet banking services involve various fairly large cost components, ranging from system development and maintenance to transaction costs, security, and sharia compliance. The estimated total costs incurred by Islamic banks for internet banking operations can range from IDR 500 million to IDR 10 billion per year, depending on the size of the bank, transaction volume, and complexity of the services provided. These costs will of course be charged to the bank's operational costs which can ultimately affect the cost of services provided to customers, although most of these costs are not directly charged to customers.

To provide a clearer picture of the costs paid by Islamic banks related to the use of internet banking, we can detail several types of costs that may be incurred by the bank. These costs vary depending on the policies of each Islamic bank and also based on the technology used. Below, I will provide an estimate of the costs in Rupiah based on the general cost categories incurred by Islamic banks.

1. Technology and Infrastructure Costs
• Development and Maintenance of IT Systems: Development and maintenance of IT systems for internet banking involves significant costs. These costs include the development of applications and backend systems, testing, and periodic updates. Cost estimates: Developing an internet banking system can require a very large initial investment, ranging from IDR 500 million to IDR 5 billion, depending on the complexity of the system and the features provided. Annual maintenance can reach IDR 100 million to IDR 1 billion per year.

• Procurement of Security Systems (encryption, OTP, etc.): Security systems are very important to prevent data theft and unauthorized transactions. This includes the token device (if used), encryption system, and application to generate OTP. Estimated costs: Procurement of security and encryption devices can require an initial cost of around IDR 200 million to IDR 2 billion. SMS or application-based OTP systems usually incur operational costs of around IDR 5 million to IDR 50 million per month for OTP management and delivery.

2. Transaction Fees
• Interbank Transaction Fees: If Islamic banks conduct interbank transactions using systems such as BI-FAST or RTGS, they will be charged a fee for each transaction made. These fees often vary based on the type of transaction. Estimated costs: For interbank transfers via BI-FAST or other systems, the fee charged by the bank for each transaction usually ranges from IDR 6,500 to IDR 20,000 per transaction. For RTGS transactions, the fees can be higher, around IDR 25,000 to IDR 50,000 per transaction, depending on the bank and type of service.

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• Bill Payment or Product Purchase Fees: Fees incurred for bill payment services (electricity, telephone, credit cards, etc.) made by Islamic bank customers via internet banking. Estimated fees: Fees charged to the bank by bill or product service providers are usually around IDR 2,000 to IDR 10,000 per transaction.

3. Infrastructure and Connection Fees
• Network and Communication Fees: Islamic banks need to ensure stable and secure connectivity for internet banking, which involves the cost of providing internet and communication networks. Estimated fees: Monthly fees for a reliable internet connection can reach IDR 10 million to IDR 100 million per month, depending on the capacity and speed of the network required.

• Cloud and Data Storage Costs: Many Islamic banks use cloud services for data storage and internet banking applications. Cloud service providers such as AWS, Google Cloud, or Microsoft Azure typically charge based on storage capacity and usage. Estimated costs: Cloud-based data storage and applications can cost around IDR 10 million to IDR 200 million per month, depending on the volume of data and complexity of the application.

4. Security and Data Protection Costs
• Data Security Costs: To ensure customer data is protected, Islamic banks must implement a robust security system. This includes antivirus software, firewalls, and security audits. Estimated costs: Procuring and maintaining a security system can cost around IDR 50 million to IDR 500 million per year.

5. Sharia Compliance Costs
• Compliance with Sharia Principles: Islamic banks need to ensure that all transactions conducted through internet banking comply with sharia principles. This involves consulting fees with the Sharia Supervisory Board (SSB), sharia audits, and developing systems that comply with sharia law. Estimated costs: Consultation fees with the Sharia Supervisory Board can range from IDR 50 million to IDR 500 million per year. Annual sharia audit fees to ensure systems and transactions are in accordance with sharia principles can reach IDR 100 million to IDR 1 billion per year.

6. Other Operational and Maintenance Costs
• System and Application Maintenance: Islamic banks need to carry out regular maintenance and updates for their internet banking systems, including fixing bugs and improving functionality. Estimated costs: Internet banking system and application maintenance costs can reach IDR 200 million to IDR 2 billion per year, depending on the size and complexity of the system.

7. Customer Service Costs
• Customer Service Center (Call Center): Islamic banks must provide a customer service center to assist customers using internet banking. This involves operational costs for the call center, including staff training. Estimated costs: The cost of operating a call center and technical support can reach IDR 50 million to IDR 500 million per month, depending on the volume of customers and the level of support provided.

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This condition may occur for several reasons. First, the adoption of e-banking by Islamic banks leads to an increase in the company's investment in information technology, so the substantial investment in information technology may reduce net income in the short term, resulting in a decline in the ratio of net income to total assets (ROA). Second, the increase in the adoption of e-banking technology innovations is not followed by a corresponding increase in the number of Islamic bank customers using these facilities. Third, there is a concern among bank customers regarding the risks associated with using e-banking and internet banking services. This is due to the frequent cases of fund and data breaches involving banking customers in Indonesia. The findings of this study support previous research conducted by Diyanti (2019).
To address these issues, banking institutions can implement efficiency measures in the development of new features for internet banking services, such as payment, transfer, top-up, e-wallet, and other effective features that prioritize meeting customer needs for conducting various banking transactions. This can help increase fee-based income for the bank, thereby improving its profitability. Banking institutions should also actively promote and socialize the use of internet banking services to enhance customer attraction, which in turn can generate profits for the bank. The most important aspect is to optimize the features of internet banking services in order to reduce or minimize cost reductions, thus achieving an increase in the bank's revenue and profit.

SIZE has a positive effect on ROA. A bigger bank has a better performance. A big bank has low fees because there are economies of scale. In addition, a big bank can diversify its income source by taking advantage of various types of investment opportunities. For example, a large bank can take on a riskier project or provide a larger loan to a company. The result of this study is in line with research conducted by Abduh and Issa (2018), Watuseke et.al (2019), Sanusi and Zulaikha (2019), Rahman et.al (2020), Dan and Anh (2020) and Fithriyanto (2021).) but it is different from the result of research by Supiyadi and Nugraha (2018) and Farooq et.al. (2021). DEPOSIT have a negative effect on ROA. This contradicts the prediction, as the profit-sharing ratio on financing should be higher than the profit-sharing ratio paid to third-party funds or depositors. NPF (Non-Performing Financing) has a negative effect on ROA. Credit risk is considered the highest risk among many risks in the banking industry. Credit risk is the largest contributor to potential losses for banks (Arif & Masdupi, 2020). The increased risk of losses will result in a decline in bank performance. Credit risk is one of the primary causes affecting company performance. Therefore, banks will minimize financing risks in order to maximize profits, thereby improving performance.

OCOI has a negative effect on ROA. Any increase in operating costs that is not followed by operating income will result in reduced profit before tax and will result in ROA. The operational cost ratio is used to measure the level of efficiency and ability of a bank to carry out its operational activities. The smaller this ratio, the more efficient the operational costs incurred by the bank so that the possibility of a bank in a troubled condition also becomes smaller. The greater the OCOI, the smaller the bank's ROA, because the profit earned by the bank is also small. This shows that the increase in the bank's OCOI ratio indicates an increase in the proportion of operating expenses to operating income received by the bank, thus if operating costs increase it will reduce profit before tax which will ultimately reduce ROA at the bank concerned, by thus the greater the OCOI, the smaller the bank's ROA, because the profit earned by the bank is also small. This reflects the presence or occurrence of inefficiencies in operational performance at Islamic commercial banks. The results of this study are in line

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with the research of Azizah & Manda (2021), Yuliana and Listari (2021), Hasibuan et al (2021) and Astuti (2022).

Conclusion

The implementation of Electronic Banking (EB) has a negative effect on Return on Assets (ROA). This result is suspected to be caused by the costs associated with Electronic banking services, such as infrastructure, maintenance, and human resources, which require higher expenses compared to the revenue generated from internet banking services themselves. Moreover, the increasing frequency of updates to Electronic banking services could potentially lower the bank's profitability (ROA) due to the significant costs associated with updating devices, which in turn reduces income. Overall, the costs paid by Islamic banks to provide internet banking services involve various fairly large cost components, ranging from system development and maintenance to transaction costs, security, and sharia compliance. The estimated total costs incurred by Islamic banks for internet banking operations can range from IDR 500 million to IDR 10 billion per year, depending on the size of the bank, transaction volume, and complexity of the services provided. These costs will of course be charged to the bank's operational costs which can ultimately affect the cost of services provided to customers, although most of these costs are not directly charged to customers. The variables of SIZE, DEPOSIT, NPF, and OEOI have an impact on the performance of Islamic Commercial Banks in Indonesia.

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