

EXAMINING THE MODERATING EFFECT OF BANK SIZE ON THE FINANCIAL RISK AND PERFORMANCE LINKAGE OF ISLAMIC COMMERCIAL BANKS

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Abstract

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Financial performance is very important for Islamic banks to ensure the sustainability of their business in providing banking products and services according to Sharia principles or Islamic law. This research examines the impact of financial risk on the financial performance of Indonesian Islamic commercial banks (ICBs), with bank size as a moderating variable. The research was conducted on all Indonesian ICBs from 2017–2021. Fixed effects models are employed to account for potential heterogeneity across banks and control for time-invariant unobserved factors. These models allow for estimating the within-bank variation over time, capturing constant bank-specific characteristics over the study period. The results of this research state that financing and operational risks significantly negatively impact financial performance. In contrast, liquidity risk does not significantly negatively impact financial performance. Furthermore, from testing the moderation hypothesis, the results of this study state that total financing reduces the significant negative effect of financing risk and operational risk on ICB Indonesia's financial performance. However, total financing does not reduce the significant negative effect of liquidity risk on the financial performance of Indonesian ICBs.

Keywords: Financial Risk, Financial Performance, Bank Size, Islamic Commercial Bank

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1. INTRODUCTION

Islamic commercial banks (ICBs) are Islamic banks that provide services in payment traffic. ICBs has been operating in Indonesia since the establishment

of Bank Muamalat Indonesia (BMI) in 1992 as the first Islamic bank. In its development at the end of 2022 in Indonesia, there are 13 ICBs supported by total assets of IDR520.89 billion. The financial performance of Islamic banks can be seen from

the profitability ratio return on assets (ROA), which describes their performance in achieving profits by managing their total assets (Fatmawati & Hakim, 2020). The main business activity of ICBs is to collect and distribute funds to the public using Sharia principles, which do not contain usury, uncertainty, gambling, tyranny, and other unlawful elements prohibited in Islamic law (Estiawan & Asrori, 2021). The role of ICBs in Indonesia is crucial, in line with its potential as a country with the largest Muslim population in the world. Based on data from the Central Statistics Agency (*Badan Pusat Statistik* — BPS) for 2022, it is stated that Indonesia's population at the end of 2022 will be 277.75 million people, of which 241.7 million people (87%) are Muslims.

Indonesian ICBs' financial performance (ROA) for five years (2017–2021) refers to Sharia Banking Statistics from the Indonesian Financial Services Authority (*Otoritas Jasa Keuangan* [OJK], 2022), namely 0.6% in 2017, 1.28% in 2018, 1.73% in 2019, 1.40% in 2020, and 2.05% in 2021. The achievement of financial performance at ICBs Indonesia 2017–2021 varies greatly each year, which is an interesting phenomenon to identify and analyze what factors cause it. Recent research that examined the financial performance of conventional and Islamic banks in Indonesia for the 2012–2016 period, stated that the financial performance of Indonesian banks was determined by financial risk (Saiful & Ayu, 2019). Referring to the Sharia Banking Statistics published by OJK (2022), it is stated that the financial risks of Indonesian ICBs for five years from 2017 to 2021 including liquidity risk (financing to deposit ratio — FDR) are 79.61% in 2017, 78.53% in 2018, 77.91% in 2019, 76.36% in 2020, and 70.12% in 2021. Financing risk (non-performing financing — NPF) was 4.76% in 2017, 3.26% in 2018, 3.23% in 2019, 3.13% in 2020, and 2.59% in 2021. Operational risk (operating expense ratio — OER) was 94.91% in 2017, 89.18% in 2018, 84.45% in 2019, 85.55% in 2020, and 84.33% in 2021.

The financial risks at Indonesian ICBs in 2017–2021 indicate that the conditions and level of financial risk each year vary widely and tend to be unstable. This research aims to examine the impact of financial risk on the financial performance of Indonesian ICBs. This research is seen as an essential research alternative because the financial performance of Indonesian ICBs for 2017–2021 shows varying symptoms every year. In addition, every Indonesian ICB faces different conditions and levels of financial risk, both in terms of liquidity risk/FDR (Ardana, 2018; Fatmawati & Hakim, 2020), operational risk/OER (Mardiana, 2018; Dewi & Sudarsono, 2021), and financing risk/NPF (Darma & Afandi, 2021).

Several recent studies regarding the effect of financial risk on the financial performance of Islamic banks in Indonesia have been carried out. Prasaja (2018) reviewed the financial performance of Islamic banks in Indonesia for the 2014–2016 period. The results of his research stated that financing risk (NPF) had no significant adverse effect on the financial performance (ROA) of Islamic banks. In contrast, liquidity risk (FDR) and operational efficiency risk (OER) have a significant positive effect on the financial performance of Islamic banks. Mardiana (2018) analyzed the effect of financial risk on the financial performance of Islamic banking in

Indonesia from 2011 to 2016. The results of his research stated that NPF had no significant adverse effect on the ROA of Islamic banks. In contrast, OER significantly adversely affects Islamic banks' ROA. Ardana (2018) examined the external and internal factors that affected the profitability of Islamic banks in Indonesia from 2011 to 2018. The results of his research stated that NPF had a significant adverse effect on Islamic banks' profitability (ROA). In contrast, FDR and OER have a significant positive effect on the ROA of Islamic banks.

Fatmawati and Hakim (2020) conducted a study on the influence of financial risks on the performance of Islamic banks from 2009 to 2018. Their findings revealed that FDR and OER exhibited a notable and detrimental effect on the ROA of Islamic banks. Conversely, NPF did not show a significant negative impact on ROA. On the other hand, Dewi and Sudarsono (2021) investigated the ROA of Islamic banks in Indonesia using the autoregressive distributed lag (ARDL) methodology from January 2015 to July 2021. Their research outcomes demonstrated that NPF had a noteworthy adverse influence on ROA. In contrast, OER did not display a significant detrimental effect on ROA.

In a recent study conducted by Nurwulandari et al. (2022), the impact of risk management on the growth of profitability in Indonesian Islamic banks during 2018–2021 was examined. Their research findings indicated that NPF had a noteworthy and adverse influence on Islamic banks' ROA. Conversely, OER significantly and positively affected these banks' ROA. Similarly, the research undertaken by Riyadi et al. (2022) focused on analyzing the influence of capital and liquidity risk factors on the profitability of Islamic banks in Indonesia for 2014–2019. Their study outcomes revealed that the capital factor substantially and negatively impacted Islamic banks' ROA. In contrast, FDR did not significantly impact Islamic banks' ROA. Additionally, the work of Pujiyanty et al. (2022) involved an analysis of the profitability of Indonesian ICBs during the timeframe of 2015–2019. Their research findings suggested that FDR exhibited a noteworthy and positive effect on the ROA of ICBs. This positive impact was attributed to the notion that a higher level of liquidity reflects a bank's health, indicating effective capital management and contributing to enhanced profitability.

Referring to several studies that examine the effect of financial risk on the financial performance of Islamic banks in Indonesia, as described above, the research results indicate that the impact of financial risk on financial performance could be more consistent. The following research gaps are found: First, several studies stated that FDR has a significant positive impact on the ROA of Islamic banks (Ardana, 2018; Fatmawati & Hakim, 2020; Prasaja, 2018; Pujiyanty et al., 2022). Meanwhile, the results of the latest research by Riyadi et al. (2022) stated that FDR did not have a significant positive impact on the ROA of Islamic banks. Second, several recent studies stated that NPF has a significant negative impact on the ROA of Islamic banks (Ardana, 2018; Dewi & Sudarsono, 2021; Prasaja, 2018). Meanwhile, research conducted by Mardiana (2018) states that NPF has no significant negative impact on the ROA of Islamic banks. Third, several studies state that OER has

a significant positive impact on the ROA of Islamic banks (Ardana, 2018; Prasaja, 2018). Meanwhile, several other researchers stated that OER has a significant negative impact on the ROA of Islamic banks (Mardiana, 2018; Dewi & Sudarsono, 2021).

This study aims to address a gap in existing research by introducing a moderating variable that could influence the association between financial risk and the financial performance of Islamic banks. The research examines the moderating effect of bank size on the relationship between various financial risks (liquidity risk, financing risk, and operational efficiency risk) and the financial performance of Islamic banks in Indonesia. Through this investigation of the moderating variable, specifically the impact of bank size, the study sheds light on how it might explain discrepancies observed in prior research. By conducting a thorough analysis, the research will put forward hypotheses and enhance our comprehension of how moderating variables, such as bank size, can shape the correlation between financial risk and financial performance within the context of Indonesian Islamic banks. Consequently, this study is anticipated to significantly contribute towards bridging the current gap in research, offering a deeper understanding of the factors influencing the financial performance of Islamic banks in Indonesia.

Furthermore, the difference between this research and several previous studies (Leong & Dollerym, 2004; Aladwan, 2015; AlFadhli & AlAli, 2021) lies in measuring bank size and its impact on the financial performance of Indonesian ICBs. The previous studies examined the impact of bank size on financial performance using different measures. In contrast, this study focuses on using total financing to measure bank size for Indonesian ICBs. Leong and Dollerym (2004) found that large banks in Singapore with relatively large asset sizes enjoyed economies of scale, resulting in lower overhead costs and more excellent financial performance than small banks. On the other hand, Aladwan (2015) tested the effect of bank size on Jordanian commercial banks and found that small and medium-sized banks had higher ROA compared to large banks. In contrast, AlFadhli and AlAli (2021) researched the effect of bank size on the financial performance of Islamic banks in Kuwait and found that the size of a bank's assets was inversely related to its ROA. These inconsistent findings highlight the controversial relationship between bank size and financial performance in Islamic banks. This study uses total financing to measure bank size in Indonesian ICBs to provide further insights into whether bank size weakens or strengthens the effect of financial risk on the financial performance of Indonesian ICBs.

In line with the objectives of this research, the research questions (RQ) posed in this study are as follows:

RQ1: What is the impact of liquidity risk (FDR) on the financial performance (ROA) of Indonesian ICBs?

RQ2: What is the impact of efficiency risk (OER) on the financial performance (ROA) of Indonesian ICBs?

RQ3: How does financing risk impact the financial performance of Indonesian ICBs?

RQ4: What is the impact of bank size on the relationship between liquidity risk and financial performance in Indonesian ICBs?

RQ5: What is the impact of bank size on the relationship between efficiency risk and financial performance in Indonesian ICBs?

RQ6: What is the impact of bank size on the relationship between financing risk and financial performance in Indonesian ICBs?

The subsequent sections of this research paper consist of the literature review, hypothesis formulation, research methodology, results and discussion, and conclusion. The literature review in Section 2 will summarize relevant previous studies, aiming to comprehensively understand the variables involved, the relationships explored, and the divergent findings in prior research. Subsequently, hypotheses will be constructed to tackle the existing research disparities, taking into account the moderating influence of bank size (total financing) on the connection between financial risk (liquidity risk, financing risk, and operational efficiency risk) and the financial performance of ICBs in Indonesia. The research methodology will be described in Section 3, encompassing the research design, sample selection, data collection, and the statistical techniques employed to test the formulated hypotheses. Subsequently, the results and discussion in Section 4 will present the findings, including the data analysis and interpretations, comparisons with previous studies, and the implications derived from the research findings. Finally, the conclusion in Section 5 will summarize the research outcomes, link them to the formulated hypotheses, and provide overall conclusions and suggestions for further research based on the discussed findings.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Financial performance and management risk of Islamic banks in Indonesia

ROA in the recent banking literature is the most critical profitability indicator to determine the financial performance of Islamic banks. ROA describes how the bank successfully uses its funds to generate profits as a percentage of each unit of assets. By evaluating ROA, Islamic banks can estimate future profit (Ateeq et al., 2021). The evaluation of the financial performance of Indonesian ICBs typically quantified through ROA, indicates the banks' capacity to generate earnings derived from the utilization of their assets by Islamic principles for delivering banking offerings and services (Ardana, 2018; Ubaidillah & Astuti, 2020; Prasaja, 2018).

To ensure the sustainability of their operations in providing banking products and services by Islamic law, Indonesian ICBs must strive to generate profitability and enhance their financial performance measured by ROA (Ardichy & Rahayu, 2022). Good ROA will increase public confidence in saving funds, applying for financing, and making transactions with Islamic banks (Dewi & Sudarsono, 2021).

Islamic banks face various risks as intermediary financial institutions that collect and channel funds from and to the community. In this case, Islamic bank management is required to be able to implement risk management that meets Sharia compliance and applicable regulations. The risk management principles applied to Islamic banks in

Indonesia by the Indonesian OJK are directed in line with the standard rules issued by the Islamic Financial Service Board (IFSB) (Rustam, 2018). Indonesian OJK Regulation No. 65 (*Peraturan Otoritas Jasa Keuangan — POJK*) outlines the framework for risk management practices within Indonesian Islamic banks. This regulation pertains to implementing risk management for Islamic commercial banks and Sharia business units. The document specifies that risk management in Islamic banking encompasses a spectrum of risks, including but not limited to financing, market, liquidity, operational, legal, reputation, strategic, compliance, rate of return, and equity investment risks.

Mardiana (2018), examining the impact of risk management on the financial performance of Islamic banking listed on the Indonesia Stock Exchange for the 2011–2016 period, states that the more effective the application of financial risk, the higher the financial performance of Islamic banks. In line with the results of research by Reyad et al. (2022), which examines the financial performance of Islamic banks in the Gulf Cooperation Council (GCC) countries for the 2013–2019 period states that one of the important determinants of the financial performance of Islamic banks is financial risk, the more effective the implementation of financial risk, the higher the financial performance of Islamic banks. Recent research by Falikhatun and Mutiarafah (2021) that examines management risk on the financial performance of Islamic banking in Indonesia for the 2015–2019 period recommends the importance of mitigating financial risk to maintain the reputation of Islamic banking and create innovative financing products to improve its financial performance.

2.2. The impact of liquidity risk on financial performance

Liquidity risk holds significant importance as a financial risk in Indonesian Islamic banks. As defined by Indonesian OJK Regulation No. 65/POJK.03/2016, liquidity risk refers to a financial peril wherein a bank encounters difficulty meeting its impending obligations utilizing cash flow funding avenues or readily available high-quality liquid assets without disrupting the bank's operations and overall financial standing. In Islamic banks, the liquidity risk assessment is gauged through the utilization of the FDR metric. This metric provides insight into the level of financial liquidity across all financing activities facilitated by external funding sources or public deposits (Ardana, 2018; Fatmawati & Hakim, 2020; Prasaja, 2018; Pujiyanty et al., 2022).

Islamic banks are intermediary financial institutions. Based on the theory of financial intermediation, Islamic banks play an essential role in the development and improvement of economic activity due to their ability to create liquidity by collecting funds from the public through various deposit products and channeling them to the public as financing in the real economy sector, as well as being able to transform liquidity risk effectively and efficiently (Hosen et al., 2021). The research results by Hosen et al. (2021) showed that the liquidity creation of Indonesian Islamic banks in

the 2011–2020 period has increased yearly. In addition, the capability of Indonesian Islamic banks to create liquidity from equity is stated to be in good condition. Every IDR100 of equity can generate more than IDR100 of liquidity.

Recent research examining the effect of liquidity on the financial performance of Islamic banks in Indonesia (Ardana, 2018; Fatmawati & Hakim, 2020; Prasaja, 2018), stated that FDR has a significant positive impact on the ROA of Islamic banks. Pujiyanty et al. (2022) state that FDR has a positive and significant effect on ROA in Indonesian ICBs because a high level of liquidity reflects the soundness of a bank's financial condition and illustrates that banks can manage their funds appropriately and increase their profitability. The higher the FDR will increase its ability to generate profitability and improve the ROA of Indonesian ICBs. Based on the description above, the first hypothesis proposed in the study is as follows:

H1: Liquidity risk (FDR) has a significant positive impact on the financial performance (ROA) of Indonesian ICBs.

2.3. The impact of financing risk on financial performance

Financing risk is a significant indicator of business risk in the Indonesian Islamic bank (Santoso, 2020; Darma & Afandi, 2021). While the allocation of funds to clients within Islamic banks operates through a financing mechanism, it is noteworthy that Indonesian OJK Regulation No. 65/POJK.03/2016 employs the term "credit risk" for this context. This regulation outlines credit risk as arising from the inability of customers or other relevant parties to fulfill their commitments to the bank in accordance with established agreements. This encompasses various facets of credit risk, including potential defaults by debtors, risks associated with credit concentration, counterparty credit risk, as well as settlement risk.

Financing risk is the risk caused by the customer's failure to fulfill their obligations to the bank at maturity, which is measured by NPF (Ardana, 2018; Dewi & Sudarsono, 2021; Prasaja, 2018). Agustin and Darmawan (2018), Santoso (2020), Dasari and Wirman (2020), and Darma and Afandi (2021) stated that NPF harms the ROA of Islamic banks in Indonesia. The greater the NPF, the higher the financing risk the bank faces, and will reduce its profitability and ROA (Santoso, 2020). Based on the description above, the second hypothesis proposed in the study is as follows:

H2: Financing risk (NPF) has a significant negative impact on the financial performance (ROA) of Indonesian ICBs.

2.4. The impact of operational risk on financial performance

Operational risk is a crucial business risk indicator of Islamic banking. As per the guidelines outlined in Indonesian OJK Regulation No. 65/POJK.03/2016 on the Implementation of Risk Management for Sharia Commercial Banks and Sharia Business Units,

operational risk within Islamic banks refers to the potential for financial loss arising from insufficient internal processes, which can lead to failures in internal procedures, system malfunctions, human errors, or external occurrences or influences that impact the operational functioning of the bank. Islamic banks' operational risks can be divided into three categories: business risk, Sharia non-compliance risk, and legal risk (Zeineb & Mensi, 2018). First, business risk is the operational risk that is a consequence of various types of businesses, whether by Sharia principles or not, such as using asset-based financing with *murabahah*¹, *salam*², *istisna'a*³, and *ijarah*⁴ contracts. Second, Sharia non-compliance risk is the risk of non-compliance with Sharia rules and principles in the business activities of Islamic banks. Third, legal risk arises either as a result of illegal Sharia bank business operations or problems of legal uncertainty in interpreting and enforcing Islamic contracts. The research focuses on the effect of operational risk on the financial performance of Indonesian ICBs concerning business risk.

The operational risk associated with business risk in Islamic banks is generally measured using the OER indicator, which shows the effectiveness and efficiency of using operational costs to obtain operating income. Recent research states that OER has a significant adverse effect on the ROA of Indonesian Islamic banks (Mardiana, 2018; Dewi & Sudarsono, 2021). Facing business operational risk requires Islamic bank management to manage OER using operational costs effectively and efficiently to generate maximum operating income. The smaller the OER, the more effective and efficient Islamic banks manage costs to obtain operating income to improve their ROA (Agustin & Darmawan, 2018). Based on the description above, the third hypothesis proposed in the study is as follows:

H3: Operational risk (FDR) significantly negatively impacts the financial performance (ROA) of Indonesian ICBs.

2.5. Bank size as a moderator

The effectiveness of Islamic banks' financial performance is shaped not only by financial risk but also by the scale of the bank. A larger bank size corresponds with more streamlined operational processes, potentially enhancing bank performance. Nonetheless, the present research findings indicate no statistically significant correlation between the size of the bank and the financial performance of Islamic banks (AlFadhli & AlAli, 2021). The primary objective of this study is to bridge the current research void concerning the influence of bank size on the financial performance of Islamic banks. More precisely, it delves into the capacity of

bank size to act as a moderator in the interplay between financial risk and the financial performance of Islamic banks in Indonesia.

Then, the theory of economies of scale was used to develop the hypothesis of bank size as a moderation of the effect of financial risk on financial performance (McGee, 2015). This theory explains that the management of sizeable economic scale organizations will become more effective and efficient only if the organization has developed innovative financial technology (fintech) in its business operations, which can provide information for making the right decision to executives and managers in all the lines of the organizational structure; thereby enhancing the development of control techniques based on management accounting, budgeting, and cash flow analysis; as well as making the company's products and services provided faster, easier, more effective, efficient, and convenient for its customers.

The theory of economies of scale (McGee, 2015) is used in this study because it is supported by the empirical results of several recent studies, which state that Islamic banks in Indonesia have developed fintech based on modern information and communication technology in providing products and services. Banking services, including digital banking services such as SMS and mobile banking via the Internet, have gained popularity among consumers, particularly millennials, in Indonesia (Riza, 2019; Anindyastri et al., 2022). The adoption of digital banking in delivering banking products and services has been well-received by customers of Islamic banks in the country. Mobile banking services have positively impacted the financial performance of Indonesian Islamic banks (Anindyastri et al., 2022).

Based on the description above, the formulations of the fourth, fifth, and sixth hypotheses regarding bank size as a moderation of the impact of financial risk on the financial performance of Islamic banks are as follows:

H4: Bank size reduces a significant positive impact of liquidity risk (FDR) on the financial performance (ROA) of Indonesian ICBs.

H5: Bank size reduces a significant negative impact of financing risk (NPF) on the financial performance (ROA) of Indonesian ICBs.

H6: Bank size reduces a significant negative impact of operational efficiency risk (OER) on the financial performance (ROA) of Indonesian ICBs.

3. RESEARCH METHODOLOGY

3.1. Presentation of the sample

This study's population of Islamic banks are all ICBs operating in Indonesia. The research sample was selected purposively with the following criteria: First, ICBs have been registered with the OJK. Second, ICBs publish annual reports containing complete information related to the research variables observed during 2017–2021. Based on the criteria, the research sample is presented in Table 1.

¹ *Murabahah* is selling a commodity as per the purchasing price with defined and agreed profit mark-up (The Accounting and Auditing Organization for Islamic Financial Institutions [AAOIFI], 2015).

² A *salam* transaction is the purchase of a commodity for deferred delivery in exchange for immediate payment (AAOIFI, 2015).

³ *Istisna'a* is a contract of sale of specified items to be manufactured or constructed, with an obligation on the part of the manufacturer or builder (contractor) to deliver them to the customer upon completion (AAOIFI, 2015).

⁴ The term *ijarah* means leasing of property pursuant to a contract under which a specified permissible benefit in the form of a usufruct is obtained for a specified period in return for a specified permissible consideration (AAOIFI, 2015).

Table 1. Research sample

No.	Criteria	2017	2018	2019	2020	2021	Analysis units
1.	ICBs registered with Indonesian OJK for the 2017–2021 period	13	14	14	14	12	67
2.	ICBs do not publish financial reports and annual reports containing complete information regarding research variables	1	2	1	1	2	7
3.	Number of unit analysis	12	12	13	13	10	60

3.2. Data, operational definitions, and variables measurements

This study uses secondary data obtained from annual reports of all ICBs in Indonesia for five years from 2017 to 2021. The data collected includes all research variables, including financial performance, liquidity risk, operational risk, financing risk, and bank size. The operational interpretation and quantification of variables adhere to the guidelines stipulated by Indonesian OJK Regulation No. 65/POJK.03/2016 regarding the Implementation of Risk Management for Islamic Commercial Banks and Islamic Business Units; Indonesian OJK

Regulation No.8/POJK.03/2014 concerning the Evaluation of Soundness Levels for Islamic Commercial Banks and Islamic Business Units; Indonesia OJK Circular Letter No. 10/SEOJK.03/2014 concerning the Appraisal of Soundness Levels for Islamic Commercial Banks and Islamic Business Units. Furthermore, these parameters have been incorporated and applied in recent studies, ensuring alignment and consistency (Agustin & Darmawan, 2018; Darma & Afandi, 2021; Dasari & Wirman, 2020; Pujiyanty et al., 2022; Santoso, 2020). The operational definition and measurement of variables in this research are presented in Table 2 as follows:

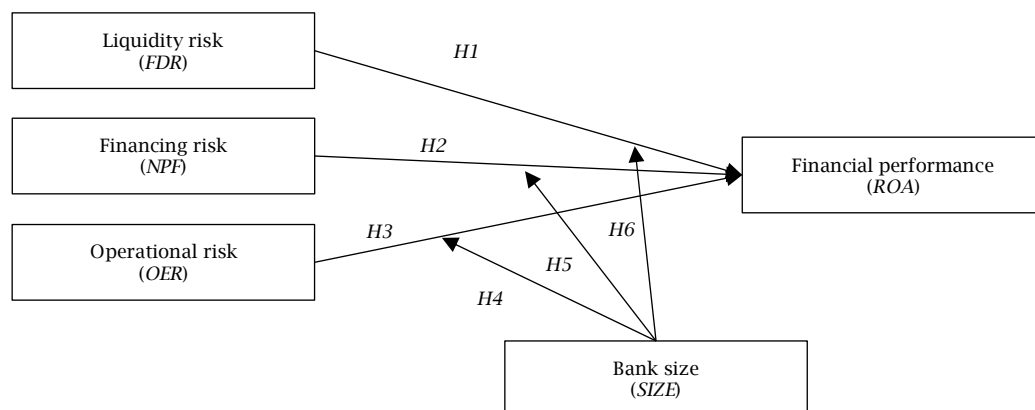
Table 2. Operational definition and measurement of research variables

No.	Research variables	Operational definition	Measurements
1.	Financial performance (ROA)	The ability of a bank to obtain profit from its business activities with all its assets is measured by the profitability level of return on assets (ROA).	$ROA = \text{Profit before tax} / \text{Total assets}$
2.	Liquidity risk (FDR)	The bank's risk arises from the inability to meet maturing obligations from cash flow funding sources from third-party funds used to fund financing, as measured by the financing to deposit ratio (FDR).	$FDR = \text{Total financing} / \text{Third party funds} \times 100\%$
3.	Financing risk (NPF)	The bank's risk is due to customer failure to meet returns on financing received and past due, as measured by non-performing financing (NPF).	$NPF = \text{Problem financing} / \text{Total financing} \times 100\%$
4.	Operational risk (OER)	The bank's risk describes the level of efficiency in controlling operational costs in carrying out its business activities to obtain operating income, which is measured using the operating efficiency ratio (OER).	$OER = \text{Operating cost} / \text{Operating income} \times 100\%$
5.	Bank size (SIZE)	Bank size shows the scale of the bank as measured by the total amount of financing distributed to customers using <i>mudharabah</i> , <i>musyarakah</i> , <i>murabahah</i> , <i>istishna</i> , <i>ijarah</i> , and <i>qardh</i> contracts.	$SIZE = \Sigma \text{Total financing}$

3.3. Research model

Based on the literature review, the proposed research model is presented in Figure 1. The model shows the impacts of liquidity risk (FDR), financing

risk (NPF), and operational risk (OER) on the financial performance (ROA) of Indonesian ICBs. This model includes testing bank size (SIZE) as a moderating variable for the influence of the impacts of FDR, NPF, and OER on the ROA of Indonesian ICBs.

Figure 1. Research model

3.4. Data analysis and hypotheses testing

This study's data analysis encompassed both descriptive statistical examination and panel data regression analysis. Descriptive statistical analysis was employed to portray the characteristics of each distinct research variable. This involved detailing

$$ROA_{it} = \alpha + \beta_1 FDR_{it} + \beta_2 NPF_{it} + \beta_3 OER_{it} + \varepsilon_{it} \quad (1)$$

$$ROA_{it} = \alpha + \beta_1 FDR * SIZE_{it} + \beta_2 NPF * SIZE_{it} + \beta_3 OER * SIZE_{it} + \varepsilon_{it} \quad (2)$$

Furthermore, to test the independent and the moderation hypothesis, a partial test (t-test) is used with the decisions: If the probability value (p) is $\leq \alpha = 0.05$, the independent variables and moderating variables have no significant effect, and vice versa.

4. RESULT AND DISCUSSION

4.1. Results of descriptive statistical analysis

The variables observed in this study include financial performance (ROA), liquidity risk (FDR), financing risk (NPF), operational risk (OER), and bank size ($SIZE$). The descriptive statistical analysis results are presented in the following table based on the research variables mentioned above.

Referring to the variable descriptive statistics presented in Table 3, a detailed description of the research variables follows.

1. The average financial performance (ROA) of Indonesian ICBs is 0.012593 (1.26%). According to Indonesian OJK regulations, a healthy bank's financial performance standard is $ROA \geq 1.50\%$. Thus, in general, the ROA of Indonesian ICBs does not include healthy banks. The standard deviation of $ROA = 0.37427 > \text{Mean } ROA = 0.012593$ shows that the financial performance of Indonesian ICBs varies widely, where the highest is 13.58%, and the lowest is -10.10%.

2. The average liquidity risk (FDR) of Indonesian ICBs is 0.842978 (84.3%). According to Indonesian OJK regulations, a healthy bank's liquidity

the observed data for variables and elucidating statistics such as mean, standard deviation, variance, maximum, and minimum values (Ghozali, 2016). Two-panel data regression models are used in this study to test the hypotheses, namely the multiple regression panel data model and the moderated regression panel data model:

risk standard is $80\% < FDR < 110\%$. Indonesian ICBs are categorized as healthy banks. In addition, the standard deviation of $FDR = 0.189764 < \text{Mean } FDR = 0.842978$ shows that the FDR variation is relatively small.

3. The financing risk (NPF) of Indonesian ICBs is 0.036557 (3.66%). According to Indonesian OJK regulations, a healthy bank's financing risk standard is $NPF < 5\%$. It shows that, judging from its financing risk, Indonesia's ICB is categorized as a healthy bank. However, the standard deviation of $NPF = 0.034811 > \text{Mean } NPF = 0.036557$ indicates that the variation of NPF among Indonesian ICBs is considerable, where the largest NPF is 22.1%, and the smallest NPF is 0.32%.

4. The operational risk (OER) of Indonesian ICBs shows an average of 0.942730 (94.27%) when compared to the standard operational risk of the banking industry, which is categorized as healthy banks is $85\% \leq OER \leq 94\%$. Judging from its operational risk, Indonesian ICBs are generally categorized as healthy banks. The standard deviation of $OER = 0.276656 < \text{Mean } OER = 0.942730$ shows that the variation in operational risk among Indonesian ICBs is relatively small.

5. The bank size ($SIZE$) of Indonesian ICBs shows the standard deviation of $SIZE = 1.049801 < \text{Mean } SIZE = 29.83549$, indicating that the variation in bank size among Indonesian ICBs is relatively small.

Table 3. Descriptive statistical variables

Variables	Descriptive statistics			
	Mean	Maximum	Minimum	Standard deviation
ROA	0.012593	0.135800	-0.101000	0.037427
FDR	0.842978	1.967300	0.384900	0.189764
NPF	0.036557	0.221400	0.003200	0.034811
OER	0.942730	2.174000	0.575500	0.276656
SIZE	29.83549	32.03420	27.41450	1.049801

4.2. Hypotheses testing results

4.2.1. The results of independent hypotheses testing

Determining the appropriate regression panel data model for hypothesis testing the effect of financial risk on the financial performance of Indonesian ICBs is very important. To obtain a regression panel data model that is feasible for the independent hypothesis testing concerning the effects of FDR , NPF , and OER on the ROA of Indonesia ICBs, the approach of the common-effect model, fixed effects model, and random effect model were used. The estimation results of the feasibility of

the regression panel data model are presented in Table 5. Referring to Table 5, the fixed effects model is suitable for hypothesis testing because the independent variables can explain the dependent variable by 96%, which is the highest compared to other models. Furthermore, the model is tested with the Chow test and Hausman test to ensure that the regression panel data fixed effects model is the most appropriate for testing hypotheses based on data characteristics.

The results of testing the model using the Chow and Hausman tests are presented in Table 5.

Table 4. Estimation results of regression panel data model

Estimation test	Adjusted R-squared	Results
Common effects model	0.665502	Independent variables can explain the dependent variable by 66%, and other variables explain the remaining 34%.
Fixed effects model	0.968847	Independent variables can explain the dependent variable by 96%, and other variables explain the remaining 4%.
Random effects model	0.860683	Independent variables can explain the dependent variable by 86%, and other variables explain the remaining 14%.

Table 5. Chow and Hausman tests

Chow test			
Effect test	Statistics	DF	Prob.
Cross-section F-statistic	46.440985	(12.44)	0.0000
Cross-section Chi-squared	156.893444	12	0.0000
Test result: H ₀ : Command effect model; H ₁ : Fixed effects model. Prob. 0.0000 < α = 0.05, the most appropriate multiple regression panel data model for testing the independent hypotheses is the fixed effects model.			
Hausman test			
Test summary	Chi-squared statistics	DF Chi-squared	Prob.
Cross-section random	7.847454	3	0.0493
Test result: H ₀ : Random effects model; H ₁ : Fixed effects model. Prob. 0.0000 < α = 0.05, the most appropriate multiple regression panel data model for testing the hypothesis independence is the fixed effects model.			

Referring to Table 5, all models were tested using the Chow test and the Hausman test, it is known that the multiple regression panel data model, suitable for testing the independent hypothesis of the effect of financial risk on financial performance

at Indonesian ICBs, is a fixed effects model. Then, the results of the independent hypothesis testing of the effect of financial risk, including *FDR*, *NPF*, and *OER* on the *ROA* of Indonesian ICBs using the fixed effects model are presented in the table as follows.

Table 6. The results of independent hypothesis testing

Variables	Coefficients	Std. error	T-statistic	Prob.
Constant	0.089555	0.006740	13.28721	0.0000
<i>FDR</i>	-0.001562	0.005936	-0.263109	0.7937
<i>NPF</i>	-0.161573	0.036624	-4.411611	0.0001
<i>OER</i>	-0.073976	0.004787	-15.45442	0.0000
Effects specification				
Cross-section fixed (Dummy variables)				
R-squared	0.976767	Mean dependent variable		0.012593
Adjusted R-squared	0.968847	S.D. dependent variable		0.037427
S.E. of regression	0.006606	Akaike info criterion		-6.978529
Sum of squared residuals	0.001920	Schwarz criterion		-6.420037
Log-likelihood	225.3559	Hannan-Quinn criterion		-6.760072
F-statistic	123.3262	Durbin-Watson statistic		2.594497
Prob. (F-statistic)	0.000000			

Referring to Table 7, the derived multiple regression equation to test the hypothesis examines

the independent influence of *FDR*, *NPF*, and *OER* on the *ROA* within Indonesian ICBs, as presented below:

$$ROA = 0.089555 - 0.001562FDR - 0.161573NPF - 0.073976OER + \varepsilon \quad (3)$$

Based on the multiple regression equation mentioned above, the results obtained from testing the hypothesis regarding the effect of financial risk

(liquidity risk, financing risk, and operational risk) on financial performance in Indonesian ICBs are presented in Table 7 as follows.

Table 7. Summary of independent hypothesis testing

Hypotheses	Coefficients	Prob.	Conclusion
H1: Liquidity risk (<i>FDR</i>) has a significant positive impact on the financial performance (<i>ROA</i>) of Indonesian ICBs.	-0.001562	0.7937	Rejected
H2: Financing risk (<i>NPF</i>) has a significant negative impact on the financial performance (<i>ROA</i>) of Indonesian ICBs.	-0.161573	0.0001	Accepted
H3: Operational risk (<i>FDR</i>) significantly negatively impacts the financial performance (<i>ROA</i>) of Indonesian ICBs.	-0.73976	0.0000	Accepted

4.2.2. The results of moderation hypothesis testing

In addition to examining the effect of financial risk on financial performance, this study also presents a variable bank size (*SIZE*) as a moderator of the effect of financial risk on financial performance. Then, to get the most appropriate moderated

regression panel data model to test the bank size as a moderator of the effect of financial risk on the financial performance of Indonesian ICBs, the Chow and Hausman tests and Langrage multiplier (LM) were used. The results of this testing are presented in Table 8.

Table 8. Moderated regression panel data model fitness test

Chow test			
Effect test	Statistics	DF	Prob.
Cross-section F-statistic	47.831434	(12.44)	0.0000
Cross-section Chi-squared	158.535716	12	0.0000
<i>Test result:</i> <i>H₀</i> : Command effects model; <i>H₁</i> : Fixed effects model. Prob. 0.0000 < α = 0.05, the most suitable multiple regression panel data model for testing the independent hypothesis is the fixed effects model.			
Hausman test			
Test summary	Chi-squared statistics	DF Chi-squared	Prob.
Cross-section random	6.861540	3	0.0764
<i>Test result:</i> <i>H₀</i> : Random effects model; <i>H₁</i> : Fixed effects model. Prob. 0.0000 < α = 0.05, the most suitable multiple regression panel data model for testing independent hypothesis is the random effects model.			
LM test			
	Cross-section	Time	Both
Breusch-Pagan	75.405704	0.931219	76.38826
	(0.0000)	(0.3345)	(0.000)
<i>Test result:</i> <i>H₀</i> : Random effects model; <i>H₁</i> : Fixed effects model. The probability value of the Breusch-Pagan cross-section is 0.0000 < α = 0.05, the most suitable multiple regression panel data model for testing moderation hypothesis is the fixed effects model.			

Referring to Table 8, the moderated regression panel data model, which is suitable for testing the moderation hypothesis of bank size of the effect of financial risk on the financial performance of Indonesian ICBs, is the fixed effects model. Then,

the results of testing the moderation hypothesis showed the bank reduced the effects of financial risk, including *FDR*, *NPF*, and *OER* on the *ROA* of Indonesian ICBs using the fixed effects model are presented in Table 9 as follows.

Table 9. The results of moderated hypothesis testing

Variables	Coefficients	Std. error	T-statistics	Prob.
Constant	0.090229	0.008475	10.64599	0.0000
<i>FDR SIZE</i>	-9.85E-06	0.000198	-0.049849	0.9604
<i>NPF SIZE</i>	-0.005616	0.001220	-4.602622	0.0000
<i>OER SIZE</i>	-0.002552	0.000159	-16.07069	0.0000
Effects specification				
			S.D.	Rho
Cross-section random			0.019060	0.8956
Idiosyncratic random			0.006507	0.1044
Weighted statistics				
R-squared	0.873005	Mean dependent variable		0.001977
Adjusted R-squared	0.866201	S.D. dependent variable		0.018328
S.E. of regression	0.006704	Sum of squared residuals		0.002517
F-statistic	128.3202	Durbin-Watson statistic		1.958681
Prob. (F-statistic)	0.000000			
Unweighted statistics				
R-squared	0.633740	Mean dependent variable		0.012593
Sum of squared residuals	0.030270	Durbin-Watson statistic		0.162846

Based on Table 9, the moderated regression panel data equation is obtained with the formulation as follows in Eq. (4). Then, hypothesis testing results

of bank size as a moderator of the effects of financial risks on the financial performance of Indonesian ICBs is presented in Table 10.

$$ROA = 0.090229 - 9.85E - 06FDR * SIZE - 0.005616NPF * SIZE - 0.002552OER * SIZE + \epsilon \tag{4}$$

Table 10. Summary of moderated hypothesis testing

Hypothesis	Coefficient	Prob.	Conclusion
<i>H4</i> : Bank size reduces a significant positive impact of liquidity risk (<i>FDR</i>) on the financial performance (<i>ROA</i>) of Indonesian ICBs.	-0.985E-06	0.9604	Rejected
<i>H5</i> : Bank size reduces a significant negative impact of financing risk (<i>NPF</i>) on the financial performance (<i>ROA</i>) of Indonesian ICBs.	-0.005616	0.0000	Accepted
<i>H6</i> : Bank size reduces a significant negative impact of operational efficiency risk (<i>OER</i>) on the financial performance (<i>ROA</i>) of Indonesian ICBs.	-0.002552	0.0000	Accepted

4.3. Discussion

In the discussion section of this study, the focus centers on outlining and evaluating how financial risks — comprising *FDR*, *NPF*, and *OER* — impact the *ROA* of Indonesian ICBs. Additionally, the subsection delves into the examination and interpretation of the role played by bank size as a moderator, shaping how *FDR*, *NPF*, and *OER* collectively influence the *ROA* of Indonesian ICBs.

4.3.1. The impact of liquidity risk on financial performance

The results of this study state that the first hypothesis (*H1*) was rejected. The results of this study contrast with several recent studies that state that *FDR* has a significant positive effect on the *ROA* of Islamic banks (Agustin & Darmawan, 2018; Darma & Afandi, 2021; Pujiyanty et al., 2022).

Based on the results of the descriptive statistical analysis, it is known that the average (mean) value of liquidity risk in Indonesian ICBs is $FDR = 0.842978$ (84.29%), still included in the category of standard liquidity risk for healthy banks $80\% \leq FDR \leq 100\%$. However, *FDR* has no significant positive effect on the *ROA* of Indonesian ICBs. The results of this study contradict the findings of Reyad et al. (2022), who state that if liquidity risk is under the regulation of healthy bank liquidity standards, the financial performance of Islamic banks is higher.

The results of this study show that the mean *FDR* in Indonesian ICBs is 84.29%. This indicates that funds collected from third parties (public savings) have yet to be channeled optimally into financing to improve their financial performance. This study's findings differ from the results of Zeineb and Mensi (2018) who state that good corporate governance in Islamic banking tends to encourage executive managers to take significant liquidity risks to improve their financial performance. It was explained that the greater the third-party funds invested in financing would indeed increase liquidity risk. However, if the financing risk can be appropriately managed, Islamic banks' financial performance will increase. The results of this study indicate that financing risk in Indonesian ICBs cannot be adequately managed.

4.3.2. The impact of financing risk on financial performance

Financing risk is the most critical management risk in Islamic and conventional banking (Rinawati & Santoso, 2019; Darma & Afandi, 2021). The results of this study stated that *NPF* had a significant negative impact on the *ROA* of Indonesian ICBs, so the second hypothesis (*H2*) proposed in this study was accepted. The results of this study are in line with several recent studies which state that financing risk has a significant adverse effect on the financial performance of Islamic banks (Agustin & Darmawan, 2018; Darma & Afandi, 2021; Dasari & Wirman, 2020; Santoso et al., 2023).

The descriptive statistical analysis shows that the mean financing risk (*NPF*) for Indonesian ICBs is $NPF = 0.036557$ (3.66%). According to Indonesia OJK Regulation No. 8/POJK.03/2014, the *NPF* standard

for healthy banks is $NPF \leq 5\%$. Judging from the magnitude of the financing risk on ICBs in Indonesia in the 2017–2021 period, $NPF = 3.66\%$, *NPF* standard of the healthy bank industry is $NPF \leq 5\%$, this result of the study stated that the Indonesian ICBs are included in the healthy bank category.

4.3.3. The impact of operational risk on financial performance

Operational risk entails the potential for financial loss arising from deficiencies in internal processes, leading to system failures, human errors, and external occurrences that adversely influence bank operations. The present research affirms that *OER* indeed exerts a noteworthy and adverse impact on the *ROA* of the Indonesian ICBs, consequently corroborating the acceptance of the third hypothesis (*H3*) posited within this study. The results of this study support recent research which states that operational risk has a negative effect on the financial performance of Islamic banks (Agustin & Darmawan, 2018; Darma & Afandi, 2021; Fatmawati & Hakim, 2020; Hanafia & Karim, 2020).

Referring to the descriptive statistical analysis results, Indonesian ICBs have an *OER* of 0.942730 (94.27%). According to standard operating risk regulations for the banking industry, it is categorized as a healthy bank with an operational risk of $85\% \leq OER \leq 94\%$ (OJK Regulation No. 8/POJK.03/2014). The results of this study indicate that Indonesian ICBs are in the healthy bank category because their *OER* is 0.27% greater than the industry standard *OER* of a bank that is truly categorized as a healthy bank. Agustin and Darmawan (2018) stated that the greater the operational risk, the more inefficient the bank is because the operational costs are more significant than the operating income.

Islamic banks have different characteristics of assets and liabilities compared to conventional banks, so the operational risks faced by Islamic banks are also different from conventional banks (Aldoseri & Worthington, 2016). Islamic banks are more susceptible to operational risks and risks of non-compliant Sharia, while conventional banks are more vulnerable to credit risk and bankruptcy risk (Elgharabawy, 2020). Facing operational risks requires Islamic banks to manage costs efficiently and cost benefits to generate income. However, considering that the level of operational risk in Indonesian ICBs is $OER = 94.27\%$, which is still relatively higher than the standard operational risk in the banking industry, which is categorized as a healthy bank, which is $85\% \leq OER \leq 94\%$, it is recommended that operational risk management in Indonesian ICBs be carried more effectively and efficiently so that operational costs are utilized optimally to obtain maximum income within the framework of improving its financial performance.

4.3.4. Bank size as moderator of the effect of financial risk on financial performance

Bank size (*SIZE*), in this study, is measured by the amount of financing, either through a profit-sharing-based financing mechanism with *mudharabah* and *musyarakah* contracts, a sales-

based financing mechanism with *murabahah* and *istishna* contracts, a financing mechanism based on lease with *ijarah* contract, as well as a non-commercial financing mechanism with *al-qard* contracts. The type of financing mechanism carries unique characteristics of FDR, NPF, and OER and their effects on ROA among Indonesian ICBs.

The results of testing the moderation hypotheses proposed in the fourth hypothesis (*H4*), that bank size reduces the negative effect of *FDR* on the *ROA* of Indonesian ICBs, is rejected. It shows that bank size depends on total financing and cannot reduce the negative impact of liquidity risk on financial performance. The findings of this study reveal that, regardless of their scale, both large and small Islamic banks do not demonstrate a substantial influence of bank size on either financial risk or financial performance. Therefore, the ability of Indonesian ICBs to manage and control liquidity risk needs to be improved by prioritizing third-party funds to be invested in profitable financing to improve their financial performance.

Then, related to the fifth hypothesis (*H5*), bank size reduces the negative effect of financial risk (*NPF*) on the *ROA* of Indonesian ICBs, which is accepted. The results of this study support recent research, which states that increasing the amount of financing carried out by Islamic banks is followed by appropriate, effective, and efficient financing risk management to improve their financial performance. It shows that ICBs Indonesia's financing risk management has been carried out optimally by considering the size of their financing and the type of risk in each financing mechanism, namely through *mudharabah* and *musyarakah* (profit sharing financing), *murabahah* and *istishna* (sales financing), *ijarah* (lease financing), *al-qard* (non-commercial financing), and other appropriate and profitable financing mechanisms to improve its financial performance. Based on the theory of economies scale (McGee, 2015), the results of this study indicate that financing risk management at Indonesia ICBs has been supported by innovative fintech, which makes it possible to oversee and decide on the determination and implementation of profitable financing mechanisms, and to eliminate problematic financing, such as non-current financing, doubtful financing, and bad financing, to improve its financial performance.

Finally, regarding the sixth hypothesis (*H6*), bank size reduces the negative impact of *NPF* on the *ROA* of Indonesian ICBs, which is accepted. The results of this study support recent research which states that Islamic banks in Indonesia have developed innovative fintech in providing banking products and services, such as digital banking services (Riza, 2019). Based on the theory of economies of scale (McGee, 2015), the results of this

study indicate that innovative financial technology developed in providing banking products and services at Indonesian ICBs has succeeded in supporting operational risk management in a proper, effective, and efficient manner. Large and even small-scale ICBs can utilize operational costs more efficiently to obtain optimal operating income. It is recommended that future researchers examine and analyze the extent to which fintech supports the implementation of risk management of Indonesian Islamic banks to improve their performance, both financial performance and Islamic performance.

5. CONCLUSION

This study examined the impact of financial risk on the financial performance of Indonesian ICBs with bank size as a moderator. The research findings stated that liquidity risk does not significantly impact the financial performance of ICBs. In contrast, financing risk and operational risk have a significant negative impact on their financial performance. Furthermore, the study reveals that bank size does not reduce the negative impact of liquidity risk on financial performance. However, it mitigates the negative impact of financing and operational risks on financial performance. The results suggest that effective management and control of financing risk and operational risk, along with considerations of bank size, can enhance the financial performance of Indonesian ICBs. The findings contribute to a better understanding of the relationship between financial risk, bank size, and financial performance in Islamic banking. Future research could broaden the scope to include a broader range of Islamic banking institutions and more extended observation periods to gain a more comprehensive understanding.

This study is subject to certain limitations. The data source is confined to the annual reports of Islamic banks in Indonesia, potentially introducing constraints on the information's accuracy and comprehensiveness. The study's timeframe is restricted to the most recent five years, which may limit a comprehensive understanding of long-term trends and the evolving impacts that may unfold over a more extended period. Despite considering financial risk variables and bank size, other factors, such as macroeconomic variables, regulatory changes, and market dynamics could exert unexplored influences. The research findings might have limitations regarding their applicability for broader generalizations, especially in an international context or within the framework of Islamic banks in other countries.

REFERENCES

1. Agustin, P. T., & Darmawan, A. (2018). Pengaruh rasio keuangan terhadap kinerja keuangan bank Syariah (Studi pada bank umum Syariah yang Terdaftar di Otoritas Jasa Keuangan Republik Indonesia tahun 2014-2016). *Jurnal Administrasi Bisnis*, 64(1), 102-108. <http://administrasibisnis.studentjournal.ub.ac.id/index.php/jab/article/view/2731>
2. Aladwan, M. S. (2015). The impact of bank size on profitability: An empirical study on listed Jordanian commercial banks. *European Scientific Journal*, 11(34), 1857-7881. <https://eujournal.org/index.php/esj/article/view/6729>
3. Aldoseri, M., & Worthington, A. C. (2016). Risk management in emerging markets risk management in Islamic banking: An emerging market imperative. In S. Boubaker, B. Buchanan, & D. K. Nguyen (Eds.), *Risk management in emerging markets* (pp. 229-252). Emerald Group Publishing Limited. <https://doi.org/10.1108/978-1-78635-452-520161020>

4. AlFadhli, M. S., & AlAli, M. S. (2021). The effect of bank size on financial performance: A case study on Kuwaiti banks. *Journal of Insurance and Financial Management*, 4(3), 11-15. https://www.researchgate.net/publication/352092630_The_Effect_of_Bank_Size_on_Financial_Performance_A_Case_Study_on_Kuwaiti_Banks
5. Anindyastri, R., Lestari, W. D., & Sholahuddin, M. (2022). The influence of financial technology (fintech) on the financial performance of Islamic banking (Study on Islamic banking listed on the Indonesia Stock Exchange period 2016-2020). *Benefit: Jurnal Manajemen dan Bisnis*, 7(1), 80-92. <https://doi.org/10.23917/benefit.v7i1.18051>
6. Ardana, Y. (2018). Faktor eksternal dan internal yang mempengaruhi profitabilitas bank Syariah di Indonesia. *Cakrawala*, 13(1), Article 51. <https://doi.org/10.31603/cakrawala.v13i1.2042>
7. Ardichy, M. F., & Rahayu, Y. S. (2022). Pengaruh rasio keuangan terhadap profitabilitas pada bank umum Syariah di Indonesia periode 2017-2021. *Owner: Riset Dan Jurnal Akuntansi*, 6(3), 1432-1445. <https://doi.org/10.33395/owner.v6i3.924>
8. Ateeq, A., Alqemzi, M., Aziz, N. A. A., Yahaya, S. N., & Husseini, S. A. (2021). The impact of liquidity risk management on financial performance through profitability in the UAE Islamic banks: A review. *Journal of Positive School Psychology*, 6(3), 4636-4645. <https://www.journalppw.com/index.php/jpsp/article/view/2664>
9. Darma, E. S., & Afandi, A. (2021). The role of Islamic corporate governance and risk toward Islamic banking performance: Evidence from Indonesia. *Journal of Accounting and Investment*, 22(3), 517-538. <https://doi.org/10.18196/jai.v22i3.12339>
10. Dasari, S. A., & Wirman, W. (2020). Pengaruh dana pihak ketiga dan non performing financing terhadap return on asset bank umum Syariah di Indonesia (Periode 2014-2019). *Jurnal Nisbah*, 6(2), 124-130. <https://doi.org/10.30997/jn.v6i2.3164>
11. Dewi, F. K., & Sudarsono, H. (2021). Analisis profitabilitas bank Syariah di Indonesia: Pendekatan autotoregressive distributed lag (ARDL). *Al-Mashrafiyah: Jurnal Ekonomi, Keuangan, Dan Perbankan Syariah*, 5(1), 59-74. <https://doi.org/10.24252/al-mashrafiyah.v5i1.20281>
12. Elgharbawy, A. (2020). Risk and risk management practices: A comparative study between Islamic and conventional banks in Qatar. *Journal of Islamic Accounting and Business Research*, 11(8), 1555-1581. <https://doi.org/10.1108/JIABR-06-2018-0080>
13. Estiawan, A. B., & Asrori. (2021). The determinants of non-performing financing (NPF) in Islamic commercial banks in Indonesia. *Accounting Analysis Journal*, 10(3), 213-219. <https://journal.unnes.ac.id/sju/index.php/aaj/article/view/53768>
14. Falikhhatun, & Mutiarafah. (2021). The impact of risk and reputation on financial performance in Islamic banking: Evidence from Indonesia. *Amwaluna: Jurnal Ekonomi dan Keuangan Syariah*, 5(2), 230-243. <https://ejournal.unisba.ac.id/index.php/amwaluna/article/view/7033>
15. Fatmawati, N. L., & Hakim, A. (2020). Analisis tingkat profitabilitas perbankan Syariah di Indonesia. *Jurnal Baabu Al-Ilmi*, 5(1), 1-15. <https://doi.org/10.29300/ba.v5i1.3115>
16. Ghozali, I. (2016). *Aplikasi analisis multivariate dengan program IBM SPSS 21* (8th ed.). Badan Penerbit Universitas Diponegoro.
17. Hanafia, F., & Karim, A. (2020). Analisis CAR, BOPO, NPF, FDR, NOM, dan DPK terhadap profitabilitas (ROA) pada Bank Syariah di Indonesia. *Target: Jurnal Manajemen Bisnis*, 2(1), 36-46. <https://doi.org/10.30812/target.v2i1.697>
18. Hosen, M., Muhari, S., & Costner Kardius, K. (2021). The effects of productivity and liquidity on the profitability of Islamic banks in Indonesia. *Al-Iqtishad: Jurnal Ilmu Ekonomi Syariah*, 13(2), 411-430. <https://doi.org/10.15408/aiq.v13i2.22585>
19. Leong, W. H., & Dollery, B. (2004). The productive efficiency of Singapore banks: An application and extension of the Barr *et al.* (1999) approach. *Singapore Economic Review*, 49(2), 273-290. <https://doi.org/10.1142/S0217590804000925>
20. Mardiana. (2018). Pengaruh manajemen risiko terhadap kinerja keuangan (Study pada perbankan Syariah yang Terdaftar di BEI). *Iqtishoduna*, 14(2), 151-166. https://www.researchgate.net/publication/328609995_PENGARUH_MANAJEMEN_RISIKO_TERHADAP_KINERJA_KEUANGAN_STUDY_PADA_PERBANKAN_SYARIAH YANG TERDAFTAR DI BEI
21. McGee, J. (2015). Economies of scale. In J. McGee & T. Sammut-Bonnici (Eds.), *Wiley encyclopedia of management* (pp. 1-6). John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118785317.wcom120226>
22. Nurwulandari, A., Hasanudin, H., Subiyanto, B., & Pratiwi, Y. C. (2022). Risk based bank rating and financial performance of Indonesian commercial banks with GCG as intervening variable. *Cogent Economics & Finance*, 10(1), Article 2127486. <https://doi.org/10.1080/23322039.2022.2127486>
23. Otoritas Jasa Keuangan (OJK). (2022). *Sharia banking statistics*. <https://www.ojk.go.id/en/kanal/perbankan/data-dan-statistik/statistik-perbankan-syariah/Default.aspx>
24. Prasaja, M. (2018). Determinan kinerja keuangan perbankan Syariah. *Kinerja: Jurnal Ekonomi dan Manajemen*, 15(2), 57-67. <http://journal.feb.unmul.ac.id/index.php/KINERJA>
25. Pujiyanty, L., Puspita, R. E., & Mochlasin, M. (2022). Measuring the role of non-performing financing in boosting profitability of Islamic commercial banks. *El Dinar*, 10(1), 1-15. <https://ejournal.uin-malang.ac.id/index.php/eldinar/article/view/12955>
26. Reyad, S., Chinnasamy, G., & Madbouly, A. (2022). Risk management and corporate governance of Islamic banks: Evidence from GCC countries. *Corporate Governance*, 22(7), 1425-1443. <https://doi.org/10.1108/CG-08-2020-0360>
27. Rinawati, T., & Santoso, A. (2019). The comparative study of Islamic and conventional bank in Indonesia. *Kodifikasia*, 13(2), 353-367. <https://doi.org/10.21154/kodifikasia.v13i2.1772>
28. Riyadi, S. C., Choiron, F., & Prayogo, E. R. (2022). Pengaruh faktor permodalan dan risiko likuiditas terhadap profitabilitas yang dimediasi risiko pembiayaan pada bank Syariah. *AKUA: Jurnal Akuntansi Dan Keuangan*, 1(2), 226-232. <https://doi.org/10.54259/akua.v1i2.788>
29. Riza, A. F. (2019). Customer acceptance of digital banking in Islamic bank: Study on millennial generation. *CIMAE*, 2, 66-74. <https://journal.uui.ac.id/CIMAE/article/view/13351>
30. Rustam, B. R. (2018). *Manajemen risiko perbankan syariah di era digital: Konsep dan penerapan di Indonesia* (2nd ed.). Salemba Empat.

31. Saiful, S., & Ayu, D. P. (2019). Risks management and bank performance: The empirical evidences from Indonesian conventional and Islamic banks. *International Journal of Economics and Financial Issues*, 9(4), 90-94. <https://doi.org/10.32479/ijefi.8078>
32. Santoso, A. (2020). Detect determinants of profitability performance of Sharia bank. *Relevance*, 3(1), 39-48. <https://doi.org/10.22515/relevance.v3i1.2329>
33. Santoso, A. L., Kamarudin, F., Amin Noordin, B. A., & Wei Theng, L. (2023). Islamic ethics commitment and bank outcomes: Evidence in South East Asia. *Cogent Economics and Finance*, 11(1), Article 2175458. <https://doi.org/10.1080/23322039.2023.2175458>
34. The Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI). (2015). *Sharia'ah standards*. <https://aaoifi.com/shariaa-standards/?lang=en>
35. Ubaidillah, & Astuti, T. P. (2020). Analysis of financial performance of Islamic banks using the Sharia conformity and profitability (SCnP). *Jurnal Penelitian Keuangan Dan Perbankan Syariah*, 2(2), 134-158. <https://media.neliti.com/media/publications/338717-analisis-kinerja-keuangan-bank-syariah-m-53a7ce59.pdf>
36. Zeineb, B. G., & Mensi, S. (2018). Corporate governance, risk and efficiency: Evidence from GCC Islamic banks. *Managerial Finance*, 44(5), 551-569. <https://doi.org/10.1108/MF-05-2017-0186>