

Siswanti, Indra; Riyadh, Hosam Alden; Cahaya, Yohanes Ferry; Putra, Yananto  
Mihadi; Beshr, Baligh Ali Hasan

## Article

# Unveiling the dynamics of the business sustainability model: a holistic analysis of financial and digital transformation

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# Unveiling the dynamics of the business sustainability model: a holistic analysis of financial and digital transformation

Indra Siswanti<sup>a</sup> , Hosam Alden Riyadh<sup>b,c</sup> , Yohanes Ferry Cahaya<sup>d</sup>, Yananto Mihadi Putra<sup>e</sup> and Baligh Ali Hasan Beshr<sup>c</sup> 

<sup>a</sup>Department of Economics and Business, Universitas Mercu Buana, Jakarta, Indonesia; <sup>b</sup>School of Economics and Business, Telkom University, Bandung, Indonesia; <sup>c</sup>Department of Administrative Sciences, College of Administrative and Financial Science, Gulf University, Sanad, Bahrain; <sup>d</sup>Department of Management, Faculty of Economics and Business, Perbanas Institute, Indonesia; <sup>e</sup>Department of Accounting, Universitas Mercu Buana, Jakarta, Indonesia

## ABSTRACT

The paper introduces a new model that reveals multifaceted financial factors impacting the sustainability of Islamic rural banks, including financing quality, capital quality, financial performance, and digital transformation. Among these, several financial-influencing aspects are associated with business sustainability. The research objectives, thus, are to investigate, first, the impact of financing quality and the quality of capital on business sustainability; second, the impact of financing quality and the quality of capital on financial performance; third, financial performance in mediating the effect of financing quality and capital quality on business sustainability; and fourth, digital transformation in moderating the effect of financial performance on business sustainability. The study employed quantitative research methods, utilizing data from 164 Islamic rural banks' financial and annual reports for the 2016–2021 period. The authors then conducted the analysis using partial least squares (PLS). The research findings unveiled that financing and capital quality exerted an impact on sustainable businesses. Furthermore, financing and capital quality had a significant impact on Islamic rural banks' financial performance. The study also uncovered that financial performance completely mediated the impact of financing quality on the sustainability of Islamic rural banks. On the other hand, financial performance was partially showcased to mediate the impact of capital quality on a business's sustainability. In addition, digital transformation moderated the effect of financial performance on the sustainability business of Islamic rural banks.

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G21; G32

## 1. Introduction

One of the largest Muslim populations in the world is known to reside in Indonesia, and it is no surprise that Islamic banking is a great opportunity for growth. In this respect, the Indonesian Islamic banking market is one of the most promising and has the potential to grow significantly. Nevertheless, the data indicates that the market share of Islamic rural banking institutions has not yet surpassed 10%. In addition to its negligible market share, the market share of the Islamic rural bank will also have a significant impact on the sustainability business of Islamic rural banks in Indonesia. Therefore, according to Indonesia's Financial Services Authority, from January to June 2022, there was a total of 164 Islamic rural banks in the whole of Indonesia, while the number of conventional rural banks for the same period was recorded at 1453 banks. As a result, Islamic rural banks were 11.29% compared to the total number of conventional rural banks. As a matter of fact, Indonesia, with a population of 222 million Muslims, is the largest Muslim nation in the world. With this large Muslim population, the presence of Islamic rural banks is likely to increase. It is thus expected that the existence of several Islamic rural banks can become the basis of the local economy.

**CONTACT** Indra Siswanti  [indra.siswanti@mercubuana.ac.id](mailto:indra.siswanti@mercubuana.ac.id)  Department of Economics and Business, Universitas Mercu Buana, Jakarta, Indonesia

Present affiliation of Yohanes Ferry Cahaya: Universitas Dirgantara Marsekal Suryadarma, Jakarta, Indonesia.

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Additionally, according to Elkington (1998), 'a sustainable company must pay attention to the 3P concept, such as profit, people, and the planet, to achieve business sustainability'. Islamic banks' sustainable operational activities are not exclusively focused on profits; instead, they include elements of people and the environment into their everyday operations in accordance with the previously stated 3P principles. Every component of the planet—people and profit—has the same importance. For example, if a business pays close attention to social conditions, society will pay even better attention to the environment. Moreover, the causal relationships influencing each other will ultimately impact the business's progress, development, and sustainability. The triple bottom line, or business sustainability, is the harmony of people, planet, and profit. Companies frequently prioritize maximizing profits and utilizing technology as effectively as possible, omitting environmental and social considerations.

Consequently, another factor that could potentially influence the development of Islamic rural banks in Indonesia is the need for more innovation in the types of goods and services offered by Islamic rural banks, including the use of suitable technology. Despite the possibility of rural banks holding a different market share compared to the overall banking market, a significant number of transactions still occur without the use of electronic devices. In this case, digital transformation involves the use of digital technologies such as cloud computing, big data, mobile computing, social computing, and analytics in an organization to make business operations efficient and improve the consumers' experience in the business. Furthermore, the process of digital transformation significantly influences the sustainability of a business as it shapes its environmental, social, and economic impact. However, organizations must prioritize this aspect, as consumers, shareholders, and other stakeholders can easily observe how business activities affect brand value, revenue, and company valuation (Robertson & Lapiņa, 2023). Digital transformation is also an important aspect to be prioritized, considering that the banking business also includes many Islamic rural banks. Hence, Islamic rural banks cannot also be separated from technology since today's society is already equipped with technology.

Aside from the previously described technological implementation, many non-bank financial institutions are competitors to bank financial institutions that are more aggressive and advanced in technology. In response to these significant changes, it is time for Islamic rural banks to continuously develop and offer various financial products and services through technology so that technology facilitates customers. These initiatives will undoubtedly impact the sustainability performance of Islamic rural banks. This condition follows the research results of Katsamakos (2022) and Oktavenus (2019), which state that digital transformation significantly influences the company's business sustainability.

Financial factors, in conjunction with the aforementioned elements, frequently assume critical importance in determining the sustainability of Islamic rural institutions. As is well known, Islamic rural banks' primary functions include collecting cash from the community and returning it in the form of financing. Here, Islamic rural banks must always ensure that there is a manageable amount of financing problems because this can disrupt their business continuity; therefore, the management of Islamic rural banks is necessary to maintain non-performing lending below 5%. Moreover, an earlier study result by Kurniawansyah and Mutmainah (2013) found that non-performing financing (NPF) significantly negatively affects sustainable business. However, Masrurroh and Mulazid (2017) findings exhibited different results, indicating that (NPF) does not impact the sustainability of Islamic commercial banks' business.

Another financial factor that is also essential for Islamic rural banks' sustainability business is the quality of capital, where the size of the capital will have an impact on the bank if problems occur, such as bad credit problems. Therefore, Islamic rural banks need to ensure that their capital adequacy ratio is fulfilled as stipulated in Bank Indonesia, claiming that CAR of at least 8% reflects the quality of capital. Maintaining the capital adequacy ratio (CAR) is crucial for sustaining the business of Islamic rural banks. The research results by Rahmi and Anggraini (2013) have identified that CAR significantly impacts the sustainability performance of Islamic banks. Nevertheless, Masrurroh and Mulazid (2017) identified a different result that the capital adequacy ratio (CAR) does not have an impact on the sustainability business of Islamic commercial banks.

On the other hand, non-performing financing (NPF), a measure of financing quality, will have a significant impact on profitability; in other words, the more valuable financing is, the less profitable it is. Husaeni (2017) conclusion that NPF has a significant negative impact on the financial health of Islamic rural banks also supports this case. Further corroborated by the research outcomes documented by

Khalifaturofi'ah and Nasution (2016) and Sumiati and Karmila (2016), the research results indicate that the financial performance is substantially impacted by the quality of its capital. Also, Sukmadewi (2020) and Karugu et al. (2018) acknowledged that CAR had a significant effect on financial performance.

In addition to the preceding, the financial stability of the banks is a key determinant of their business continuity, and their financial performance plays a vital role in determining the operational sustainability of the banks. It is undisputed that if Islamic rural banks' financial performance increases, sustainability businesses will remain viable. The research findings by Tobing et al. (2019) reflect this condition. Financial performance has a considerable beneficial effect on the sustainability of manufacturing enterprises' operations. It would seem that the financial performance of Islamic banks has a significant role in the long-term sustainability of their business.

However, notable gaps are present in the existing literature that this study aims to address, such as a limited understanding of financing quality in Islamic rural banks and a limited acknowledgment of the impact of digital transformation on the sustainability of Islamic rural banks, which is a significant issue. Furthermore, existing literature has not delved into a detailed exploration of what constitutes 'digital transformation' in the context of these banks. As such, there is a need for a comprehensive analysis of the various dimensions of financing quality, digital transformation, capital quality, compliance with Sharia principles, and the effectiveness of financing practices. For that reason, the purpose of this study is to investigate how financing quality, capital quality, and digital transformation affect the sustainability of Islamic rural banks in Indonesia. The study will provide a comprehensive overview of the research focused on the sustainability of Islamic rural banks in Indonesia, and it will address key factors such as financing quality, capital quality, financial performance, and digital transformation. Apart from shedding light on the mediation role of financial performance, it also introduces the moderating effect of digital transformation on the relationship between financial performance and the sustainability of Islamic rural banks. Moreover, related to the previously explained background problems, this research builds on research questions as follows:

1. Does financing quality and quality of capital affect the business sustainability of Islamic rural banks in Indonesia?
2. Does financing quality and quality of capital affect the financial performance of Islamic rural banks in Indonesia?
3. Does financial performance mediate the effect of financing quality and capital quality on the business sustainability of Islamic rural banks in Indonesia?
4. Does digital transformation moderate the effect of financial performance on the business sustainability of Islamic rural banks in Indonesia?

To answer the research questions and achieve the study's objectives, the researchers tested and analyzed the relationship between financing quality, capital quality, financial performance, and digital transformation for a business sustainability model. Therefore, the structure of this paper is as follows. First, the introduction discusses the primary objectives and motivation. Second, a theoretical literature review elucidates the basic theory. Third is the research methods. The fourth section provides empirical outcomes, and the fifth section presents a discussion. The last is the conclusion.

## 2. Literature review and hypotheses development

In 1994, the business world introduced the triple bottom line concept as a new framework for sustainability, aiming to integrate economic, social, and environmental considerations into corporate strategies. This concept provided guidance for industries to align with the Rio + 20 sustainable development goals (SDGs) and the 2015 Millennium Development Goals (MDGs). It encouraged firms to incorporate human and environmental security into their strategic business models, as well as to develop new tools and systems for assessing their impact on society and the environment (Griggs et al., 2013). Elkington (1998) encapsulates this approach with the 3Ps—people, planet, and profits as a threefold aim for sustainability in 21st-century business. His concept states that industries should examine the three sectors when formulating strategies since they are all equally significant, taking into consideration reasons other than

financial returns (Moneva et al., 2006). To achieve success in genuine triple-bottom-line development, a corporation must take into account the presence of all three factors, each yielding beneficial outcomes. As a result, companies are developing sustainable technologies to meet the demands of customers and other interested parties.

However, little is known regarding the necessary capabilities and whether these innovations generate the lauded benefits for society, the environment, and financial gain—or triple-bottom-line—rewards. According to Weidner et al. (2021), a study looks at market-based capabilities and stakeholder theories, as well as a survey of companies working on sustainable innovations. It then observed how market-based sustainability and organizational learning could assist in driving sustainable innovation, with the caveat that the government must own the company, and the employees must stop learning.

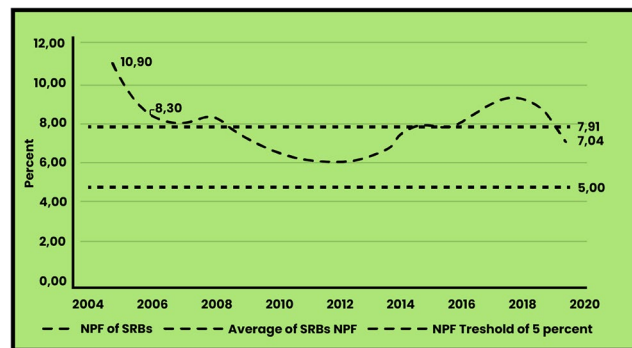
In addition, sustainable innovation has been shown to enhance organizations' environmental, social, and economic performance, hence contributing to the triple bottom line. Moreover, companies design their businesses with the goal of ensuring their sustained success. A business's sustainability not only focuses on earning profits but also considers economic, social, and environmental factors. According to Elkington's Elkington (1998) Triple Bottom Line Theory, or 3P Theory, the important aspects of sustainability assess a company's success using three criteria: profit (economic), people (social), and planet (environmental). This approach is known as the business sustainability concept. Thus, a sustainable firm integrates economic, social, and environmental factors into its business plan to accomplish long-term commercial goals and add value.

Further, companies must increasingly realize the importance of factors other than profit so that they can continue to be sustainable. Many factors affect business sustainability, both financial and non-financial. In this current research, financial factors were examined for their impact on business sustainability. Specifically, according to the Indonesian Accounting Association (Indonesia, 2007), non-performing financing is credit or financing for which payment of principal installments and/or interest or profit sharing has passed 90 days or more after maturity or credit or financing whose timely payments are very doubtful. Non-performing financing (NPF), which adheres to the Indonesian bank's rules that the maximum NPF is 5%, is a measure of the quality of financing in Islamic rural banks. Thus, all Islamic rural banks always maintain that the NPF does not exceed 5%. Moreover, suppose Islamic rural banks can control non-performing financing. In that case, this initiative can improve the performance of Islamic rural banks, ultimately increasing business sustainability in Indonesia. Moreover, on 13 December BI established PBI No. 3/21/PBI/2001 concerning obligations and the Minimum Capital Requirement (CAR) for banks.

In addition to the challenges posed by financial activities directed towards the community, there is also the issue of non-performing financing (Mishra et al., 2021). In Islamic finance banking, financing quality (NPFs) serves as an important indicator that reflects the quality of disbursed funds. When the value of NPFs is high, problematic funding situations often emerge (Chalid & Bella, 2021; Sudarsono & Ash Shiddiqi, 2022). The data suggests that Islamic banks and businesses in Indonesia can maintain a high standard of financing quality, as their average non-performing financing (NPF) remains below the 5% threshold. Nevertheless, this country has identified eight provinces with NPF values exceeding 5%. In 2019, financing quality improved in a total of 16 provinces. The NPF ratio's value decreased, reflecting this improvement. Within this framework, the gross NPF ratio stood at 2.90%, a decrease from the prior year's 2.15%. In 2019, the net NPFs stood at 1.89%, reflecting the impact of the loss reserve increment created by the Islamic commercial bank and business unit (Budiarto, 2021; Shala et al., 2018).

Figure 1 depicts the (OJK) financing quality issue of Indonesian Islamic rural banks, with an average NPF of 7.91% from 2005 to 2019. The NPFs were highest in 2005 (10.90%), lowest in 2011 (6.11%), and moderate in 2019 (7.04%). A high NPF caused bad financing quality because it exceeded the central bank's 5% guideline. Besides Islamic rural banks, conventional financial institutions have these activities (Sukmana et al., 2020). International economic risk grew after the 2008 financial crisis due to global uncertainty. This delayed corporate investment and expansion, slowing GDP growth and public purchasing power. However, Kurniawansyah and Mutmainah's (2013) research on the effect of financing quality on business sustainability comes to the conclusion that non-performing finance (NPF) has a big negative impact on the sustainability of business banking operations. According to the theory and research previously proposed, the hypothesis is as follows:





**Figure 1.** Number of Sharia People's financing banks in Indonesia.

Source: Islamic Banking Statistics, 2019.

*H1: The financing quality significantly negatively impacts the sustainability of Islamic rural banks' businesses in Indonesia.*

To conduct its functions properly, a bank must possess enough equity capital, maintain a portfolio of high-quality assets, manage decently, and operate on a prudent principle. The objective is to generate sufficient revenue to ensure the continuation of the business and maintain sufficient liquidity to enable the entity to meet its liabilities at any time. A capital adequacy ratio (CAR) is an appropriate measure of a bank's capital adequacy, and the CAR value is at least 8%. CAR position and indicates where the bank's operations are headed in the future. The higher the CAR, the more robust the bank will be in case of a decline in asset values caused by problem assets. With sufficient capital, the company's business can be sustainable (Umam & Sutanto, 2013).

In Indonesia, the Financial Services Authority (OJK) has issued OJK regulations regarding bad credit, which govern loans. OJK regulations are contained in OJK Regulation No. 35 of 2018 Article 92. This regulation classes credit fluency into five credit score categories that must be paid attention to when applying for a loan so that people do not get blocklisted. According to the OJK, credit collectability levels in banks are classified as follows. The first is the current category, which allows the borrower to pay the installments on time, within 10 calendar days. Second, DPK is a special category for borrowers who are 10 to 90 days late on their installment payments. The third category is substandard, which means the borrower is more than 90 days late but less than 120 days. Fourth, in the doubtful group, the borrower is more than 120 days late on installment payments but less than 180 days. The fifth loss category occurs when the borrower fails to make payments on time for more than 180 days.

Furthermore, according to Rahmi and Anggraini (2013) and Siswanti et al. (2024) research findings on the influence of capital quality on sustainability, CAR significantly improves the sustainability performance of Islamic banks. Based on the aforementioned theory and research, the following hypothesis is formulated:

*H2: The quality of capital positively and significantly impacts the sustainability of Islamic rural banks' businesses in Indonesia.*

Non-performing financing (NPF) reflects Islamic rural banks' financing quality. The NPF is a tool for evaluating funding. Regarding this important requirement, Islamic rural banks must sustain financing quality. This is because a high net profit can have a disadvantageous effect on performance. Furthermore, Sutrisno (2017) asserted that the nominal NPF, or the ratio of the number of NPFs, measures asset quality. If the customer fails to pay the obligations for more than 90 days of total financing, the loan will be categorized as NPF. Thus, it can be concluded that NPF is a form of financing whose quality is substandard, doubtful, and lost. In terms of performance, which refers to the bank's ability to generate income, the NPF has significantly decreased and is now non-existent. This NPF ratio is employed to evaluate the state of bank assets, taking into account the potential risk of non-payment of financing at the financing maturity date. As a result, managing NPF is critical for bank performance.

Accordingly, the study by Sukmadewi (2020) revealed that NPF significantly and negatively impacts bank financial performance. Furthermore, Permataningayu and Mahdaria (2019) indicated that

non-performing financing has a substantial influence on financial performance. In another study in Ghana, Korankye-Sakyi and Oluyeju (2022) uncovered that Ghana banks' financial performance was significantly impacted by non-performing loans. The following hypothesis is formulated in accordance with the theory and research that have been previously suggested:

*H3: The quality of financing has a significant positive effect on financial performance.*

The availability of capital is a fundamental element in the growth and profitability of a business. Apart from the fact that capital is vital for banks, especially during the COVID-19 pandemic, strengthening capital for banks is no longer an option but a necessity. The quality of capital is the main pulse for a bank, bearing in mind that when a crisis occurs, capital becomes the primary supporting tool for the continuity of the bank's business. In an earlier study by Sumiati and Karmila (2016), the quality of the capital, which is shown in the CAR, has a substantial effect on financial performance. However, the investigation by Sukmadewi (2020) identified that the CAR significantly impacts the financial performance of commercial banks in Indonesia. According to a study by Harahap and Effendi (2020), the CAR of Kenyan banks has a notable favorable impact on financial performance. Likewise, Albert and Olweny (2017) stated that capital adequacy positively and significantly impacts the commercial bank's financial performance in Nairobi. The following is the hypothesis based on the previously suggested theory and research:

*H4: Capital quality has a significant positive effect on financial performance.*

It tends to be the case that financial performance reflects the company's success. A decent financial performance will benefit stakeholders, and the Islamic rural bank business can be sustainable. A bank will function as a negotiator between the owners of extra funds and those who need financing. Almost all business sectors really need bank services, both business owners and not, apart from the bank's needs. The bank's importance has consequences. Thus, the bank's financial performance must always be decent. If the bank has less financial performance, it will directly impact channeling funds to parties needing funds, and vice versa. Therefore, Islamic rural banks must consistently maintain financial performance to sustain their business.

Conversely, Tobing et al. (2019) indicated that financial performance significantly impacts manufacturing companies' business sustainability. Siswanti et al. (2017) and Siswanti et al. (2022) also identified that financial performance positively impacts the sustainability of Islamic banks' businesses. The hypothesis can be expressed as follows in light of the previously suggested theory and research:

*H5: Financial performance has a significant positive effect on business sustainability.*

Sustainability is a broad notion that centers around an institution or company's ability to run continually and without interruption (Spodick, 2016). Sustainability encompasses numerous facets, including market sustainability, impact on the environment, sustainability regulation, sustainability policies, fiscal sustainability, organizational sustainability, and sustainable human resources (Dutta & Das, 2014). According to Marwa and Aziakpono (2015), long-term financial sustainability may be influenced indirectly by short-term financial sustainability. Moreover, Roy et al. (2015) stated that the financial industry is crucial in advancing sustainable development, and the findings of their research demonstrate a favorable reaction toward the enforcement of bank sustainability concerns under the supervision of the Central Bank.

Therefore, the primary income of banking companies is from financing; for this reason, banks are required to maintain their financing quality. The higher the financing that the bank distributes to the public, the greater the increase in the bank's revenue, which in turn will lead to an improvement in the business sustainability of the bank. Conversely, if the quality of the bank's funding cannot be preserved properly, this may have an impact on bank performance. In this case, it will have an impact on the decline in bank revenue, which in turn can disrupt the bank's business sustainability. Certainly, Siswanti et al. (2017) confirmed the same findings that financial performance may influence financial ratios' effect on the corporate sustainability of Islamic banks' financial performance. Based on the previously proposed theory and study, the following hypothesis is put forth:

*H6: Financial performance mediates the effect of financing quality on the business sustainability of Islamic rural banks in Indonesia.*



Capital adequacy is a key concern for banks, especially during the COVID-19 crisis. This condition occurs because, with sufficient capital, the bank will be able to be more vital in conducting its business operations. To maintain capital adequacy, banks employ various methods, such as making direct capital injections from controlling shareholders or temporarily refraining from distributing dividends. Furthermore, banks do this to ensure that they can maintain their performance by increasing profits and keeping their operations running and sustainable. The research results of Siswanti and Cahaya (2020) state that mediating financial performance could impact the financial ratios and the firm sustainability through financial performance. The hypothesis is the following, based on the previously proposed theory and research:

*H7: Financial performance mediates the effect of capital quality on the business sustainability of Islamic rural banks in Indonesia.*

Digital transformation in banking is a financial management effort using a digital ecosystem and the latest technology. Effective implementation of digital banking transformation will have an impact on increasing efficiency, reducing error rates, optimizing workforce allocation, and speeding up transaction processes; therefore, the digital transformation process in banking is a massive ongoing effort. To maintain the continuity of the banking business, Islamic rural banks are starting to adopt digital technology to improve services to consumers and financial performance, which will ultimately impact business continuity. Furthermore, Yanti et al. (2018) determined that the sustainability of microenterprises is substantially impacted by technological advancement and innovation. Similarly, Oláh et al. (2020) assert that Industry 4.0 has a profound impact on environmental sustainability. Furthermore, Rahmalia et al. (2024) utilized a sample that encompassed eight institutions in Malaysia and comprised twelve quarters prior to and twelve quarters following the study. Measures of earnings, capital adequacy, asset quality, and liquidity were captured. Outcomes indicated that E-mobile banking led to a significant change in LDR and CAR. Continuously, the banking sector in India has been able to sustain the pandemic impacts through policy interventions of the government and regulators and compliance with capital adequacy ratios. The banks have kept higher levels of capital, better liquidity standards, and lower leverage, which provide protection from pandemic shock. According to Fatima et al. (2024), the financial sector was highly transformed to digital during the COVID-19 pandemic surge. The researchers define what Basel norms are and how they operate. They also consider the capital-to-risk weighted assets ratio of Indian Scheduled Commercial Banks (SCBs) and how it evolved during the COVID-19 outbreak. The study also assessed the distribution of SCBs according to the CRAR and the capital ratios of the public, private, and foreign sector banks from 2016 to 2022. The output of the ANOVA analysis exhibited a significant difference in the CRAR of public, private, and foreign banks. Therefore, the study establishes that CAR levels are sufficient to enable banks to manage the risks that occur during pandemic crises and to facilitate banking operations. According to the theory and research given previously, the hypothesis is as follows:

*H8: Digital transformation moderates the effect of financial performance on the business sustainability of Islamic rural banks in Indonesia.*

Further discussing financing performance, according to the Indonesian Accounting Association (Indonesia, 2007), non-performing financing is credit/financing for which payment of principal installments and/or interest/profit sharing has passed 90 days or more after maturity or credit/financing whose timely payments are very doubtful. NPF is the term used to describe financing with a collectability level of substandard, doubtful, or bad. NPF is also an indicator of the strength of the bank's assets and the capability of financing and managing financial resources distributed to the public. Collectability of financing occurs due to customer discrepancies in paying principal installments and profit sharing (margin). One of the primary methods for evaluating the performance of a bank is to examine its financing capabilities. This is referred to as NPF. It can thus be concluded that a rise in unproductive funding will lead to a decrease in profitability, which will have an impact on reducing banks' ability to channel financing to the public.

The value of the NPF ratio shall not exceed 5%. The NPF ratio is calculated using the following formula:

$$\text{NPF} : (\text{Problematic Financing} / \text{Total Funding}) \times 100\%$$

The following discussion focuses on the quality of capital, where CAR measures the adequacy of a bank's capital to meet its requirements. CAR serves as a benchmark for evaluating the viability of a bank's operations. As is known, if the CAR-indicated value of a bank is high, the bank's ability to deal with depreciating asset values arising from troubled assets will be higher. According to Umam and Sutanto (2013), CAR is a measure of the capacity of bank capital that can be utilized as a reserve to forecast the likelihood of a loss. The capital adequacy ratio (CAR) is an indicator that measures a bank's ability to cover assets resulting from various losses due to risky assets, and a bank is considered healthy if its CAR value is at least 8%, according to Bank Indonesia Regulation No. 6/10/PBI/2004. The following formula is for calculating the CAR:

$$\text{CAR} = (\text{Capital} / \text{Risk Weighted Assets}) \times 100\%$$

Furthermore, Fatihudin and Mouchklas acknowledged that 'financial performance is the company's power to generate stable financial performance during a certain period, including assembly and disbursement of money'; as indicators, for instance, capital adequacy, liquidity, solvency, profitability, and leverage. In other words, financial performance is a business's ability to allocate, control, and manage its resources. A profitability ratio indicates the degree to which the company's control is effective. In other words, a profit ratio denotes the extent to which the company is operating at a high level of efficiency. A company's profitability can be determined by looking at how much profit it generates from sales and how much profit it makes from investments. A return on assets, or ROA, is the following formula to test this proxy:

$$\text{ROA} = (\text{Net Income} / \text{Total Assets}) \times 100\%$$

Next, technological developments are ongoing, and technological developments can facilitate business affairs. Technological developments influence most businesses, including rural banks. The definition of digital transformation, based on Westerman et al. (2014), is an organizational change that includes people, processes, strategies, and structures utilizing technology and business frameworks to improve performance. Digital transformation will lead to several innovations that will make companies more effective and efficient in running their businesses. This study measured digital transformation by calculating the total value of technology investment, consisting of hardware and software. In addition, businesses and organizations must review their business procedures in light of the unstoppable digital age. They are required to make changes and adaptations if they want to survive. Seeing Indonesia's competitiveness compared to countries in Southeast Asia, Indonesia's position is indeed in fourth place. However, this ranking is not a source of pride and requires improvement (Hadiono et al., 2021). Also, companies that are successful in their digital transformation efforts can change their mindset, strategies, and culture to keep up with the ever-evolving needs of their business. However, the research model in Figure 2 contains independent variables, including financing quality, capital quality, mediating financial performance, and moderating digital transformation, as well as a dependent variable that represents business sustainability.

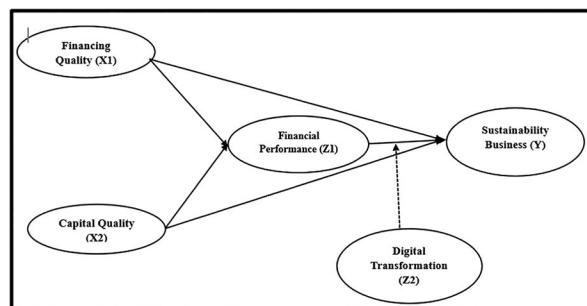


Figure 2. Research model.

### 3. Research method

This study adopted a quantitative research method. The main data are secondary sources, i.e. primarily annual reports and financial statements of Islamic rural banks (IRBs) operating in Indonesia, known as Sharia People's Financing Bank (BPRS). These banks operate under Sharia principles, providing various financial services in compliance with Islamic law. Furthermore, this research employed purposive sampling, a technique for sample determination, where the researchers selected a sample from the population based on the research aim or problem, ensuring the sample accurately reflects previously known characteristics of the population. The authors selected these sources for their reliability and availability, as they offer comprehensive insights into the financial performance and operational aspects of the IRBs. The data frame spanned five years. This study's population consisted of Islamic rural banks. The selection of the sample was based on strategic criteria to ensure representation across different regions and capture a diverse range of operational dynamics within the industry. Specifically, key urban centers, such as Jakarta, Bogor, Depok, Tangerang, and Bekasi, housed the majority of the selected banks. The authors selected these areas due to their high cash turnover, indicating significant economic activity and potential variations in banking operations.

#### 3.1. Data

The authors obtained the data for this study from secondary sources and self-extraction from the annual reports and financial statements of Islamic rural banks (IRBs) in Indonesia. The quantitative data were numerical, such as net income or total assets for the financial year frame of 2016–2021. The data size in five years was 150 observations for 30 banks. The sample selection was based on specific criteria to ensure representation across different regions, and the majority of the selected banks were located in key urban centers, such as Jakarta, Bogor, Depok, Tangerang, and Bekasi. The financial and non-financial data were published online on each bank's website, and the official website of the Financial Services Governmental Authority is available at [www.ojk.go.id](http://www.ojk.go.id). No rights or permissions are required to obtain this publicly available data.

Additionally, the Central Bureau of Statistics, through its online regional economic growth data publication on [www.bps.go.id](http://www.bps.go.id), provides the public with unrestricted access. However, several factors motivated the selection of the 2016–2021 period. This period encompasses various economic phases, including growth, stability, and the onset of the COVID-19 pandemic in 2020. Analyzing data from this period allows for an assessment of how Islamic rural banks adapted to different economic conditions, including crisis management during the pandemic. By examining six years, the researchers could identify trends and long-term impacts on the performance of Islamic rural banks, providing more robust and reliable conclusions. Here is [Table 1](#) summarizing the research sample selection criteria:

Purposive sampling in this research, known as judgmental or selective sampling, is a non-probability sampling method where the researchers select participants based on specific characteristics or criteria that are most relevant to the research question. This technique allows the researcher to focus on particular subjects that will provide the most insightful data. The researchers followed purposive sampling steps. First, the criteria were defined. The characteristics or criteria for the samples were clearly defined, as shown in [Table 1](#) above. For instance, the authors excluded banks that have not consistently reported and published annual reports, those with fewer total assets exceeding IDR 100 billion, and those that have generated profits during the research period. Second, the population was identified, and the overall population that met these criteria and the final sample were identified. Third, a sample was selected

**Table 1.** Selection criteria.

|   | Criteria                                                                 |                    |
|---|--------------------------------------------------------------------------|--------------------|
| 1 | Total Population are Islamic rural banks in Indonesia                    | 165                |
| 2 | Exclude the banks not continuously reported and published annual reports | (93)               |
| 3 | Exclude the banks fewer total assets > IDR 100 billion                   | (42)               |
| 4 | Generated profits during the research period                             | 30                 |
| 5 | The final sample                                                         | 30                 |
| 6 | Total research period and observation                                    | 5 years X 30 = 150 |

**Table 2.** Definitions of operational variable.

| Variable                   | Operational definition                                                                                                                                                                         | Measurement                                                           |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| Financing quality (X1)     | Substandard Financing, Doubtful Financing, and Bad Financing are financial instruments that fall into the collectability category.                                                             | $NPF : (Non\ Performing\ Financing) \times 100\%$                     |
| Capital quality (X2)       | A bank's asset coverage ratio is a measure of how much money a bank can afford to pay out after various losses due to risky assets.                                                            | $CAR : \left( \frac{Capita}{Risk\ Weighted} \right) \times 100\%$     |
| Financial performance (Z1) | Description of the achievements of the success of a company, which can also be interpreted as the results achieved by the company or organization for the activities that have been conducted. | $ROA : \left( \frac{Net\ Income}{Total\ Assets} \right) \times 100\%$ |

from this population that is most likely to provide relevant and rich data, such as the total research period and observations.

Consequently, this research's purposive sampling introduced biases due to its non-random sample selection, such as potentially limiting the generalizability of the findings to the entire population, particularly for banks that did not consistently report and publish annual reports in this research. However, the authors mitigated biases by establishing clear criteria and defining objective criteria for selection, thereby reducing personal bias. In addition, the sample must encompass a diverse range of years for the authors in order to guarantee fair results. Purposive sampling is beneficial for in-depth studies that require specific insights, but it is essential to recognize and address potential biases to boost the credibility and generalizability of the research findings.

Additionally, the researchers implemented purposive sampling to guarantee representativeness in this study. Firstly, the researchers established relevant and well-defined criteria based on the research objectives, which aim to investigate the impact of financing quality and capital quality on business sustainability, as well as the impact of these factors on financial performance. These criteria closely align with the characteristics the authors studied. Secondly, the authors ensure a diverse sample selection and inclusivity by including a range of years to meet the criteria. This diversity helps capture various financial performance results within the targeted banks.

Furthermore, the Partial Least Squares (PLS) method was employed to analyze the collected data. PLS is a robust statistical technique suitable for structural equation modeling and path analysis, particularly when dealing with complex models or relatively small sample sizes. It allows for the simultaneous examination of multiple variables and their interrelationships, making it well-suited for exploring the factors influencing the performance and growth of Islamic rural banks. Table 2 below provides operational definitions of the research variables and variables measurements:

## 4. Results

The outer model assessment evaluates the robustness and validity of the study variables. Cronbach's alpha and reliability can be used to assess reliability, whereas validity can be considered by examining the average variance extracted (AVE). The table below displays the results of the reliability and validity assessments.

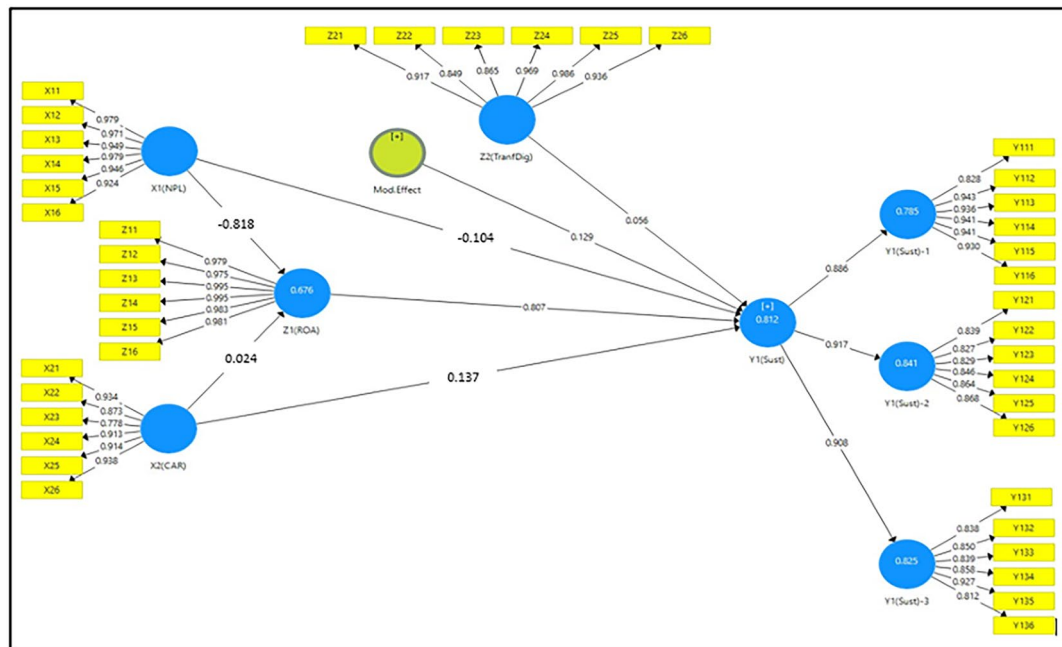
Table 3 displays that the assessment results indicated that Cronbach's alpha values for the financing quality variable (0.70), quality of capital variable (0.75), financial performance variable (0.80), digital transformation variable (0.85), and business sustainability variable (0.90) for Islamic rural banks (Indonesia) were all above 0.70. All indicators could thus be considered to have passed the reliability test. Also, the results of the composite reliability assessment revealed that the financing quality analysis result, capital quality, financial performance, digital transformation, and business sustainability all had a composite reliability value above 0.50, fulfilling the consistency assessment. Besides, the AVE summary revealed that the AVE values for the financing quality variable, capital quality, financial performance, digital transformation, and business sustainability were greater than 0.50; this indicates that all reflective constructs had good discriminant validity.

The inner model in Figure 3 was evaluated by calculating the coefficient of determination, R<sup>2</sup>, which is a measure of the extent to which dependent data can be reconciled with independent data. Table 3 presents the results of this R-square calculation.

**Table 3.** Construct reliability and validity.

| Variables     | Cronbach's alpha | Composite reliability | Average variance extracted (AVE) |
|---------------|------------------|-----------------------|----------------------------------|
| Mod_Effect    | 1.000            | 1.000                 | 1.000                            |
| X1 (NPF)      | 0.982            | 0.985                 | 0.918                            |
| X2 (CAR)      | 0.950            | 0.960                 | 0.801                            |
| Y1 (Sust)     | 0.964            | 0.967                 | 0.619                            |
| Z1 (ROA)      | 0.994            | 0.995                 | 0.970                            |
| Z2 (TranfDig) | 0.967            | 0.944                 | 0.738                            |

Source: Data processed 2023.

**Figure 3.** Inner model.**Table 4.** R-square.

| Var       | R-square | R-square adjusted |
|-----------|----------|-------------------|
| Y1 (Sust) | 0.815    | 0.777             |
| Z1 (ROA)  | 0.575    | 0.543             |

Source: Data processed 2023.

Table 4 demonstrates that the variable quality of finance and capital exerted a combined impact of 77.7% on the business sustainability variable, with the remaining 22.3% being influenced by external variables beyond the scope of this research. It also denotes that the financing quality and capital quality variables had a combined impact of 54.3%, while the other 45.7% were affected by outside variables.

Moreover, the study used the Partial Least Squares (PLS) method for data analysis, which is particularly suitable for complex models and smaller sample sizes. PLS allows for the simultaneous examination of multiple variables and their interrelationships. The authors evaluated the measurement and structural models in the following steps. The first step entailed evaluating the measurement models by reliability assessment, Cronbach's alpha. This statistic measures internal consistency, or how closely related a set of items are as a group. The study discovered that Cronbach's alpha values for the variables varied from 0.70 to 0.90, indicating a range of acceptable to high reliability. The values for financing quality were 0.70, capital quality 0.75, financial performance 0.80, digital transformation 0.85, and business sustainability 0.90. Moreover, the authors employed composite reliability, and the composite reliability values were all above 0.50, indicating consistent results across different indicators for each variable. This measure accounted for both the reliability and the consistency of the latent constructs. Thus, average variance extracted (AVE) values were all above 0.50, showing excellent discriminant validity. This indicates that the

constructs capture more variance due to the underlying variable rather than measurement error. The AVE values for each variable were as follows: The AVE values for each variable were as follows: financing quality: 0.918, capital quality: 0.801, financial performance: 0.970, digital transformation: 0.738, and business sustainability: 0.619.

Additionally, the Structural Model Evaluation in this research is as follows. First is the inner model (path analysis). The inner model was evaluated using the R-Square ( $R^2$ ) value, indicating the proportion of variance in the dependent variables that can be explained by the independent variables, business sustainability (Y):  $R^2 = 0.815$  (adjusted  $R^2 = 0.777$ ) and financial performance (Z1):  $R^2 = 0.575$  (adjusted  $R^2 = 0.543$ ). The second are path coefficients and significance, in which the authors found that the impact of financing quality and capital quality on business sustainability was 77.7%, with external variables influencing the remaining 22.3%. Similarly, the combined impact on financial performance was 54.3%, with 45.7% affected by factors outside the study's scope. In summary, the PLS approach was effective in evaluating both the measurement and structural models within this study. The measurement model was robust because it ensured high reliability and validity using Cronbach's alpha, composite reliability, and AVE. The structural model's path analysis demonstrated significant relationships among the variables, highlighting the influence of financing quality and capital quality on both business sustainability and financial performance of Islamic rural banks in Indonesia.

#### 4.1. Hypothesis testing

A hypothesis test was conducted by assessing the structural equation model path coefficient. The results of the research on direct and indirect effects can be explained in Tables 5 and 6 as follows:

The findings shown in Table 5 offer a comprehensive analysis of the direct effects observed among the variables under scrutiny. The analysis revealed several key insights regarding the impact of financial and capital quality on business sustainability and financial performance within the context of Islamic rural banks in Indonesia. The results of the first hypothesis test indicated a significant negative impact of financing quality on business sustainability practices, underscoring the considerable influence of NPF on business sustainability. Consequently, the first hypothesis found empirical support. Conversely, the second hypothesis test showed that the quality of capital did not have a significant impact on the sustainability of Islamic rural banks' businesses in Indonesia. Therefore, the second hypothesis was not supported. On the other hand, the third hypothesis test uncovered that the quality of financing had a significant positive effect on financial performance, and it can be concluded that the third hypothesis was supported. Furthermore, the fact that the fourth hypothesis test indicated that capital quality had a significant positive effect on financial performance led to the conclusion that the fourth hypothesis was supported.

Interestingly, the fifth hypothesis test demonstrated a notable positive relationship between financial performance and business sustainability practices, based on which the fifth hypothesis was supported. Moreover, the test of the sixth hypothesis results exposed that the P-value of the influence of digital

**Table 5.** Direct impact.

| Var                     |    | Statistics | p_Val | Description     |
|-------------------------|----|------------|-------|-----------------|
| X1(NPF) → Y1(Sust)      | H1 | 2.076      | 0.038 | Significant     |
| X2(CAR) → Y1(Sust)      | H2 | 0.497      | 0.089 | Not Significant |
| X1(NPF) → Z1(ROA)       | H3 | 2.094      | 0.037 | Significant     |
| X2(CAR) → Z1(ROA)       | H4 | 1.977      | 0.049 | Significant     |
| Z1(ROA) → Y1(Sust)      | H5 | 2.402      | 0.017 | Significant     |
| Z2(TranfDig) → Y1(Sust) | H6 | 1.975      | 0.019 | Significant     |

Source: authors data 2023

**Table 6.** Indirect effect.

| Variable                     | Statistics | p_Values | Description       |
|------------------------------|------------|----------|-------------------|
| X1(NPL) → Z1(ROA) → Y1(Sust) | 2.302      | 0.0194   | Full Mediation    |
| X2(CAR) → Z1(ROA) → Y1(Sust) | 2.306      | 0.0192   | Partial Mediation |
| Mod Effect → (Sust)          | 2.253      | 0.0211   | Moderating        |

Source: Data processed 2023.



transformation on business sustainability was  $0.019 < 0.05$ , indicating a positive effect on business sustainability. This underscores the pivotal role of financial performance in fostering business sustainability outcomes. Moreover, the analysis delved into the influence of digital transformation, revealing a statistically significant positive effect on business sustainability and further emphasizing the interconnectedness between financial performance and sustainable outcomes. These insights shed light on the intricate dynamics governing financial and capital quality within the unique context of Islamic rural banks in Indonesia, offering valuable implications for practitioners and policymakers alike.

The indirect effect test results depicted in Table 6 offer valuable insights into the relationships between various variables. Firstly, the analysis revealed that financial performance acts as a mediator in the relationship between financing quality, represented by non-performing financing (NPF), and business sustainability practices within Islamic rural banks. This signifies that financial performance serves as an intermediary mechanism through which the impact of financing quality on business sustainability outcomes is channeled. Secondly, the examination indicated that the influence of capital quality on the business sustainability operations of Islamic rural banks in Indonesia could be partially mediated by financial performance. This suggests that while capital quality directly impacts business sustainability practices, financial performance plays a role in mediating this relationship to some extent. Finally, the analysis underscores the moderating effect of digital transformation on the relationship between financial performance and business sustainability practices. This implies that the influence of financial performance on business sustainability outcomes within Islamic rural banks is not static but varies based on the degree of digital transformation implemented within the organization, highlighting the evolving dynamics of modern banking practices in the digital era.

The results of this study, which describe the effects of financial performance and digital transformation on business sustainability, are mediation and moderation analyses. The mediation relation occurs when a mediator variable transmits an independent variable's effect on a dependent variable. In this study, financial performance (measured by return on assets ROA) serves as a mediator between financing quality (non-performing financing, NPF) and business sustainability, as well as between capital quality (capital adequacy ratio, CAR) and business sustainability. The study focuses on the relationship between financing quality (NPF), financial performance (ROA), and business sustainability (Y1). According to the analysis, financial performance completely mediates the relationship between financing quality and business sustainability. This means that NPF impacts business sustainability indirectly through its effect on ROA. Furthermore, a P-value of 0.0194 indicates that this mediation is statistically significant. Financial performance partially mediates the relationship between capital quality and business sustainability in the capital quality  $\rightarrow$  financial performance (ROA)  $\rightarrow$  business sustainability (Y1) model. This suggests that CAR had both direct and indirect effects (through ROA) on business sustainability, and the P-value of 0.0192 demonstrated the statistical significance of this partial mediation.

Nevertheless, the moderation analysis is needed once the moderation occurs when the strength or direction of the relationship between two variables depends on a third variable, known as the moderator. This study examined digital transformation (Z2) as a moderator of the relationship between financial performance (ROA) and business sustainability (Y1). Digital transformation (Z2) significantly moderates the relationship between financial performance (ROA) and business sustainability (Y1). This suggests that the extent of digital transformation within the banks influences the impact of ROA on business sustainability. A P-value of 0.0211 highlights the statistical significance of this moderating effect. Moreover, a mediation analysis was discovered. ROA's complete mediation in the relationship between NPF and business sustainability emphasizes the critical role of financial performance. It implies that improving financial performance can mitigate the adverse effects of non-performing financing on sustainability. The partial mediation between the quality of capital assets and a business's sustainability demonstrates that, although capital quality directly influences sustainability, financial performance significantly influences the channeling of this effect.

In the moderation analysis, the moderating influence of digital transformation highlights the significance of embracing digital technologies. The increasing digital transformation enhances the positive effects of financial performance on business sustainability, underscoring the dynamic nature of modern banking practices. These analyses provide a comprehensive understanding of how various factors interact to influence business sustainability in Indonesia's Islamic rural banks. The mediation analysis exhibits

the pathways through which financial and capital quality affect sustainability, while the moderation analysis illustrates how digital transformation can alter these relationships. Consequently, the detailed explanations and statistical significance presented in the current paper underscore the robustness of the findings and their implications for practice and policy in the context of Islamic rural banks.

## 5. Discussion

The first hypothesis test's statistical analysis supports the proposition that financing quality has a negative influence on Islamic rural banks' business sustainability practices. Particularly, the prevalence of non-performing financing (NPF) emerges as a critical factor influencing business sustainability. This finding aligns with the fundamental principle that effective management of financing quality is pivotal for ensuring the sustainability of banking operations. Thus, practitioners in Islamic rural banks must prioritize strategies aimed at minimizing NPF to enhance their sustainability efforts. Moreover, the findings mean that poor financing quality has a negative impact on the profitability of Islamic rural banks. This is an indication that Indonesian Islamic rural banks have successfully managed to reduce the high NPF value, resulting in a more sustainable business model due to the reduced NPF value. The findings of this analysis are harmonious with those of Kurniawansyah and Mutmainah's (2013) study, which found that non-performing financing (NPF) significantly affects sustainable banks in Indonesia. According to a study by Phung et al. (2022), non-performing loans have also affected bank efficiency, which will influence sustainability in the banking business.

Based on the second hypothesis, the quality of capital did not impact the sustainability of Islamic rural banks' businesses. The outcome is consistent with Harahap and Effendi (2020), who discovered that the quality of capital (CAR) did not affect the business sustainability of Islamic rural banks in Indonesia and confirmed the impact of non-performing loans on the commercial sustainability of banks listed (IDX). Thus, bank management must stake a portion of the capital, at least 8%, as part of the bank finances they manage, according to Bank Indonesia regulations focused on the Bank for Indonesia Settlement (BIS). The Capital Adequacy Ratio (CAR) indicates the seriousness of bank management's ability to comply with these regulations. Moreover, Dendawijaya (2005) stated that the CAR ratio is a measure of the extent to which all the risk-bearing assets of a bank, including loans, investments, and securities, in addition to funds raised from external sources, including loans, funds from social partners, and other sources. Therefore, the outcome of the research supports Harahap and Effendi (2020) conclusion that the CAR does not affect the sustainability of the bank's operations in Indonesia. It is for this reason that the following null hypothesis is formulated, i.e. the capital adequacy ratio does not have a significant relationship with the bank's listed operations on the Indonesian Stock Exchange from 2016 to 2020 (Henry & Ruslim, 2022). Mulazid (2017) undertook an analysis of the impact of CAR on the business sustainability of Islamic banks and discovered that CAR was not a key factor that impacted the business sustainability of the banks.

Accordingly, the third hypothesis indicates that non-performing finance has a considerable detrimental impact on ROA. This demonstrates that Indonesian Islamic rural banks can lower the percentage of non-performing loans below 5%. As a result, there is a level of efficiency that ultimately affects how well Indonesia's Islamic rural banks are performing financially. In the same vein, Masrurroh and Mulazid (2017) analyzed the effects of the CAR on business sustainability and concluded that the capital adequacy ratio (CAR) did not have an impact on business sustainability. According to Alshatti (2015), credit risk significantly lowers the profitability of commercial banks in Jordan. Husaeni (2017) also stated that non-performing financing (NPF) has a significant negative impact on the financial performance of Islamic rural banks, and according to NPF, it has an undesirable impact on the financial performance of banks, as stated (Khalifaturofi'ah & Nasution, 2016).

Meanwhile, the results presented in this study unveiled that quality capital enhances financial performance with an increasing capital adequacy ratio (CAR). This implies that the rural Islamic banks in Indonesia possess sufficient capital to conform to the minimum capital adequacy ratio requirement set by Bank Indonesia. Consequently, the policy of estimating bad loans in a bank depends on the capital adequacy ratio, which has implications for the financial performance of Islamic rural banks. Sunaryo's Sunaryo (2020) research, which highlighted the significant positive impact of the CAR on financial

performance, finds support in the conclusions drawn from this study. Karugu et al. (2018) evidence confirms a positive relationship between the capital adequacy ratio and the financial performance of Kenyan public banks. The research papers conducted by Yusuf and Surjaatmadja (2018) and Irawati et al. (2018) have revealed that CAR has a positive relationship with the bank's profitability and financial performance for both Islamic and Indonesian banks.

Nevertheless, the results of this study suggest that ROA, which measures financial solvency, has a positive and significant relationship with business sustainability in the Islamic rural banks of Indonesia. This means that even though the return on assets declined during the COVID-19 pandemic, the Islamic rural banks in Indonesia have been doing relatively well. Consequently, the more competently an Islamic rural bank operates in business, the higher the efficiency of its financial outcomes. Also, the results of this investigation align with the conclusions of research conducted by Siswanti and Sukoharsono (2019), which showed that financial stability significantly increases the capacity of Indonesian Islamic banks to continue operations. According to Siswanti et al. (2017) and Siswanti and Cahaya (2020), the impact of financial performance on business sustainability is one of the key determinants of business sustainability.

According to the current study, (NPF), which is a measure of the quality of the financing, has a significant impact on the sustainability business in Indonesia. It denotes that Islamic rural banks in Indonesia can maintain the value of the NPF within the limits of Bank Indonesia's regulations. The cost-effectiveness will make an increase in the value of the financial performance, which will, in turn, lead to an increase in the sustainability of Islamic rural banks in Indonesia. This result is in harmony with Siswanti et al. (2017) study, showing that financial ratios can affect business sustainability, with the medium variable being financial performance. The study's findings also uncovered that financial performance plays a role in mediating the effect of capital quality, as expressed in the capital adequacy ratio (CAR), on the viability of business in Islamic rural banks in Indonesia. This finding signifies that, on average, Islamic rural banks in Indonesia can only demonstrate their capital adequacy ratios (CAR) in accordance with Bank Indonesia's regulations, even though Islamic rural banks in Indonesia should be concerned with maintaining and enhancing the quality of their capital to sustain their sustainability business. However, the importance of the capital adequacy ratio (CAR) can still raise the importance of financial performance, which ultimately continues to have an impact on the sustainability of business for Indonesian rural Islamic banks. In addition, this study verifies Siswanti and Cahaya (2020) findings that financial performance can mediate the impact of financial ratios on the sustainability of the business of Islamic banks in Indonesia.

Lastly, the findings of this research revealed that digital transformation moderated the impact of financial performance on the long-term viability of Islamic Indonesian banks. This demonstrates the significance of digital transformation for Islamic banks' commercial growth in Indonesia, particularly during the COVID-19 pandemic. As a result, both financial and non-financial factors, such as the advancement of digital transformation, influence the business sustainability of Islamic rural banks in Indonesia. The results of this study confirm Karagiannaki et al. (2017), who claim that technological advancement can alter the current industry and business structure. They also revealed the advantages and difficulties associated with digital transformation for a company's ability to sustain its operations. According to research by Yanti et al. (2018), technical advancement and innovation have a big impact on how long microbusinesses can survive.

Four main points sum up the significance of this research's findings. Firstly, this research demonstrates the critical role of strategic decision-making and policy formulation in helping Indonesian Islamic rural banks achieve sustainable growth and resilience in a constantly changing financial environment. This is because the market's growth potential allows Islamic banking to expand, unlike conventional banks that cater to one of the world's largest Muslim populations. Islamic rural banking institutions have a market share of less than 10%, indicating huge development potential. As of mid-2022, there were 164 Islamic rural banks compared to 1453 conventional rural banks, showing the sector's underrepresentation and growing potential. This study demonstrated that Indonesian Islamic rural banks take advantage of this potential. Secondly, the impact on sustainability is another factor to consider. Islamic rural banks' market share is critical for their long-term viability. A larger market share would enhance their ability to sustain and grow their business, impacting the broader local economy.

Third, the research gives attention to technological integration. In today's tech-savvy society, banking operations must incorporate technology. To compete, Islamic rural banks must incorporate technology. This outcome suggests that Islamic rural banks require innovation and digital transformation to remain competitive. In particular, many financial transactions that lack digitization have a negative impact on efficiency and the consumer experience. Therefore, cloud computing, big data, mobile computing, social computing, and analytics can boost efficiency and customer satisfaction. Fourth, the impacts on the environment, society, and economy are significant. Digital transformation impacts corporate sustainability. To be competitive and meet the demands of consumers, shareholders, and other stakeholders who are more conscious of businesses' environmental, social, and economic implications, companies must prioritize digital transformation.

Consequently, based on research findings, some specific recommendations for Islamic rural banks to improve business sustainability can be proposed. First, financing quality is improved by conducting a rigorous credit assessment. Rigorous credit assessment procedures are implemented to ensure high-quality financing and reduce non-performing financing (NPF). This can include thorough background checks, risk assessments, and continuous monitoring of financed projects. Furthermore, conducting regular monitoring and evaluations of financed projects is crucial to identifying and mitigating potential risks early on. Maintaining quality financing and ensuring timely loan repayments are critical. One important step is to educate customers on the importance of timely repayments and the benefits of maintaining excellent credit standing. This can help reduce the incidence of NPF. Second, cost management can be enhanced by implementing efficient cost management practices to optimize operational expenses and improve profitability. This includes streamlining processes, reducing waste, and leveraging economies of scale. Moreover, revenue diversification involves exploring new revenue streams and diversifying income sources to enhance financial performance. This can involve offering new financial products and services that cater to the needs of the local community. Third, digital technologies are invested in to streamline operations, customer service is improved, and overall efficiency is enhanced by adopting technological innovations. This can encompass the implementation of online banking platforms, mobile applications, and automated customer service systems. Finally, by implementing these recommendations, Islamic rural banks can enhance their business sustainability, ensuring long-term growth and resilience in a dynamic financial landscape.

## 6. Conclusion

It is evident from the above summary discussion and findings that (NPF), a measure of financing quality, has an impact on sustainability businesses. Furthermore, financing quality's effect on Islamic rural banks' financial performance exhibits a significant impact. Meanwhile, the CAR's measure of capital quality also reveals no impact on business sustainability. On the contrary, the capital quality impact on Islamic rural bank business sustainability identifies a meaningful positive impact. The findings of the study also uncovered that financial performance fully mediates the effect of financing quality on the business sustainability of Islamic rural banks in Indonesia and partially mediates with capital quality on the business sustainability of Islamic rural banks in Indonesia. At last, the study results indicate that digital transformation has a moderating effect on the financial performance of Indonesian Islamic rural banks, thus contributing to their business sustainability.

The findings of this research make a valuable contribution to the understanding of the factors influencing the sustainability of Islamic rural banks in Indonesia. On the other hand, the research unveils a significant negative impact of financing quality on the business sustainability of Islamic rural banks, while capital quality demonstrates a meaningful positive impact. These nuanced findings underscore the complex interplay between different financial metrics and their implications for the sustainability of Islamic rural banks. The study also introduces the mediating role of financial performance in the relationship between financing quality and business sustainability, as well as the partial mediation of capital quality in the same context. These mediating effects provide a deeper understanding of the mechanisms through which financing and capital qualities influence the overall sustainability of Islamic rural banks in Indonesia. In practical terms, the contribution of this study extends to the operations of Islamic rural banks in Indonesia. Emphasizing the significance of maintaining a high-quality capital adequacy ratio, especially in the face of potential financing risks, this study provides actionable insights for these banks to enhance

their sustainability. Additionally, the recognition of digital transformation as a moderating force highlights the necessity for Islamic rural banks to adapt and leverage technological advancements to secure their long-term success in an increasingly digitized business environment. Overall, this research contributes valuable insights that can inform strategic decision-making and policy formulation for Islamic rural banks in Indonesia, promoting their sustainable growth and resilience in a dynamic financial landscape.

This study has policy implications for the operations of Islamic rural banks in Indonesia, as it emphasizes the importance of maintaining a capital adequacy ratio that is of the highest quality. This is due to the banking business's primary purpose, which is to generate revenue from the public and redistribute it to the local community. Therefore, when there is an unwanted financing risk, the bank's capital will be eroded to cover problematic financing. Thus, maintaining the quality of financing and capital is crucial for ensuring the sustainability of the Islamic rural bank business. Furthermore, the development of digital transformation is something that cannot be avoided, considering that almost all current and future businesses use technology. This will certainly have implications for the business sustainability of Islamic rural banks in the future.

Based on its findings, this research presents several practical implications. First, Islamic rural banks should mitigate financing risks and actively manage and mitigate non-performing financing (NPF). This could involve implementing stringent risk assessment and management practices to reduce the likelihood of defaults and delinquencies. Second, for leveraged financial performance, since financial performance fully mediates the effect of financing quality and partially mediates the effect of capital quality on business sustainability, Islamic rural banks should prioritize improving their financial performance metrics. This may include enhancing efficiency, profitability, and asset quality to positively influence overall sustainability. Third, Islamic rural banks should embrace technological advancements to enhance operational efficiency, customer service, and product innovation. This entails investing in digital infrastructure, adopting digital banking solutions, and fostering a culture of innovation to remain competitive in the digital era. The insights from this research can inform strategic decision-making and policy formulation for Islamic rural banks in Indonesia. Banks can also use these findings to develop targeted strategies aimed at improving their sustainability and resilience in the dynamic financial landscape. Additionally, policymakers can leverage these insights to formulate supportive policies that foster the growth and stability of Islamic rural banks.

The policy recommendations suggested by this research are as follows. First, to enhance financing quality, policymakers should encourage Islamic rural banks to prioritize the quality of financing provided to customers. This may involve implementing stricter lending standards, ensuring compliance with Islamic finance principles, and promoting responsible lending practices. Second, policies aimed at improving the capital quality of Islamic rural banks should be implemented. This could include measures to strengthen capital reserves, enhance risk management practices, and encourage capital injections where necessary. Third, policymakers should support digital transformation initiatives in Islamic rural banks. This may involve providing financial incentives, offering technical assistance, and fostering partnerships with technology providers to facilitate the adoption of digital banking solutions. Fourth, in terms of promoting collaboration, collaboration among Islamic rural banks, regulatory authorities, and other stakeholders can facilitate knowledge sharing and best practice exchange. Policymakers should encourage collaborative initiatives aimed at promoting sustainability and innovation in the rural banking sector. Finally, the research highlights the significance of understanding the factors influencing the sustainability of Islamic rural banks. It provides actionable policy recommendations to support their growth and resilience in the evolving financial landscape.

On the basis of the research conclusions and findings, the following is a critical examination of the study's limitations and potential influence on the findings. Despite the research providing significant insights into sustainability, it is critical to acknowledge its limitations, which may affect the robustness and generalizability of the findings. Firstly, the study focuses primarily on Islamic rural banks in Indonesia, which may limit the results' applicability to other regions or types of banks. Indonesia's unique socio-economic, regulatory, and cultural context may not be directly comparable to other countries or even urban environments. Therefore, further research is needed to determine if similar patterns hold in different contexts, as the findings may not be generalizable beyond this specific setting. Secondly, the measures of financing quality (NPF) and capital quality (CAR) may not

comprehensively capture all dimensions of financial health and sustainability. While NPF and CAR are critical indicators, other factors such as liquidity ratios, management quality, and market conditions can also play significant roles. The study's findings may not fully reflect the multifaceted nature of bank sustainability if these factors are excluded. Finally, the study does not fully address the potential external factors that could influence the findings, such as economic downturns, regulatory changes, or market competition. These external factors can have a significant impact on bank performance and sustainability, and they should be considered in order to contextualize the results better. In conclusion, the study provides valuable insights into the sustainability of Islamic rural banks in Indonesia, but its limitations suggest caution in generalizing the findings. To get around these problems, future research should look at a wider range of variables, use mixed-method approaches, do longitudinal analyses, and look at external contextual factors. This will help us understand the factors that affect bank sustainability in a more complete and nuanced way.

Further future studies could pay attention to capital quality having an impact on the sustainability business of Islamic rural banks and specify the criteria or components of capital quality with more detailed exploration required to understand the specific elements of capital quality, such as capital adequacy ratios, the composition of capital, and the implications of capital structure on the sustainability of Islamic rural banks. Furthermore, a more thorough investigation is required to identify the specific digital initiatives undertaken by these banks, assess their effectiveness, and understand how they contribute to the overall sustainability of Islamic rural banks.

## Ethical approval

The authors declare this manuscript their original work, and the paper reflects their research and analysis truthfully and completely. Furthermore, the authors acknowledge the significant contributions of co-authors and co-researchers, appropriately situating the results within the context of previous and current research.

## Authors' contribution

Study conception and design: <sup>1</sup> Indra Siswanti; data collection: <sup>2</sup> Hosam Alden Riyadh; analysis: <sup>3</sup> Yohanes Ferry Cahaya; draft manuscript preparation and interpretation of results: <sup>4</sup> Yananto Mihadi Putra and <sup>5</sup> Baligh Ali Hasan Beshr.

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## About the authors

**Professor. Dr. Indra Siswanti** is a lecturer and researcher at the Faculty of Economics and Business, Universitas Mercu Buana, Jakarta, Indonesia. Her disciplines are management finance, accounting, risk management, insurance, financial economics, corporate governance, and banking. She is the corresponding author: [indra.siswanti@mercubuana.ac.id](mailto:indra.siswanti@mercubuana.ac.id)

**Dr. Hosam Alden Riyadh** is a lecturer and researcher in accounting at Telkom University in the School of Economics and Business, Indonesia. His research interests include financial accounting, corporate social responsibility, and accounting information systems. Email: [hosamalden@telkomuniversity.ac.id](mailto:hosamalden@telkomuniversity.ac.id)

**Dr. Yohanes Ferry Cahaya**, Lecturer at Universitas Dirgantara Marsekal Suryadarma, Lecturer in the fields of marketing, banking and finance.

**Dr. Yananto Mihadi Putra** lecturer at Universitas Mercu Buana, Jakarta. Lecturer in accounting and finance.



**Dr. Baligh Ali Hasan Beshr** is Associate Professor in the Department of Administrative Sciences, College of Administrative and Financial Science, Gulf University, Sanad 26489, Kingdom of Bahrain. Dr. Baligh is a Ph.D. holder in Human Resource Management at Abdelmalek Saadi University in Morocco. Specialisation: Management and Development, Specialisation: Human Resources Management, He is a certified international trainer in human development by the International Federation of Human Resources, the International Business Academy in Kingstone, Britain, and the International Academy for Training in Britain, UK.

## ORCID

Indra Siswanti  <http://orcid.org/0000-0001-9739-9246>  
 Hosam Alden Riyadh  <http://orcid.org/0000-0002-9426-5282>  
 Baligh Ali Hasan Beshr  <http://orcid.org/0000-0002-6038-6334>

## Data availability statement

The data that support the findings of this study are available from the corresponding author, Dr. Indra Siswanti, upon reasonable request.

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