# The Role of Digital Banking in Leading Sustainable Economic Development

**Alivia Meyrizka Utami**[1][✉],
**Mega Dwi Septivani** [2]
STIM YKPN Yogyakarta, Indonesia[1]
Politeknik Negeri Padang, Indonesia[2]

**Correspondence**
aliviameyrizkautami@gmail.com

**Abstract**
This research examines the influence of Digital Banking on risk-taking and sustainability reporting in banks registered in Indonesia by analyzing panel data from 55 banks in Indonesia for the 2018-2021 period, thus collecting 220 observations. The research results show that Digital Banking is proven to reduce risk-taking and improve the quality of sustainability reporting of banks in Indonesia. Future research is expected to use data over a longer period and requires confirmation from independent parties who have expertise in this field so that they can combine quantitative and qualitative approaches so that the quality of the research is better. This research provides something new in examining the role of Digital Banking in making bank decisions as represented by risk and sustainability reporting.
**Keywords**: digital banking, risk–taking, sustainability reports, COVID-19

## Introduction

The development of information and communication technology has changed the industry from manual to automated activities and from offline to online transactions, one of which has a major impact on the financial industry (Nam et al., 2016). Banks are responding to this phenomenon by creating digital banking, where banks digitize all traditional transactions and services in an application (Nguyen & Dang, 2018). Although technology has been part of the financial services industry for quite some time, it is only over the last two decades that Digital Banking has become a common term to describe technological breakthroughs that have the potential to have the power to transform the provision of financial services, driving the creation of new business models, applications, processes and products, and generate consumer benefits (Arner et al., 2015; Feyen et al., 2021). Apart from that, the endemic effect of COVID-19 has opened the eyes of banking companies to see changes in customer behavior in making transactions. Bank Indonesia noted that the number of new consumers using digital transactions skyrocketed to reach 21 million in 2022 due to the influence of the COVID-19 pandemic which in the last three years has forced people to reduce their mobility to make direct transactions at banks. The rapid development of digital technology goes hand in hand with changes in society's new habits in responding to the ongoing endemic situation. Banks must be astute in observing market conditions, especially in Indonesia, by adapting to bank capabilities and capacities and being

brave enough to take opportunities through breakthroughs and innovations even though risks may occur.

On the other hand, investor sentiment is also affected in the stock market, bond market, and forex market. The panic that occurred at the start of the pandemic caused many fund owners to withdraw their savings, and banks were at risk of experiencing bad credit. The government together with OJK and LPS have adopted a series of policies aimed at mitigating credit risk. LPS has implemented several policies, including reducing the guarantor interest rate (TBP). In banking operational activities, risk is an important factor that must be taken into account to improve and maintain bank operations. Given the important role of banks in the financial system, it is also important to understand the risks and opportunities that FinTech presents to banks, their impact on the key functions of financial intermediaries, and their impact on the modern financial services ecosystem. As a result, banks are currently facing various challenges arising from the impact of COVID-19. The growing growth of digital banking has resulted in enormous operational pressure on banks thereby impacting their risk tolerance.

COVID-19 the banking industry has become a catalyst that accelerates the maturity of implementing bank digitalization. Banks are accelerating the pace of their FinTech innovation, one of which is through the Digital Banking program by building a data platform and gradually creating a comprehensive risk control system to better adapt to major changes. Banking systems developed based on big data and other technologies can reduce transaction risks (Priyambodo, 2023) and offer commercial banks risk-taking credit. Big data can help banks identify irregularities in the use of funds or other potential risks of failure promptly, and relevant machine learning is used to avoid risks and arrive at specific solutions for different risk categories. Apart from that, this system can also improve the ability to design pre-loans, mid-loans, and post-loans thereby reducing the level of risk-taking (Sutherland, 2018).

Another thing that is no less important, digitalization has become part of the sustainability aspect, especially to improve services with the support of digital facilities which have become an absolute necessity. OJK itself has issued Regulation Number 51/POJK.03/2017 concerning the Implementation of Sustainable Finance for Financial Services Institutions, Issuers, and Public Companies, where with this regulation it is hoped that banks will respond by issuing a Sustainability Report. The hope is that banking companies can create Sustainability Reports that are based on all activities related to company sustainability. If a company carries out activities related to sustainability but chooses not to disclose a Sustainability Report, then this will be very detrimental because sustainability reporting has many benefits such as increasing positive market reactions and increasing company value (Aboud & Diab, 2018).

This research is expected to provide a new view of the world of Indonesian banking, namely: First, increasing the use of Digital Banking can reduce risk-taking in general, the higher the Digital Banking innovation a bank has, the lower the level of risk-taking it will bear. Banks must keep up with the times and embrace FinTech solutions to transform their digital transformation based on the quality and uniqueness of the innovation they offer. However, the use of FinTech can also potentially pose certain dangers, therefore all banks must improve risk management along with advances in the technology used. Second, the increasingly massive use of Digital Banking is expected to help banks improve their Sustainability Reports, because sustainability reporting in registered banks in Indonesia is still relatively low (Amidjaya & Widagdo, 2020). Third, the Government is also expected to be able to implement applicable Regulatory Technology (RegTech) measures, such as information standards and risk management indicators.

## Literature Review and Hypotheses

The banking world is faced with increasingly greater challenges in its activities related to technological advances. The Internet has pushed the banking system to reconsider its information technology strategy because there have been significant changes in digital services and mobile banking (Al-Qeisi & Hegazy, 2015; Alkhowaiter, 2020). Banks increase financial efficiency by utilizing IT technology such as artificial intelligence (AI), blockchain, cloud, big data, and internet technology (Chen et al., 2022). Financial Technology (FinTech) has changed banking business practices, and to adapt to trends they must accelerate digital transformation and increase banking FinTech innovation (Li et al., 2022).

The popularity of using digital platforms during the COVID-19 crisis is increasing (Ratten, 2022). COVID-19 served as a catalyst for adopting and increasing the use of digital technology (Amankwah-Amoah et al., 2021). Xia et al. (2022) found that companies with a high level of digital finance recovered more quickly and experienced fewer losses. Digital finance increases corporate resilience by helping reduce financing frictions. COVID-19 has substantially accelerated the adoption of FinTech platforms in payments (Tut, 2020). The global spread and use of the internet contribute to the development of digital payments (Alkhowaiter, 2020).

From a risk control perspective, banks gain technological abundance by utilizing the latest technology (Newman et al., 2015), improving risk control capabilities and management efficiency (Cheng & Qu, 2020), and increasing bank diversification in reducing credit risk (Sheng, 2021). Recent research by Duan et al., (2021) shows that systemic risk in banks around the world has increased due to the impact of the pandemic and this risk is mitigated by factors including bank regulations, ownership structure, and informal institutions. The COVID-19 pandemic intervened in monetary policy, containment measures, and relaxed restrictions on bank and FinTech share prices, this had an impact on banks' decisions to manage their risks (Kakhkharov & Bianchi, 2022).

Furthermore, in internal control, FinTech innovation can increase data accuracy thereby reducing bank costs, fraud risk, and other systematic risks (Fuster et al., 2019). Banks can use digital technology to gain "digital" benefits in terms of diversification of savings and loans to reduce intermediary costs and integrate technology more efficiently (Heredia et al., 2022). Banks that utilize advanced technology and big data can identify irregularities in the use of funds and potential risks of default (Li et al., 2022). The high level of use of digital technology allows the Bank to reduce the level of Bank risk-taking so researchers formulate the following hypothesis:

*H1: Digital Banking has a negative effect on Bank risk-taking*

The Covid-19 pandemic disrupted company business operations and increased uncertainty. This condition has significant implications for corporate reporting, one of which is sustainability reporting (Garcia-Sanchez et al., 2020; Ikram et al., 2019). Several previous studies discussed how opportunities for utilizing information and communication technology and digital innovation can overcome traditional sustainability reporting and stimulate work units to adopt a more proactive approach toward sustainability (Rodriguez et al., 2014). The use of websites to convey information (e.g. annual reports) is expected to increase dialogue, interactivity, and company engagement with stakeholders (Carvalho et al., 2020). Financial technology is a vital subject to trigger studies in all sectors because digital connectivity is an important part of sustainability (Anshari et al., 2019). Positively, digitalization provides several benefits where consumers and stakeholders are allowed to see directly company reports which increase transparency and reduces information asymmetry so that the company can develop, and compare various company products, this will create a competitive advantage among competitors and increase sustainability (Nobanee & Ellili, 2016).

Apart from reducing waste of environmental resources, Digital Banking can also increase awareness of sustainability issues among its users (Chen et al., 2018). In practice, banks can also use digital banking as a medium to promote digital and are encouraged to participate in the bank's social activities. Based on the concept of sustainability, which has so far been used mainly for banking issues, digital sustainability describes the conscious use of resources so that their creation and use are current. This does not sacrifice the needs of future generations (Amidjaya & Widagdo, 2020). These findings provide an overview of fintech as an important role for faster financial business development and innovation as well as the significant and positive impact of fintech and financial management in supporting sustainable company performance (Al Hammadi & Nobanee, 2019). The high level of use of digital technology makes the Bank increase the level of its sustainability reports so that researchers formulate the following hypothesis:

*H2: Digital Banking has a positive effect on Sustainability Reporting*

## Research Method

This research uses panel data obtained from annual reports and sustainability reports of banking companies listed on the Indonesia Stock Exchange (BEI) for the 2018-2021 period. A total of 220 observations were obtained from 55 banking companies that met the research criteria over 4 years. Hypothesis testing will be carried out using panel data regression with the STATA application. This research is also equipped with several control variables, namely corporate governance, company size, return on assets (ROA), and loan-to-deposit ratio (LDR) to anticipate possible alternative explanations in this research.

The Digital Banking variable is measured using an index developed by Cisco Consulting (Bradley et al., 2014) which consists of 21 items, namely: dial-up experience, email contact center, online brochureware, databases, customer relationship management, web-based account organization, online calculators & bill pay, click to chat & call, know your customer, seamless experience, full-function smartphone apps, internal & hybrid cloud, click to video, big data & analytics, 360 customer views, digital banks, digital branches, rich cross-channel collaboration & advice, omnichannel analytics, market one customer-centricity, and intercloud as seen from annual reports published by banking companies.

Furthermore, the Bank Risk-Taking variable is measured using assets-to-capital (Li et al., 2022). The Sustainability Reporting variable is measured using a dummy, namely 1 for banks that have a sustainability report, either in the same file as the annual report or separately, and 0 for banks that do not have a sustainability report at all. In previous studies (Amidjaya & Widagdo, 2020; Junior & Best, 2015; Khan et al., 2013), sustainability reports were closely related to the GRI Financial Service Disclosure (FSSD) index so we decided to add another dummy measurement, where 1 for companies that have adjusted their sustainability reports to GRI standards, and 0 for companies that have not adjusted their sustainability reports to GRI standards. We do this because the GRI index can be a benchmark for assessing the quality of sustainability reports because there is a structured framework that is the basis for sustainability reporting.

## Results and Discussion

### Descriptive Statistics

Table 1 shows descriptive statistical data regarding the dependent and independent variables which shows the mean, standard deviation, and min and max values for each variable.

**Table 1 Descriptive Statistics**

| Variable | Obs | *Mean* | Std. Dev | *Min* | *Max* |
|---|---|---|---|---|---|
| RISK | 220 | 6.151 | 2.657 | -0.159 | 14.735 |
| SR | 220 | 0.686 | 0.465 | 0 | 1 |
| GRI | 220 | 0.491 | 0.501 | 0 | 1 |
| DIGI | 220 | 0.574 | 0.170 | 0 | 0.905 |
| GOV | 220 | 0.191 | 0.354 | 0 | 1 |
| SIZE | 220 | 13.566 | 0.729 | 11.823 | 15.237 |
| ROA | 220 | 0.006 | 0.024 | -0.181 | 0.091 |
| LDR | 220 | 1.908 | 7.590 | 0.12 | 93.857 |

**Note:** RISK is the Bank Risk-Taking variable; SR is the Sustainability Report variable; GRI is the GRI (Global Reporting Initiative) index variable; DIGI is a Digital Banking variable

Based on Table 1, the average value results from a central tendency measurement that converts the data distribution for one variable into a number (Hair et al., 2019). Apart from that, table 1 shows that the eight variables used in this research have standard deviations ranging from 0.024-7.590 and These results indicate that the distribution of data from the sample regarding the average is quite varied.

## Determination of the Best Model

Table 2 shows the test results of Hausman, Chow, and LM in determining the best model to test each hypothesis. Hypothesis testing models 1 and 2 use Fixed Effect, and the rest use Random Effect. The results of the multicollinearity test also met the criteria, namely a VIF value < 10, so the research data was free from multicollinearity.

**Table 2 Determination of the Estimation Model**

| | Hausman Test | Chow Test | LM Test | Best Model |
|---|---|---|---|---|
| DIGI → RISK | FE | FE | RE | FE |
| DIGI → SR | FE | FE | CE | FE |
| DIGI → GRI | RE | FE | RE | RE |

**Note:** RISK is the Bank Risk-Taking variable; SR is the Sustainability Report variable; GRI is the GRI (Global Reporting Initiative) index variable; DIGI is a Digital Banking variable; FE is Fixed Effect; RE is Random Effect; and CE is Common Effect.

## Hypothesis test

Testing The research hypothesis uses Fixed Effect and Random Effect according to the results of the best model testing that has been carried out. Table 3 shows the results of testing the five hypotheses with each regression model. For hypothesis testing with Digital Banking as an independent variable, the results show that testing the Bank Risk Taking variable gives negative (-5,176) and significant results at the 1% level so hypothesis 1 is accepted. The Sustainability Report variable shows positive (2,014 for SR proxy and 0,644 for GRI proxy) and significant results at the 1% and 5% levels so hypothesis 2 is accepted.

**Table 3 Hypothesis Testing**

|  | DIGI (1) | DIGI (2) | DIGI (3) |
|---|---|---|---|
| RISK | -5.176*** | | |
| | (-3.72) | | |
| SR | | 2.014*** | |
| | | 4.99 | |
| GRI | | | 0.644** |
| | | | 2.57 |
| GOV | 6.677 | 0.304 | 0.219** |
| | 1.11 | 0.17 | 2,12 |
| SIZE | 2.726*** | 0.354 | 0.286*** |
| | 3.42 | 1.53 | 4.33 |
| ROA | -4.259 | -1.765 | -0.542 |
| | -0.73 | -1.04 | -0.45 |
| LDR | 0.023 | -0.001 | 0.003 |
| | 0.69 | -0.07 | 0.60 |
| _cons | -29.150* | -5.310* | -3.804*** |
| | -2.79 | -1.75 | -4.73 |
| N | 220 | 220 | 220 |

**Note:** RISK is the Bank Risk-Taking variable; SR is the Sustainability Report variable; GRI is the GRI (Global Reporting Initiative) index variable; DIGI is a Digital Banking variable; ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level

The first hypothesis test results are accepted, indicating that digital banking can help banks take fewer risks. Banks have expedited digital transformation and increased financial efficiency (Chen et al., 2022; Li et al., 2022). Banks employ cutting-edge technology (Newman et al., 2015), enhance their capacity for risk control and management effectiveness (Cheng & Qu, 2020), and broaden their bank portfolio to lower credit risk (Sheng, 2021). To lower intermediate costs and more effectively integrate technology, banks can profit from "digital" benefits such as diversifying savings and loans (Heredia et al., 2022). Financial institutions that leverage cutting-edge technology and big data can promptly detect anomalies in the allocation of resources and possible default hazards. Commercial banks can lower their risk-taking by utilizing FinTech advances to enhance their risk management capabilities (Li et al., 2022). Ngamal & Perjaka (2022) suggest that the adoption of digital technology in the banking industry has the potential to significantly transform bank risk management over the next ten years, as it enables banks to make more informed decisions.

The second hypothesis, according to which banks utilizing digital technology can effectively motivate other banks to provide improved sustainable reports, is likewise recognized. This is consistent with a study conducted by Prastyawan & Astuti (2023), which discovered that technology has a positive and significant effect on the disclosure of sustainable reports. In today's unpredictable world, businesses need to adapt to their surroundings quickly and effectively. Stakeholder theory states that technological innovation, or digitalization, not only helps industrial businesses become more profitable, but also stimulates economic growth, sustains jobs and the environment, and improves work processes so that businesses can maximize profits.

Digital innovation is implemented by banks to encourage work units to take a more proactive stance toward desires (Rodriguez et al., 2014). Digitalization positively encourages banks to get an advantage over rivals and fosters discontent (Nobanee & Ellili, 2016). Furthermore, according to Chen et al. (2022), digital banking can raise users' awareness of topics that pique their curiosity. Subagyo & Murwaningsari (2023) contend that to identify public interest and make sustainable reporting more transparent, user community trust is a prerequisite for the digitalization of banking.

## Conclusion

This research aims to identify how digital banking impacts risk-taking and sustainability reporting. Risk-taking, the GRI framework, and transmission, in general, are ways to deliver corporate reporting in uncertain environments, signaling ways for companies to address complex issues and reassuring stakeholders that actions are being taken to promote their interests. This research uses Fixed Effect and Random Effect to test the hypothesis. The research results show that digital banking has a negative effect on risk-taking. Banks that implement digital systems are considered to no longer carry out many risk-taking actions because banks have developed mechanisms that utilize digitalization for risk control and management efficiency so that banks reduce policies related to risk-taking. Meanwhile, for the sustainability report variable, it is proven that digital banking positively affects bank poisoning reports, both using general standards (OJK) and GRI standards. This indicates that digitalization provides easy access so that it can better manage the cycle of poverty.

This research provides insight into the challenges and opportunities of Digital Banking. Banking digitalization provides benefits in reducing bank risk-taking and improving the quality of company sustainability reports, so researchers recommend the importance of a better stability monitoring mechanism for the Digital Banking system for implementing regulations. Apart from that, the regulator can launch a socialization or introduction program about the convenience, practicality, and security of digital banking to increase the trust and financial literacy of all Indonesian people.

## Acknowledgment

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