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Accounting Evaluation: Digital Transformation as Moderating Variable in Fintech, Green Finance, And Blue Finance Impact on Banking Financial Performance

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ABSTRACT

This study aims to examine the influence of fintech adaptation, green finance and blue finance on financial performance moderated by digital transformation. The research was conducted on banking sub sector companies listed on the Indonesia Stock Exchange (IDX) for the period of 2021-2023, totalling 141 observation data. The research results using WRAP PLS analysis found that fintech adaptation and green finance do not affect financial performance while blue finance has a significant impact on financial performance. Furthermore, the moderation test results showed that digital transformation moderates the effect of fintech adaptation and green finance on financial performance, but does not moderate the effect of blue finance on financial performance. The research findings support stakeholder's theory, indicating that banks must play a role in providing policy support to the government in realizing environmentally-oriented investments.

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1. INTRODUCTION

The massive use of information technology and digitalization has significantly impacted the transformation of business models in Indonesia, both in the financial and non-financial sectors (Lisnawati et al., 2024). According to data from PWC (2021), there has been a shift in the behavior of bank customers in Indonesia. Around 80% of customers have switched to digital services, and 25% of them prefer to open new accounts using digital platforms. In addition, the presence of e-wallets has shifted customer behavior from cashless to e-wallets due to ease of use and services. According to data from a BI publication, there was a 44% increase in e-wallet usage in 2020 compared to the previous year (bicara@bi.go.id). This was also accompanied by an increase in the financial performance of Indonesian banks from 2020 to 2021 (bi.go.id). Observing this significant phenomenon, banks in Indonesia have begun moving towards adapting to technological disruption by implementing strategies aimed at digital services. Banking also needs to play a role in achieving sustainable finance as a major agenda during Indonesia's G20 Presidency in 2023. The strategies that need to be formulated by banks are increasingly broad and must be able to keep up with the current change. On the other hand, an accounting evaluation is needed to assess the achievement of financial performance. Accounting evaluation is an effort to assess the information, procedures, and accounting practices used. Therefore, rapid adaptation is required to align with the digital transformation that is making financial transactions more efficient and effective. The presence of financing for green and marine projects through digital services offers a solution for banks to maintain their financial performance at an optimal level.

The massive adaptation of fintech is necessary for banks to anticipate changing consumer needs. The use of technology provides benefits for banks in terms of operational and administrative costs. This has encouraged commercial banks around the world to adopt electronic banking (Yakhlef, 2001). However, these benefits can be realized through increased adoption of mobile banking by bank customers (Gikandi and Bloor, 2010). Apart from cost reduction through fintech utilization, other benefits are closely related to the level of e-banking acceptance and competitive advantage (Idowu, Alu, and Adagunodo 2002). Meanwhile, research (Abubakar, 2018) shows broader results indicating a positive relationship between mobile banking, agency banking, ATM banking, and online banking with financial performance in the banking sector of Kenya.Similarly, green financing has a positive influence on financial performance (Yu et al., 2023). Green finance aims to provide financial support for environmental protection projects (Ouyang and Yu, 2023). Amid unexpected economic challenges, environmentally conscious finance has become a top priority for development by the banking sector (Ziolo et al., 2019). The increasing diversity of purpose-driven financing will impact financial performance. Therefore, significant efforts are needed to combine the right portfolio of specializing financing with technology.

Digital finance and financial innovation support environmentally friendly finance (Ozili, 2021). Nassiry (2019) conducting a study on fintech and green finance with the finding that the use of blockchain can support sustainable development and renewable energy. Financial instrument innovation is expanding and covers many aspects, including one recently highlighted in relation to financing the maritime sector, or blue finance. The concept has attracted international attention as an effort to support the blue economy and preserve marine environments, as noted by the Ocean Policy Research Institute (OPRI) in 2019.

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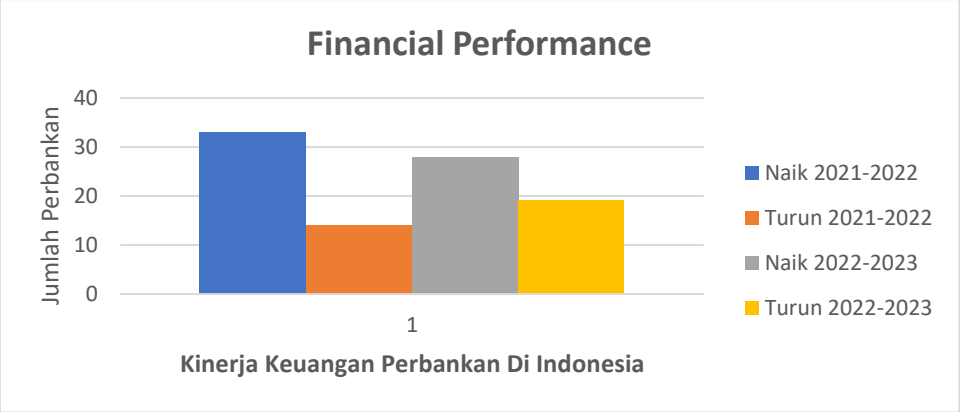

Source: bi.go.id

Figure 1. Financial Performance

Most previous studies related to digital transformation, fintech, and green finance show a positive impact on financial performance (Abubakar, 2018; Kaddumi et al., 2023; Yu et al., 2023; Indrianti et al., 2022). However, research on blue finance and its impact on financial performance is still limited. To the best of the author's existing blue finance studies have only focused on marine-related concepts (Wanta and Gunawan, 2023) and have not yet examined its impact on financial performance. therefore, the motivation for this study is based on an empirical gap, namely the limited research that integrates fintech with green finance and blue finance in relation to financial performance. financial performance is a crucial disclosure to assess the extent to which the presence of fintech can enhance revenue from banking products offered in the rea of digital transformation and technological disruption occurring in Indonesia. The novelty of this research lies in the inclusion of the blue finance variable, which is an addition to previous studies (Kaddumi et al.,2023; Indrianti et al.,2022). Based on this phenomenon, motivation, and novelty, this study focuses on the themes of fintech adaptation, green finance, blue finance, digital transformation, and financial performance.

This research is based on several theories consisting of Stakeholder theory explains that a company is not an entity that operates solely for its own interests, but must also provide benefits to shareholders, suppliers, the government, society, and other parties (Freeman and Mcvea, 2005). As part of the financial sector, banks are known as institutions that comply with regulations and strive to continuously deliver benefits to their surrounding environment. This theory is used as the grand theory, serving as the main theoretical foundation for all research variables. The technology acceptance model (TAM) is a theory that relates to system resource usage, which largely depends on users trust in the system (Davis, 1987). The internal resources owned by a company can be optimized through the use of technology. The technology employed reflects the level of user trust in enhancing company performance. This theory is used as the middle theory to explain the variables of fintech and digital transformation. The ultimate goal of accounting practices is the evaluation of financial performance achievements, which is usually conducted periodically. Financial performance assessment is often linked to sustainability practices. A previous study by (Meiryani et al., 2024) linked financial performance with corporate social responsibility (CSR) and found a significant effect. Another study by (Kurniati et al., 2024) also showed significant influences of good corporate governance, company size, and company growth on financial performance. Green and blue finance represent financial contexts with specific purposes. Green finance was first introduced in the 2015 Paris Agreement in relation to the Sustainable Development Goals (Lisnawatiet al., 2021). Green finance is designed to support funding and financing that delivers environmental and social benefits (Wanta and Gunawan,

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2023). Meanwhile, blue finance or ocean finance, refers to financial activities that support the blue economy (March et al., 2024). Both types of finance are closely associated with projects that support terrestrial and marine environmental sustainability. Digital finance is a part of inclusive finance that enables the public to access financial services through electronic means and integration with information technology (Reza and Susanti, 2019). This form of digital finance requires time to fully transform, especially within the financial sector. Digital transformation greatly supports the acceleration of financial access for the public in real time. After the post-COVID period, the quality of bank financial reports improved along with the adoption of technology and the implementation of PSAK 71 (Jasman and Aminatunnaza 2023).

2. METHODS

The unit of analysis in this research is financial sector companies, specifically the banking sub sector, listed on the Indonesia Stock Exchange (IDX) for the period 2021-2023, with a total 0f 141 data observations. The independent variables in this study are digital transformation, green finance, and blue finance, while the dependent variable is financial performance. the measurement of each variable is explained in **Table 1**.

Tabel 1. Operational variables

Variable	*Operational Variable Definition*	*Indicator*	*Proxy*
Dependent Variable: *Financial Performance*	Financial Performance is a measure of how well a company manages its assets and liabilities to achieve its financial goals (Gupta and Sikarwar, 2016).	1. Operating profit after tax 2. total capital employed 3. weighted average cost capital	EVA = NOPAT – (TCE x WACC)
Independent Variable: *Fintech Adaptation*	Fintech Adaptation is the adoption of internet and computerized expansion in the financial services sector (Moufakkir and Mohammed, 2021)	1. Mobile Banking 2. ATM Banking 3. Agency Banking 4. Online Banking (Gikandi and Bloor, 2010)	$IFA_i = \sum_{i=1}^{n} \frac{X_{in}}{M_i}$
Independent Variable: *Green Finance*	Green Finance is financing projects that generate economic benefits while promoting environmental sustainability (Ozili, 2021)	1. Green Credit 2. Green long terms investment account 3. Carbon finance 4. Climate finance 5. Green traded stock and bond 6. green bancassurance 7. green infrastructural finance (Akomea-Frimpong et al., 2022)	$IGFi = \sum_{i=1}^{n} \frac{X_{in}}{M_i}$
Independent Variable: *Blue Finance*	Green Finance is the principle of financing and investment specifically for the financial community to ensure long-term benefits from ocean-related invesments without sacrificing the conservation and sustainable use of marine resources (Shiiba et al., 2022)	1. Microfinance model 2. Revolving loan fund 3. Bank loans 4. Conservation impact bond 5. Project bond 6. Sovereign bond (Shiiba et al., 2022)	$IBFi = \sum_{i=1}^{n} \frac{X_{in}}{M_i}$
Moderating Variable: *Digital Transformation*	The adoption of technologies, and its capabilities to digitize organizational assets (Kempegowda and Chaczko, 2018)	1. Artificial intelligence 2. cloud 3. cyber security 4. devices 5. internet of things (Verina and Titko, 2019)	$IDFi = \sum_{i=1}^{n} \frac{X_{in}}{M_i}$

Source: *Diolah penulis*

The analysis technique used is WRAP PLS. the empirical research model and the development of variable operationalization used to measure the research variables will be described below.

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$$FP_{i,t} = ß_0 + ß_1FA_{it} + ß_2GF_{it} + ß_3BF_{it} + ß_4FA*DT_{it} + ß_5GF*DT_{it} + ß_6BF*DT_{it} + e_{it} \ldots\ldots\ldots\ldots(1)$$

3. RESULTS AND DISCUSSION

The following **Table 2** presents the descriptive statistics results for the entire data in this study. The descriptive statistics results indicate that for all research variables, the mean values are above the standard deviation values. This implies that the entire data in this study is homogeneous, indicating a good representation of the overall data.

Table 2. Descriptive statistics

Variables	Mean	Median	Min	Max	Std.Dev
Fintech Adaptation	36.816	43.000	0.000	86.000	23.333
Green Finance	32.028	21.000	0.000	96.000	26.763
Blue Finance	2.660	2.000	1.000	6.000	1837
Digital Transformation	37.050	32.000	0.000	86.000	20.850
Financial Performance	236.007	139.000	8.000	1806	227.898

Source: WRAP PLS

Based on the descriptive analysis results in table above, it can be seen that the minimum value for each variable range between 0.000 and 1.000, while the maximum value is 96.000. these results indicate that there are still financial institutions that do not make disclosures, as indicated by the minimum value of 0.000 for the variables fintech, green finance, and digital transformation. The mean value for all variables is above the standard deviation, indicating that the data distribution is homogeneous, which is a good representation of the overall data.

Tabel 3. Hypothesis test result

FPi,t = ß0 + ß1FAit + ß2GFit + ß3BFit + ß4FA*DTit + ß5GF*DTit + ß6BF*DTit + eit

Variable	Direction prediction	Coefficienct	T-Statistic	P-Value
FA → FP	+	0,228	1,386	0,166
GF → FP	+	-0,004	0,026	0,979
BF → FP	+	0,264	1,782	0,075*
FA*DT → FP	+	-0,274	2,299	0,022**
GF*DT → FP	+	0,248	2,034	0,042**
BF*DT → FP	+	-0,077	0,623	0,533
R2	0,133			
* 0,1 **0,05				
Ket: FA (Fintech Adaptation), GF (Green Finance), BF (Blue Finance), DT (Digital Transformation), FP (Financial Performance).				

Source: WRAP PLS

Based on the results of the structural model testing, the regression results are as follows

FPi,t = ß0 + 0,228FA – 0,004GF + 0,264BF – 0,274FA*DT + 0,248GF*DT – 0,077BF*DT + e……(2)

The regression equation shows the coefficient values for each variable, indicating the direction of the influence. It can be seen that all variables have a positive direction except for the green finance variable, moderation 1, and moderation 2, which show a negative direction. Based on the statistical test results for the P-value, blue finance has a significantly positive effect on fintech

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adaptation. For the moderation variables, digital transformation can moderate (weaken) the effect of fintech adaptation on financial performance and can moderate (strengthen) the effect of green finance on financial performance.

3.1. The Influence of Fintech Adaptation on Financial Performance

Based on the results of the structural model test, a coefficient value of 0,228 was obtained with a p-value of 0,166>0,1 indicating that there is no significant influence of fintech adaptation on financial performance. therefore, hypothesis 1 is rejected, and the null hypothesis is accepted. This result shows that the presence of financial technology adaptation does not have an impact on financial performance. this occurs due to the gradual nature of fintech adaptation, both from the banking side as financial service providers and from the customer side as fintech users. Fintech adaptation requires long-term changes that often face challenges in altering consumer behaviour and existing financial infrastructure. This process can be time consuming and requires significant investment, thus contradicting previous research findings by (Wilter et al., 2023; Kaddumi et al., 2023) where in their study, fintech adaptation has an impact on financial performance.

These results do not support stakeholder theory, which suggests that companies should strive to maximize their resources to meet the demands of their stakeholders. Financial technology adaptation has become a general requirement from customers for financial institutions, making its implementation necessary across all areas. However, these findings indicate that no matter how extensive the technology adaptation efforts are they will not influence the increase in financial institutions profits.

The Technology Acceptance Model (TAM) theory states that the use of technology can enhance a company's performance. The higher the level of trust banks have in a particular system and technology, the more extensively it will be used. Therefore, these results are not aligned with the TAM theory. The limited impact of fintech on financial performance is mainly due to its early-stage implementation and the lack of integration of digitalization into core business operations. Another reason is the unrecognized cost efficiency from using fintech, making its financial impact not yet visible.

3.2. The influence of Green Finance on Financial Performance

Based on the results of the structural model test, a coefficient value of -0,004 was obtained with a p-value of 0,979 >0,1 indicating that there is no significant influence of the presence of green finance on financial performance. Therefore, hypothesis 2 is rejected, and the null hypothesis is accepted. This result shows that the existence of green finance does not impact financial performance in a negative direction, contradicting previous research findings by (Abuatwan, 2023; Chariri et al., 2018). The availability of financing dedicated to environmental themes, whether green or sustainable, is still limited and offered mainly by state-owned banks in Indonesia. Additionally, investments in green projects such as renewable energy or green infrastructure often require a long return on investment (ROI) period with substantial initial investments, where the results may not be immediately reflected in financial performance.

The presence of green finance supports stakeholder theory in terms of meeting regulatory demands, which have become mandatory under POJK 51 of 2017. Although initially, the lack of impact and the associated costs of green investments may not affect profitability growth in the short term, this situation is expected to reverse in the long term, clearly supporting stakeholder theory.

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3.3. The Influence of Blue Finance on Financial Performance

Based on the results of the structural model test, a coefficient value of 0,264 was obtained with a p-value of 0,075 < 0,1 indicating a significant influence of blue finance on financial performance. Therefore, hypothesis 3 is accepted and the null hypothesis is rejected. This result is consistent with the study by (Christiansen, 2023). Blue finance refers to financing aimed at enhancing the capital of micro, small, and medium enterprises, especially financing for fishermen, farmers, and the maritime trade sector. Microfinance is one of the most commonly expressed indicators of blue finance by banks. Investments in blue finance can yield positive long-term result on financial performance. These results support stakeholder theory because banks are making efforts to develop a set of policies that provide financing to the marine sector as a way to meet the demands of stakeholders.

3.4. Digital Transformation Moderates the Influence of Fintech Adoption on Financial Performance

Based on the result of the structural model test, a coefficient value of -0.274 was obtained with a p-value of 0.022 < 0.05, indicating that digital transformation is capable of moderating (weakening) the influence of fintech adoption financial performance. Therefore, hypothesis 4 is accepted, and the null hypothesis is rejected. This occurs due to the limitations in resources that companies have for massive digital transformation. The implementation of digital transformation often requires significant investments in technology, infrastructure, and human resources. As a result, companies may face resource constraints, both financially and in terms of personnel, making them less able to fully execute fintech adoption initiatives. This result aligns with research by Rehman and Hossain (2024); Wang and Du (2022); Lantip (2023).

These results support stakeholder theory as despite limited resources for fintech adaptation and gradual digital transformation, financial institutions continue to strive to meet stakeholder demands. Specifically, in relation to complying with BI regulations outlined in Bank Indonesia regulation N0.19/12/PBI of 2017. In addition to aligning with stakeholder theory, the results also support the Technology Acceptance Model (TAM). TAM explains that the technology used reflects the level of trust in the system as an effort to improve performance.

3.5. Digital Transformation Moderates the Influence of Green Finance on Financial Performance

Based on the results of the structural model test, a coefficient value of 0.248 and a p-value of 0.024 < 0.05 were obtained, indicating that digital transformation is capable of moderating the influence of green finance on financial performance. Therefore, hypothesis 5 is accepted, and the null hypothesis is rejected. This result is consistent with research by (Rehman and Hossain, 2024). The presence of digital transformation is often associated with short-term effects, while green initiatives are related to long-term effects. However, these two contexts can collaborate in the long run, highlighting the importance of organizational culture support in maximizing both concepts to complement each other. These results support stakeholder theory and technological acceptance model (TAM) theory, as they show financial institutions efforts to maximize environment financing to meet stakeholder demands.

3.6. Digital Transformation Moderates the Influence of Blue Finance on Financial Performance

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Based on the result of the structural model test, a coefficient value of -0.777 with a p-value of 0.533 was obtained, indicating that digital transformation cannot moderate the influence of blue finance on financial performance. Therefore, hypothesis 6 is rejected, and the null hypothesis is accepted. This result contradicts previous research by Xu and Liu (2023) and Matsunaga (2025). The main reason why digital transformation cannot moderate is the limited innovation and diversification in technology to support maritime concepts. Investment in blue finance can drive innovation in technology development and sustainable solutions for marine resource management. Diversifying portfolios towards sustainable businesses can also reduce long-term risks and enhance a company's resilience to economic and environmental changes. These results do not support stakeholder's theory and technological acceptance model (TAM) theory, which would suggest that digital transformation should enhance the impact of blue finance on financial performance due to the gradual nature of digital transformation processes

4. CONCLUSION

The results of this study indicate that the presence of digital transformation can only moderate the influence of digital adaptation and green finance on financial performance, while the rest do not. This is due to the limitations of digital transformation undertaken by companies, both in terms of resources and innovation and technology diversification. Regarding the influence test results, only blue finance has a positive effect on financial performance, while the rest do not support the hypotheses proposed. The practical implication of this research is the need to increase blue finance, as there are still few financing schemes offered by banks in Indonesia, despite the significant impact of blue finance on financial performance.

This study is limited in the implementation of blue finance, which is still very restricted, directly affecting the value of the blue finance indicator. The future research, the inclusion of control variables is necessary to eliminate research bias. Additionally, it is important to utilize blue finance indicators that are relevant to the sample implementation. In future research, control variables are needed to eliminate research bias. Additionally, it is important to use relevant blue finance indicators that align with the sample implementation. Recommendations for regulators, particularly the financial services authority (OJK) include the need for a taxonomy of green finance and blue finance as an initial step for implementation by banks. Additionally, separate regulations related to green finance and blue finance should be established.

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