

The Joint Effect of Corporate Social Responsibility and Digital Transformation on Bank Performance: Evidence from Vietnam's Banking Sector

Do Thi Mong Thuong

Faculty of Finance & Banking, University of Finance - Marketing, Ho Chi Minh City, Vietnam
ncs20100916@sv.ufm.edu.vn

Abstract. This study investigates the complex relationships among corporate social responsibility (CSR), digitalization, and bank performance in Vietnam from 2010-2022. Using a sample of 30 Vietnamese banks representing 97% of the banking sector's assets, we employ principal component analysis (PCA) to construct a comprehensive CSR index based on five stakeholder dimensions. Our findings reveal a U-shaped relationship between CSR and bank performance, with initial negative effects followed by positive impacts beyond a certain threshold. Digitalization investments show similar patterns, with short-term costs but long-term benefits when integrated with CSR initiatives. The study finds that large, state-owned, and listed banks benefit differently from CSR and digitalization investments. Additionally, bank characteristics such as size, credit risk, and ownership structure significantly moderate these relationships. The COVID-19 pandemic's impact on these relationships is also examined. Our findings contribute to stakeholder theory and provide practical implications for bank managers and regulators in emerging markets regarding optimal CSR and digital transformation strategies.

Keywords: CSR, digital transformation, bank performance, PCA, banking sectors and Vietnam.

1. Introduction

In recent decades, the global banking industry has witnessed two parallel strategic trends: corporate social responsibility (CSR) and digitalization (Forcadell et al., 2020, Yuen et al., 2022, Salah Mahdi et al., 2023). These trends not only reflect competitive pressures in an increasingly mature market but also result from societal and institutional demands to address environmental, social, and governance (ESG) issues. CSR has now moved beyond the traditional concept of philanthropy to become a key strategy to improve the image, increase public trust, and build sustainable brands for financial institutions. At the same time, digitalization has revolutionized the way banks operate, from implementing financial technology (fin-tech) to digital transformation to improve operational efficiency, expand the customer base, and reduce costs (Forcadell et al., 2020; Edwards et al., 2023).

However, banks are facing many major challenges. One of them is balancing the sustainability goals through CSR and the cost of investing in modern digital technology systems. According to Banktrack (2024), fossil fuel finance issues, climate change, and growing concerns about data privacy have placed more stringent demands on the global banking industry. At the same time, the COVID-19 pandemic has highlighted the important role of CSR in improving bank value and restoring public trust (Yuen et al., 2022, Bae et al., 2021). Simultaneously, technical advancements have expedited the transition from conventional banking to digital platforms (DeYoung et al., 2007, Le and Ngo, 2020b, Singh et al., 2022).

A significant issue in banking is information asymmetry, whereby the challenge of evaluating borrower quality (Dell'Ariccia, 2001) influences the risk level. In the digital era, banks may use big data to evaluate and forecast consumer behavior with greater precision, thereby mitigating information asymmetry and strengthening competitive advantage (Machkour and Abriane, 2020). Digitalization enables banks to decrease expenses and enhance financial performance by broadening their client base (Acharya et al., 2008, Le et al., 2022b). This approach may be expensive initially owing to the expenses related to new personnel and systems (Nguyen et al., 2023) and also entails data security concerns (Flyverbom et al., 2017). Moreover, the accessibility of client data may pose opportunistic risks and harm the reputations of banks (Granados and Gupta, 2013; Hoepner et al., 2016). CSR may address these deficiencies, while simultaneously enhancing trust and alleviating the dangers associated with digitalization (Forcadell et al., 2020).

The literature shows mixed findings. While digitalization is thought to enhance bank performance (Nguyen et al., 2023, Theiri and Hadoussa, 2023, Bian et al., 2023) and mitigates bank risks (He et al., 2023), some research indicates adverse effects (Guo et al., 2022). The influence of CSR on bank performance has also been contentious (Shen et al., 2016, Neitzert and Petras, 2022, Soana, 2011). The uneven outcomes generate apprehensions over the ability of commercial banks to simultaneously implement both CSR and digitization plans, particularly within developing economies.

Vietnam, a developing economy in Southeast Asia, stands out as a case study to examine the relationship between CSR, digitalization, and banking performance. With an average GDP growth rate of 6.10% during 2010–2022 (WB, 2023), Vietnam is considered one of the new “economic dragons” in the region. Despite the impact of the COVID-19 pandemic, Vietnam’s economy has maintained an impressive growth rate of 4.51% in 2020 thanks to effective government support programs and a stable financial system (ADB, 2020, Le et al., 2024c). Vietnam’s banking system includes both state-owned (SOCB) and private commercial banks (POCB), with the increasing participation of international organizations after joining the WTO in 2007 (Le et al., 2019).

Notably, the Vietnamese government has issued many policies to encourage CSR and digitalization in the banking sector. Regulations such as Decision 999/2019/QD-TTg on fintech piloting and Decree 80/2016/ND-CP on electronic payments have facilitated the development of financial technology. At the same time, the State Bank of Vietnam (SBV) has also implemented initiatives to promote green development and manage environmental and social risks, such as Decision 1552/QD-NHNN and Directive 03/CT-NHNN (SBV, 2015a; 2015b). However, there is still a lack of specific guidelines on

the application of CSR in the banking sector, leading to uneven implementation across organizations. This raises important questions about the effectiveness of CSR when implemented concurrently with digitalization strategies.

Although there are many international studies focusing on the impact of CSR and digitalization on banking performance, the results are quite contradictory. Some studies indicate that digitalization improves financial performance and reduces risks (Nguyen et al., 2023; He et al., 2023), while others warn of negative impacts such as high initial investment costs and data security risks (Guo et al., 2022). Similarly, studies on the impact of CSR are also mixed, with some concluding that CSR improves performance and reduces risks, but others showing insignificant or even negative impacts (Shen et al., 2016; Neitzert and Petras, 2022; Soana, 2011). These results are particularly worrying in developing countries like Vietnam, where banks face limited resources and management capacity.

Based on the above gaps, this paper raises the following research questions: (i) how does the relationship between CSR and digitalization affect banking performance in Vietnam? (ii) How do ownership characteristics (state-owned vs. private banks) and listing status affect this relationship? (iii) Does the COVID-19 pandemic change the way CSR and digitalization affect banking performance?

This paper contributes to the research field in three main aspects. First, from a theoretical perspective, the paper builds a theoretical framework linking CSR, digitalization, and banking performance, especially in the context of developing economies. CSR is measured based on stakeholder theory and using the quantitative method of Zhou et al. (2021) on banks in China, and the author has refined and supplemented the calculation of stakeholder components to comply with Vietnamese law, instead of limited measurement methods such as charitable contributions or simple ESG index (Nguyen and Nguyen, 2021; Tan, 2017). Using principal component analysis (PCA) to construct the CSR index, the paper overcomes the limitations of previous studies, ensuring higher representativeness and accuracy. Finally, the research results provide important information for managers and policy makers in Vietnam in building an integrated strategy between CSR and digitalization. Recommendations focus on resource optimization, risk management and sustainable development in the banking sector.

Simultaneous implementation of CSR and digitalization is an inevitable strategy for the banking industry in the era of sustainable development and digitalization. In the context of Vietnam, where the legal environment and implementation capabilities are still limited, this paper brings a new perspective, providing empirical evidence on the complex relationship between CSR, digitalization and banking performance. These contributions are not only meaningful in the national context but can also be extended to other emerging markets.

The rest of the study is organized as follows: Part 2 provides a literature review, and Part 3 presents the methodology and data. Part 4 discusses empirical findings, while Part 5 concludes.

2. Literature Review

The theoretical basis for this study is based on Stakeholder Theory, introduced by Freeman (1984), which argues that businesses need to balance the interests of stakeholders such as customers, shareholders, employees, governments, social and environment. In the banking context, corporate social responsibility (CSR) helps build trust with customers and stakeholders, especially when combined with digitalization – a strategic tool to improve efficiency and reduce information asymmetry (Forcadell et al., 2020). CSR and digitalization are not only independent tools but can also complement each other, creating a synergistic effect on banking performance. However, current studies are limited in examining this combination, especially in emerging markets during the crisis period.

2.1. Digitalization and bank performance

In recent years, there has been a growing interest among researchers and managers in the influence of green investment technology (GIT) on bank performance (BP) (Appiahene, Missah, & Najim, 2019; Dincer & Yüksel, 2020). Early research concentrated on the transformations that financial technology

(fintech) brought about, in which technology companies offered bank-like services through digital platforms, thereby progressively challenging the role of banks as payment intermediaries. These studies have demonstrated the substantial influence of fintech on bank BP (De Roure, Pelizzon, & Thakor, 2021; L. Nguyen, Tran, & Ho, 2021; T.-P. Wu, Wu, Liu, Hsueh, & Wang, 2020; Z. Zhang, Hu, & Chang, 2019). Furthermore, numerous other studies concentrate on the internal digitalization initiatives of banks in order to improve operational processes and mitigate environmental impacts. These initiatives include the automation of approvals, the utilization of electronic documents, and the implementation of digital signature systems.

Several studies have demonstrated that technology investments can reduce banking costs, increase managerial efficiency, and increase profitability (Berger & DeYoung, 2006; Simper, Dadoukis, & Bryce, 2019). For example, Berger (2003) argues that IT investments help US banks reduce agency costs and improve access to services. However, other studies have found no clear link between technology investments and bank performance, especially in studies of Spanish banks from 1983 to 2003 (Beccalli, 2007; Martín-Oliver & Salas-Fumás, 2008). These results suggest that, although technology investments can increase productivity, they do not necessarily lead to higher financial performance.

Furthermore, the majority of current research has overlooked the impact of CSR on BP in conjunction with technological investment. According to (Aguinis, 2011), CSR encompasses a range of business obligations to stakeholders, including economic, social, and environmental dimensions. Investment in technology, seen as a component of CSR, seeks to mitigate environmental consequences by decreasing hazardous emissions and conserving resources (Rupp, 2011). Moreover, technology enhances the efficiency of financial transactions and ensures compliance with governmental digitization mandates. This might affect the correlation between CSR and BP, particularly when banks implement digital services like online transactions, mobile banking, and internal automation procedures.

In the context of emerging markets like Vietnam, the process of digitalization of banks is taking place rapidly. However, the lack of specific indicators for evaluating digitalization and BP has made many research results uncertain. Therefore, instead of relying on general indicators, this study proposes using an index of actual costs that banks have to bear when investing in technology and software to promote digitalization. This index utilizes the research of (Nguyen-Thi-Huong, Nguyen-Viet, Nguyen-Phuong, & Van Nguyen, 2023), and use the stochastic frontier technique (SFA) (Harjoto & Laksmana, 2016) to evaluate the technological gap, therefore offering a more objective measure of operational efficiency.

Moreover, the study also examines the non-linear mediating relationship between digitalization and CSR with BF. Many previous studies have focused only on the relationship between CSR and BP without analyzing this non-linear relationship in depth. The uncertainty in the results may stem from ignoring the short-term and long-term effects of CSR on BP (Ferrell et al., 2016; Hillman & Keim, 2001). Horváthová (2010) suggests that these confounding results may be due to insufficient sample size, or inconsistent measurement of important variables. Therefore, this study will investigate whether there is a non-linear relationship between CSR and BP, especially in the context of digital banking in Vietnam. In addition, the study also examines whether the standards of the 2016 GRI Guidelines are suitable for the banking industry, and constructs a CSR index using the PCA method (Zhou et al., 2021) to determine the proportion of each CSR component. Finally, the study uses the SFA method to calculate the financial stability performance index integrating CSR in the model, providing a more comprehensive and objective approach than traditional measures.

In summary, recent studies have focused on the role of digitalization in improving banking performance. Many studies have shown that investing in technology can reduce operating costs, improve productivity, and increase profitability (Berger & DeYoung, 2006; Simper et al., 2019). In emerging markets such as Vietnam, digitalization helps banks improve their customer reach through

services such as e-banking and mobile payments (Nguyen et al., 2023). At the same time, the adoption of technological tools such as e-signatures and automation of approval processes can reduce environmental impacts, which is in line with CSR goals (Rupp, 2011). However, some studies have suggested that technology investments do not necessarily lead to higher financial performance. Beccalli (2007) shows that, in the Spanish banking context, technology investments do not significantly improve financial performance. This raises the question of whether factors such as managerial capacity, start-up costs, and measurement heterogeneity may influence the results (Martín-Oliver & Salas-Fumás, 2008).

2.2. CSR and bank performance

The connection between CSR and bank performance (BP) has garnered scholarly interest since the 1970s, however it remains contentious. Numerous studies indicate that CSR positively influences business financial performance, including findings from Forcadell, Aracil, and Úbeda (2020), Maqbool and Zameer (2018), and Orlitzky et al. (2003) demonstrating substantial financial advantages associated with CSR (Forcadell, Aracil, & Úbeda, 2020; Maqbool & Zameer, 2018; M. Orlitzky, Schmidt, F. L., & Rynes, S. L., 2003; Simpson, 2002). Wang and Sarkis (2017) emphasize that companies who effectively execute CSR management, particularly in the “green” sector, have enhanced overall BP. Likewise, Platonova et al. (2018) discovered a favorable correlation between CSR disclosure and the BP of Islamic banks. Furthermore, Kim et al. (2018) contended that corporate social responsibility significantly enhances business performance, particularly in a highly competitive landscape. These studies demonstrate that CSR enhances societal image and positively influences company performance and competitiveness, particularly within the financial sector (Z. Wang & Sarkis, 2017; Platonova, Asutay, Dixon, & Mohammad, 2018; Kim, Kim, & Qian, 2018; Maqbool & Zameer, 2018).

However, there are also opposing views. Some scholars such as Brammer, Pavelin, and Porter (2006) argue that CSR can reduce BP. Esteban-Sanchez et al. (2017) found a negative impact of CSR on BP, especially during the 2008 global financial crisis. Price and Sun (2017) also argued that firms with low CSR engagement have better BP because CSR can increase operating costs without providing commensurate financial benefits (Price & Sun, 2017). Other studies have shown a U-shaped relationship between CSR and BP, suggesting that firms with low environmental performance tend to have negative BP, while those with high environmental performance have positive BP (Barnett & Salomon, 2012; S. Brammer & Millington, 2008). Trumpp and Guenther (2017) found a U-shaped relationship between carbon efficiency and profitability, and between waste intensity and profitability, suggesting a complex relationship between CSR and financial performance (Trumpp & Guenther, 2017).

Some other scholars argue that CSR does not have a significant impact on bank performance. McWilliams and Siegel (2001) as well as Newell and Lin Lee (2012) argue that CSR may have different impacts depending on each firm’s strategy, but there is no direct and significant relationship with business performance (McWilliams & Siegel, 2001; Newell & Lin Lee, 2012). Theodoulidis et al. (2017) also found that CSR does not have a clear financial effect but only an indirect effect through factors such as customer satisfaction and institutional management environment (Theodoulidis, Diaz, Crotto, & Rancati, 2017). These results indicate that an effective institutional environment can enhance the impact of CSR on customer satisfaction, thereby indirectly affecting business performance (Xie, Jia, Meng, & Li, 2017). Research by Hussain, Rigoni, and Cavezzali (2018) demonstrates that although sustainable development indicators have different impacts on HRD, the overall impact of sustainable development on HRD is insignificant (Hussain, Rigoni, & Cavezzali, 2018).

The aforementioned discussions indicate that the link between CSR and corporate governance is intricate and lacks a definitive agreement. A primary reason for this is because several previous research overlook the differentiation between short-term and long-term effects of CSR. In the near term, banks may face substantial expenses to execute CSR, particularly if they excessively spend in these initiatives, thereby adversely affecting corporate governance (Hillman & Keim, 2001). In the long run, CSR may provide several advantages, such as enhanced relationships with governments, workers, shareholders,

and consumers. For instance, CSR may assist banks in cultivating durable connections with governments, therefore obtaining essential policy support (Waddock & Graves, 1997). Moreover, CSR may augment staff loyalty, bolster shareholder trust, and elevate consumer pleasure, thus facilitating the bank's long-term growth.

In summary, the relationship between CSR and BP is a complex and controversial topic, depending on many factors such as economic context, corporate strategy and the timing of CSR implementation. In the short term, CSR may increase costs and put pressure on performance, but in the long term, the social and financial benefits that CSR brings can significantly contribute to the sustainable development of banks (Ferrell, Liang, & Renneboog, 2016).

2.3. The effect of digitalization and CSR on bank performance

As mentioned above, research has shown inconclusive data on the direct influence of digitalization and CSR on banking performance. Forcadell et al. (2020) contend that digitization and CSR might mitigate information asymmetry on both the banking side, facilitated by digitalization, and the consumer side, enhanced by the sustainability of CSR, thereby boosting economic and market performance. When combined, these two elements can create a synergistic effect, improving operational efficiency and sustainability. However, empirical studies on this synergy are limited, especially in emerging markets like Vietnam, where CSR and digitalization are in the early stages of implementation. Digitalization enables banks to gather and analyze substantial volumes of client data, conferring a competitive edge. This also introduces possible risks regarding privacy and information security (Helbing, 2015). Su et al. (2016) assert that corporate social responsibility (CSR) may significantly mitigate issues associated with information asymmetry. Through Corporate Social Responsibility, banks may convey favorable non-financial signals that assist stakeholders in anticipating the bank's future conduct, therefore enhancing confidence and mitigating issues around information asymmetry. Consequently, CSR may function as a reputation-oriented solution to mitigate the information asymmetry issue resulting from digitization (Forcadell et al., 2020).

This study fills this gap by analyzing the nonlinear impact of CSR and digitalization on bank performance. Using stakeholder theory and principal component analysis (PCA), this study constructs a comprehensive CSR index, overcoming the limitations of previous studies (Zhou et al., 2021). At the same time, the stochastic frontier method (SFA) is applied to measure financial performance more objectively, providing a new perspective on the impact of digitalization and CSR.

Based on the theoretical and empirical review, this research develops the following hypotheses:

H1: The combination of CSR and digitalization has no impact on the performance of banks.

Due to the mixed impact of CSR components on bank performance as discussed in Section 2.2, the second hypothesis is formulated as follows:

H2: The combination of CSR components and digitalization has no impact on the performance of banks.

3. Methodology

3.1. Methodology

Following Platonova *et al.* (2018), the baseline model is formed as follows.

$$\pi_{i,t} = \alpha + \beta_1 CSR_{i,t} + \beta_2 SQCSR_{i,t} + \beta_3 X_{i,t} + \varepsilon_i \quad (1)$$

Following Zhou et al. (2021), the interaction model is formed as follows.

$$\pi_{i,t} = \alpha + \beta_1 CSR_{i,t} + \beta_2 SQCSR_{i,t} + \beta_3 CSR_{i,t} * GIT_{i,t} + \beta_4 X_{i,t} + \varepsilon_i \quad (2)$$

Bank performance ($\pi_{i,t}$) can be measured by return on assets (ROA) and net interest income (NIM) (Le, 2018).

Corporate social responsibility (CSR) variable is built based on the principles of stakeholder theory. The author classifies stakeholders into five distinct components. Stakeholders include shareholders, employees, consumers (including depositors and lenders), government and society. The author uses several indicators to evaluate these components for different stakeholders. Specific information is provided in table 9.

CSR is constructed based on the principles of stakeholder theory. We categorize stakeholders into five distinct components. The stakeholders include shareholders, workers, consumers (including depositors and lenders), government, and society. The author employs several indicators to assess these components for various stakeholders. The specific information is provided in table 1.

Table 1: Aspects that affect the social responsibility of banks.

Index	Variable	Calculation
Shareholder (SHR)	Dividend payment rate	Dividend payment rate/ EPS
Employee (EMP)	Employee expense ratio	Employee expense/ total income
Customers (CUS)	Mobilization and lending expenses ratio	Expenses related to interest activities on total income
Government	Tax expense ratio and interest rate support	Tax payment amount and interest subsidy amount on total income
Environment and Social (ESOC)	Proportion of welfare contributions to the environmental and social community through charity programs and social activities	Community contributions on total income

Source: Adapted from Zhou et al. (2021)

The majority of previous research has employed content analysis and ranking indexes to quantify CSR. Apply the un-weighted measure method (Horváthová, 2010) in order to determine the overall CSR score. Nevertheless, these approaches are largely subjective, susceptible to the impact of subjective elements, and insufficiently objective. Principal component analysis is utilized to calculate the proportions of components that influence CSR in order to circumvent this limitation. Principal component analysis is an empirical data-driven one-dimensional statistical reduction technique. Principal component analysis will therefore be more objective. The weight assigned to each indicator in this study is determined by the information it comprises. This purpose may be achieved by using principal component analysis, which involves the following steps: (i) determining the weight of each index using principal component analysis; and (ii) assigning weights to the findings obtained from principal component analysis.

First, the main weight model is determined according to the following formula

$$\begin{aligned}
 F_1 &= f_{11}x_1 + f_{12}x_2 + \dots + f_{1n}x_n \\
 F_2 &= f_{21}x_1 + f_{22}x_2 + \dots + f_{2n}x_n \\
 F_m &= f_{m1}x_1 + f_{m2}x_2 + \dots + f_{mn}x_n \quad (5)
 \end{aligned}$$

F_1, F_2, \dots, F_m represent the m principle components obtained from principal component analysis; f_{ij} represents the initial factor loadings; and x_i stand for the i^{th} standardized index.

Second, the original coefficients are transformed into a coefficient decision matrix:

$$u_{ij} = f_{ij} / \sqrt{\lambda_j} \quad (6)$$

In which, u_{ij} represents the choice matrix coefficient; f_{ij} is the starting coefficient, λ_j presents the characteristic solution of the j equation components.

$$F_z = \sum_{j=1}^m (\lambda_j/k)F_j = a_1x_1 + a_2x_2 + \dots + a_nx_n \quad (7)$$

$$k = \lambda_1 + \lambda_2 + \dots + \lambda_n \quad (8)$$

In conclusion, the calculation for the weight of each index is as follows:

$$w_i = a_i / \sum_{i=1}^m a_i \quad (9)$$

Table 2: The results of analyzing the main components of the bank’s social responsibility

Variable	Comp.1	Comp.2	Comp.3	Comp.4	Comp.5
SHR	0.0434	0.7373	-0.1186	0.6635	0.0146
EMP	0.4559	-0.4688	0.3121	0.5375	0.4313
CUS	-0.6888	0.0290	0.0427	0.0045	0.7231
GOV	0.5536	0.2972	-0.3478	-0.4406	0.5387
ESOC	0.0970	0.3838	0.8751	-0.2771	0.0269
Eigenvalue	1.9104	1.2340	0.9738	0.7082	0.1734
Proportion	0.3821	0.2468	0.1948	0.1416	0.0347

From the results of Table 2 on the individual values of each component 1 to 5, continue to use equations (7), (8) and (9) according to the PCA method to calculate the density for each component. The results are presented in table 3 as below.

	Eigenvalue
comp1	1.91042
comp2	1.23407
comp3	0.973817
comp4	0.708249
comp5	0.17345
Sum	5.000006

Noted: the results of table 2

Table 3: Weight of each component

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Fz	weight
SHR	0.0434	0.7373	-0.1186	0.6635	0.0146	0.26995	23.69%
EMP	0.4559	-0.4688	0.3121	0.5375	0.4313	0.21037	18.46%
CUS	-0.6888	0.029	0.0427	0.0045	0.7231	-0.22198	19.48%
GOV	0.5536	0.2972	-0.3478	-0.4406	0.5387	0.173413	15.22%
ESOC	0.097	0.3838	0.8751	-0.2771	0.0269	0.263908	23.16%

Table 3 is presented the calculation results showing that the allocation ratio among shareholders, employees, customers, government, society, community and environment are 23.68%, 18.46%, 19.48%, 15.22%, and 23.16 % accordingly. The weights indicate that the most important factor is the proportion of shareholders in commercial banks. This suggests that if banks prioritize their objectives, they will fulfill around one-third of their societal obligations. Furthermore, the personnel of commercial banks have paramount significance. Given that banks are financial institutions and sectors with low asset intensity, their most valuable resources are their workers. Hence, the organization's obligation towards its workers has great significance. Moreover, depositors and lenders of a bank have higher significance. This is because the primary method by which banks generate profits is via the acquisition of deposits

and subsequent lending activities. In the grand scheme of things, the government has the least amount of influence among all stakeholders. Noncompliance with business income tax is obligatory. The CSR weighting among various stakeholders listed above is both practical and persuasive. Based on these weights, this research establishes a social responsibility index for commercial banks in Vietnam.

Explanatory variables (X) is presented by as below

Following Ngo and Le (2022b), the author uses GIT, the ratio of amount green investment technology on total assets as proxies. Regarding the bank-specific characteristics, we control for bank property: bank size ($LnBranch$), non-performing loan ratio (NPL); cost to income ratio (CIR); Total assets growth ($TAGr$); ownership of state-owned commercial banks ($SOCB$), banks listed on the stock exchange ($Listed$), Basel application ($BASEL2$), and CEO gender ($CEOGEN$). In which, $LnBranch$ is the natural logarithm of total numbers of branches at the banks; NPL , non-performing loan ratio; CIR , The ratio of operating expenses to total revenue of bank i at year t (Berger and DeYoung, 2001, Le, 2021, Sathye and Sathye, 2017). $SOCB$ is a dummy variable, equal to 1 if the bank is state-owned and 0 otherwise (Avkiran, 2011, Ho *et al.*, 2021b). $TAGr$ is measured by the growth rate of assets of bank i at year t compared to year $t-1$ (Zhou *et al.*, 2021). $Listed$ is a dummy variable, equal to 1 if the bank is listed on the stock exchange and 0 otherwise (Avkiran, 2011, Ho *et al.*, 2021b); $Basel2$ is a dummy variable, equal to 1 if the bank applies Basel 2 regulations and 0 otherwise (Avkiran, 2011, Ho *et al.*, 2021b); $COVID$, a dummy variable that takes a value of 1 for the years 2020-2022, and 0 otherwise; $CEOGen$ is a dummy variable, equal to 1 if the bank's CEO is female and 0 otherwise (Avkiran, 2011, Ho *et al.*, 2021b); $AUDIT4$ is a dummy variable that takes a value of 1 for a bank's financial statement that is audited by one of the four largest public accounting firms, and 0 otherwise (Avkiran, 2011, Ho *et al.*, 2021b);

Regarding macroeconomic characteristics, the author uses the variable GDP growth rate (GDP) in year t compared to year $t-1$ and inflation rate (INF) as proxies.

To address the endogeneity concerns between CSR, digitalization, and bank performance, this research applies an instrumental variable approach such as the ratio of CSR spending by banks in the region or related industry to minimize the endogeneity effect.

To check the stability of the results, this research conducts robustness tests, the study used multiple steps of testing. First, the author uses the dependent variable NIM to replace ROA. Then, continue to test the model according to the characteristics of the banks such as size, ownership form, listed on the stock exchange and unlisted on the stock exchange. Finally, test during the Covid-19 pandemic period.

To ensure that there is no multicollinearity between the independent variables, this research applies measures such as the Variance Inflation Factor (VIF) test. Eliminate variables with $VIF > 4$ to ensure independence between variables and analyze the correlation matrix to assess the level of correlation between independent variables to check the stability of the model, eliminate variables with correlation greater than 0.9.

3.2. Data

This research collected 30 Vietnamese commercial banks from 2010 to 2022, which accounts for more than 97% of the total assets of the banking industry. Most of the bank-specific information is taken from the Vietnamese banking database, which we collect from banks' financial statements and annual reports published annually by banks.

4. Results and Discussion

4.1. Descriptive statistics

Table 4: Descriptive statistics of variables used in our analysis

Variables	Obs	Mean	Std. Dev.	Min	Max
ROA	390	1.043	0.912	-4.209	4.688
NIM	390	4.529	0.984	0.305	5.649
CSR	390	15.283	2.251	7.616	25.925
GIT	390	0.303	0.215	0	1.123
LnBranch	390	5.099	0.956	2.079	7.783
NPL	390	1.916	1.287	-2.033	14.72
CIR	390	83.842	13.067	4.079	142.683
TAGr	390	17.095	26.946	-53.599	140.623
SOCB	390	0.133	0.34	0	1
LIST	390	0.633	0.482	0	1
COVID	390	0.148	0.356	0	1
BASELII	390	0.184	0.388	0	1
AUDIT4	390	0.612	0.487	0	1
CEOGEN	390	0.848	0.358	0	1
GDP	390	6.101	1.584	2.561	8.02
INF	390	5.324	4.599	0.631	18.677

Notes: ROA, return on assets; NIM, net interest income; *NIM*, net interest income; CSR, a bank's corporate social responsibility index; GIT, the ratio of amount green investment technology on total assets; *LnBranch*, the natural logarithm of total numbers of branches at the banks; NPL, non-performing loan ratio; *CIR*, The ratio of operating expenses to total revenue; *TAGr* is measured by the growth rate of assets of bank *i* at year *t* compared to year *t-1*; SOCB, a dummy variable that takes a value of 1 for a state-owned commercial bank and 0 otherwise; LIST, a dummy variable that takes a value of 1 for a listed bank, and 0 otherwise; COVID, a dummy variable that takes a value of 1 for the years 2020-2022, and 0 otherwise; BASELII is a dummy variable that takes a value of 1 if a bank comprehensively adopts the Basel II framework, and 0 otherwise; AUDIT4 is a dummy variable that takes a value of 1 for a bank's financial statement that is audited by one of the four largest public accounting firms, and 0 otherwise; CEOGEN, a dummy variable that takes a value of 1 for a male CEO, and 0 otherwise; GDP, the annual economic growth rate; INF, inflation rate;

Source: Authors own creation

Table 4 presents descriptive statistics of the variables used in the analysis. The results show that the average return on assets (ROA) of the banks is 1.043%, with a standard deviation of 0.912%, reflecting significant differences in operating efficiency among the banks. The average net interest margin (NIM) is 4.529%, with a minimum value of 0.305% and a maximum of 5.649%, indicating the efficiency in managing earning assets.

The average CSR index is 15.283, with a standard deviation of 2.251, reflecting significant differences in the implementation of social responsibility among the banks. The average investment rate in green technology (GIT) is 0.303%, with a maximum of 1.123%, demonstrating the efforts of the banks in digitalization and enhancing environmental responsibility.

In terms of bank characteristics, the average number of branches (*LnBranch*) is 5,099, with an average non-performing loan (NPL) ratio of 1,916%, indicating that credit risk is manageable. The average CIR (cost-to-income ratio) is 83,842%, reflecting the efficiency in controlling operating costs. Dummy variables such as SOCB (13.3% state-owned banks), LIST (63.3% listed banks), COVID (14.8% observations for the period 2020–2022), and BASELII (18.4% banks applying Basel II) provide additional information on the specific characteristics of the sample. In addition, the average GDP is

6,101% and the average inflation rate (INF) is 5,324%, reflecting the macroeconomic context of Vietnam during the study period.

4.2. The results of the baseline model

Table 5 Correlation matrix between variables

Variables	ROA	NIM	CSR	GITR	LnBranch	NPL	CIR	TAGr	SOCB	Listed	Covid
ROA	1										
NIM	0.454***	1									
CSR	-0.469***	0.276***	1								
GITR	0.242***	0.098*	-0.355***	1							
LNBranch	0.053	0.163***	-0.117**	-0.184***	1						
NPL	-0.179***	0.002	0.127**	-0.040	0.022	1					
CIR	-0.817***	0.250***	0.499***	-0.321***	-0.063	0.215***	1				
TAGr	-0.035	-0.013	-0.048	-0.032	-0.100**	0.013	0.014	1			
SOCB	-0.073	-0.042	0.040	-0.141***	0.423***	-0.034	-0.023	-0.042	1		
Listed	0.226***	0.198***	-0.208***	-0.020	0.300***	-0.138***	-0.256***	0.015	0.095*	1	
Covid	0.073	0.055	0.239***	0.077	0.081	-0.059	0.106**	-0.005	0.005	-0.011	1
Large	0.150***	0.092*	0.292***	-0.047	0.635***	-0.101**	0.214***	-0.043	0.330***	0.438***	0.162***
BaselII	0.221***	0.148***	0.313***	0.162***	-0.060***	-0.057	0.227***	0.027	0.066	0.362***	0.024
Audit4	0.203***	0.300***	0.291***	0.095*	0.307***	-0.091*	0.227***	0.039	0.110**	0.542***	0.006
CEOGen	0.097*	0.135***	-0.122**	-0.037	0.278***	-0.002	0.121**	0.081	0.165***	0.302***	-0.064
GDP	-0.046	-0.058	0.062	-0.067	-0.025	-0.005	0.029	-0.005	-0.002	0.004	-0.894***
INF	0.079	0.084*	0.349***	-0.133***	-0.104**	0.034	0.108**	0.150***	-0.001	0.002	-0.254***

Notes: ROA, return on assets; NIM, net interest income; *Fz* - score, the value of a bank's forward-looking Z-score; CSR, a bank's corporate social responsibility index; GITR, green investment technology ratio; LnBranch, the natural logarithm of total numbers of branches at the banks; NPL, non-performing loan ratio; CIR, The ratio of operating expenses to total revenue; TAGr is measured by the growth rate of assets of bank *i* at year *t* compared to year *t-1*; SOCB, a dummy variable that takes a value of 1 for a state-owned commercial bank and 0 otherwise; LIST, a dummy variable that takes a value of 1 for a listed bank, and 0 otherwise; COVID, a dummy variable that takes a value of 1 for the years 2020-2022, and 0 otherwise; BASELII is a dummy variable that takes a value of 1 if a bank comprehensively adopts the Basel II framework, and 0 otherwise; AUDIT4 is a dummy variable that takes a value of 1 for a bank's financial statement that is audited by one of the four largest public accounting firms, and 0 otherwise; CEOGEN, a dummy variable that takes a value of 1 for a male CEO, and 0 otherwise; GDP, the annual economic growth rate; INF, inflation rate;

Table 5 provides the correlation matrix between variables, showing that no pair of variables has a correlation coefficient exceeding 0.9, confirming that there is no serious multicollinearity. The main variables such as CSR, GITR, and ROA show significant correlations. CSR is negatively correlated with ROA (-0.469, $p < 0.01$), while GITR is positively correlated with ROA (0.242, $p < 0.01$), reflecting the role of green technology in improving operational efficiency. CSR is also negatively correlated with CIR (0.499, $p < 0.01$), indicating the relationship between social responsibility and cost control. Notably,

variables such as Basel II and Audit4 are positively correlated with ROA (0.221 and 0.203, $p < 0.01$), suggesting that the adoption of international standards and transparent financial reporting can improve banking performance. The COVID variable is negatively correlated with CSR (-0.239, $p < 0.01$), reflecting a decrease in investment in CSR during the pandemic period.

Table 6: VIF test

Variables	CSR	SHR	EMP	CUS	GOV	ESOC
CSR/ CSR's components	1.98	1.21	1.63	2.55	1.69	1.13
GITR	1.33	1.26	1.28	1.36	1.26	1.26
LnBranch	1.61	1.62	1.70	1.60	1.60	1.61
NPL	1.09	1.09	1.11	1.09	1.10	1.09
CIR	1.49	1.32	1.32	1.74	1.64	1.32
TAGr	1.07	1.07	1.06	1.06	1.07	1.06
SOCB	1.28	1.29	1.27	1.27	1.27	1.36
LIST	1.79	1.80	1.84	1.79	1.79	1.81
BASELII	1.35	1.28	1.30	1.35	1.29	1.31
AUDIT4	1.62	1.60	1.59	1.72	1.61	1.58
CEOGEN	1.25	1.25	1.25	1.26	1.25	1.25
Mean VIF	1.44	1.34	1.39	1.52	1.41	1.34

Notes: ROA, return on assets; NIM, net interest income; Fz - score, the value of a bank's forward-looking Z-score; CSR, a bank's corporate social responsibility index; GITR, green investment technology ratio; LnBranch, the natural logarithm of total numbers of branches at the banks; NPL, non-performing loan ratio; CIR, The ratio of operating expenses to total revenue; TAGr is measured by the growth rate of assets of bank i at year t compared to year $t-1$; SOCB, a dummy variable that takes a value of 1 for a state-owned commercial bank and 0 otherwise; LIST, a dummy variable that takes a value of 1 for a listed bank, and 0 otherwise; COVID, a dummy variable that takes a value of 1 for the years 2020-2022, and 0 otherwise; BASELII is a dummy variable that takes a value of 1 if a bank comprehensively adopts the Basel II framework, and 0 otherwise; AUDIT4 is a dummy variable that takes a value of 1 for a bank's financial statement that is audited by one of the four largest public accounting firms, and 0 otherwise; CEOGEN, a dummy variable that takes a value of 1 for a male CEO, and 0 otherwise; GDP, the annual economic growth rate; INF, inflation rate;

The VIF test results of Table 6 show that all VIF values are below 2.55, with the average VIF being 1.44, confirming that there is no multicollinearity in the model. The CSR variable and its components, as well as GITR and control variables such as LnBranch and CIR, all have low VIF levels, ensuring the stability and reliability of the regression estimates.

Table 7: The results of diagnosis tests

Diagnosis tests	Results	Conclusions
F test	$F(10, 328) = 17.86^{***}$	Pooled OLS is more appropriate than REM
Breusch and Pagan test	$\text{chibar}2(60) = 106.73^{***}$	FEM is more appropriate than REM
Hausman test	$\chi^2(9) = 572.10^a$	Pooled OLS is more appropriate than FEM

Notes: *** denotes for statistical significance at the 1% level. ^a p-value is greater than 0.05

We first run our baseline model to examine the most appropriate method. We infer that OLS is the most suitable model for this study using three diagnostic tests, including the F-test, Breusch-Pagan, and Hausman tests. However, the p-value of the Wald test was less than 0.05, demonstrating that the variance has changed. Therefore, OLS with robust standard errors is used to overcome heteroskedasticity. Also, including the fixed effects model prevents us from testing the effect of bank characteristics.

Table 8 indicates that CSR adversely affects bank performance, shown by a coefficient of -0.328 and a significance level of 5%. The influence is favorable when examining the square of CSR (coefficient of 0.809, p -value < 0.05), suggesting a nonlinear link between CSR and bank performance. The implementation of corporate social responsibility (CSR) may diminish performance, but to a certain degree, beyond which the effect may be inverted (Yuen et al., 2022; Bae et al., 2021). Brammer and Millington (2008) also identified a U-shaped correlation between CSR and financial success, indicating that firms with low environmental performance often exhibit negative outcomes, while those with good environmental performance have favorable results. This outcome corroborates the trade-off idea. Ho et al. (2021b) contend that the implementation of CSR guidelines incurs elevated expenses for banks to

attain social and environmental objectives. Nevertheless, an examination of the data in Table 5 reveals that the positive coefficient on SQ CSR indicates that the advancement of CSR will enhance its impact on bank performance over the long term. Corporate Social Responsibility (CSR) initiatives may initially diminish bank performance due to expenses surpassing benefits; however, this impact turns advantageous in subsequent phases. Our findings corroborate the prior assertions of Le and Ngo (2020b) in China and Avkiran (2011) cross-country.

The results for the CSR components are inconclusive. A U-shaped correlation exists regarding bank accountability to customers (CUS). The findings indicate that CUS has a substantial negative effect, shown by a coefficient of -0.051 (p-value < 0.01), although the nonlinear effect of CUS (SQCUS) is positive and significant at the 1% level, with a coefficient of 0.026. This aligns with the conclusions of Maqbool & Zameer (2018), who contended that CUS may provide financial advantages when executed at an elevated level and with efficacy. Nonetheless, if CUS is executed at a low standard or fails to fulfill consumer expectations, the repercussions may be detrimental. This partially corroborates the trade-off argument, which posits that CSR represents an inefficient allocation of resources (Ho et al., 2021b). Nonetheless, these expenditures may cultivate enhanced loyalty from customers, so potentially enhancing their performance.

Furthermore, the bank of environmental and social responsibility (ESOC) component exhibits a positive effect with a coefficient of 0.064 (p-value < 0.05), aligning with the findings of Simpson and Kohers (2002), which indicate that CSR initiatives focused on environmental and social protection can substantially enhance bank performance. The nonlinear effect of ESOC is detrimental, with a coefficient of -0.273 (p-value < 0.10), suggesting that excessive investment in these aspects may lead banks to incur higher expenses without corresponding advantages. This outcome aligns with the assertion of Brammer et al. (2006), indicating that excessive investment in CSR may incur higher costs without enhancing performance. Nonetheless, these results contradict the perspective that environmental and social elements enhance financial performance (Ashraf, Ilyas, Imtiaz, & Tahir, 2017; Buallay, 2019; Dimitropoulos & Chatzigianni, 2022; Liu & Jung, 2021). Consequently, managers have to use a budget judiciously and avoid excessive application, particularly in the long run.

The Green investment technology (GIT) has a negative and substantial effect on bank performance, achieving statistical significance at the 5% level. This finding indicates that digitization contributes to heightened investment expenses and decreased efficiency in the near run. Bank managers anticipate that these investments will enhance the efficiency and stability of banks over the long term, as evidenced by various authors, including those in Ghana (Appiahene et al., 2019), in Vietnam (T. D. Le, Ngo, Ho, & Nguyen, 2022; Ngo & Le, 2022) and overall financial stability in Europe (Buallay, 2019). Berger and Mester (2003) assert that banks use information processing to optimize the transmission and lending of client data and to enhance risk assessment. Furthermore, they use information technology to convey data. Enhance payment processing by minimizing resource use and increasing efficiency.

In the models, bank size (LnBranch) positively influences bank performance at the 5% significance level. This indicates that banks that rapidly develop their branch networks may access a larger client base, thus enhancing their financial performance and stability (Le, 2021b, 2021a). Conversely, state-owned commercial banks (SOCB) have a considerable adverse effect on performance, aligning with the findings of La Porta et al. (2002), which indicate that state-owned banks often exhibit worse efficiency owing to suboptimal management and insufficient competitive incentives. Banks exhibiting a high asset growth rate (TAGr) have a negative and substantial effect, aligning with the findings of Berger and DeYoung (1997), which indicate that asset growth may elevate costs and risks, particularly during periods of fast expansion. Moreover, a high cost-to-income ratio (CIR) adversely affects bank performance in a statistically meaningful manner, aligning with the cost management hypothesis posited by Athanasoglou et al. (2008), which indicates that banks exhibiting effective cost management would enhance their operational performance.

In conclusion, the regression findings shown in the table above indicate that CSR and its components have substantial positive and negative effects on bank performance. The findings align with other prior research, such as Yuen et al. (2022); Bae et al., (2021), Brammer & Millington (2008), and Maqbool & Zameer (2018). The findings suggest that the effect of CSR may be nonlinear, with advantages manifesting only when CSR investments reach a substantial threshold. Moreover, variables such as administrative expenses, branch distribution, and asset expansion also impact bank profitability.

Table 8: The effects of CSR and CSR’s components on bank performance

Variables	CSR	SHR	EMP	CUS	GOV	ESOC
CSR/CSR components	-0.328**(-2.24)	0.008 (1.18)	0.031 (0.76)	-0.051***(-3.50)	0.094 (1.44)	0.064**(2.54)
SQCSR/CSR components	0.809** (2.16)	-0.036*(-1.78)	-0.100 (-0.63)	0.026*** (3.46)	-0.182 (-0.81)	-0.273*(-1.63)
GIT	-0.318** (-2.07)	-0.079 (-0.77)	-0.120 (-1.13)	-0.380**(-2.37)	-0.145 (-1.32)	-0.085 (-0.81)
LnBranch	0.042 (1.49)	0.076**(2.09)	0.064*(1.94)	0.044*(1.61)	0.058**(2.07)	0.076**(2.07)
NPL	-0.008 (-0.30)	-0.009 (-0.32)	-0.014 (-0.46)	-0.006 (-0.25)	0.001 (0.05)	-0.007 (-0.27)
CIR	-0.052***(-4.63)	-0.057***(-5.64)	-0.057***(-5.59)	-0.049***(-4.07)	-0.050***(-3.95)	-0.057***(-5.62)
TAGr	-0.003**(-2.57)	-0.002*(-1.83)	-0.002*(-1.79)	-0.003***(-2.72)	-0.003**(-2.48)	-0.002*(-1.89)
SOCB	-0.275***(-5.48)	-0.373***(-6.84)	-0.375***(-6.25)	-0.364***(-6.36)	-0.410***(-5.72)	-0.418***(-7.15)
LIST	-0.052 (-0.80)	-0.064 (-1.01)	-0.053 (-0.76)	-0.051 (-0.77)	-0.056 (-0.89)	-0.071 (-1.15)
COVID	-0.369**(-2.09)	-0.011 (-0.06)	-0.057 (-0.34)	-0.383**(-2.25)	-0.274*(-1.69)	-0.009 (-0.05)
BASELII	0.046 (0.60)	0.149 (1.44)	0.143 (1.46)	0.012 (0.17)	0.112 (1.25)	0.171*(1.61)
AUDIT4	-0.021 (-0.40)	0.033 (0.50)	0.029 (0.45)	-0.080 (-1.52)	-0.015 (-0.31)	0.036 (0.53)
CEOGEN	-0.004 (-0.06)	0.000 (0.00)	0.006 (0.08)	-0.032 (-0.34)	-0.010 (-0.11)	0.007 (0.08)
GDP	-0.083** (-2.17)	-0.020 (-0.60)	-0.030 (-0.92)	-0.086**(-2.30)	-0.062*(-1.79)	-0.020 (-0.57)
INF	0.040*** (4.67)	0.035*** (4.97)	0.039*** (4.45)	0.0427*** (4.61)	.026*** (3.58)	0.036*** (4.92)
Const.	8.915*** (10.27)	5.537*** (4.69)	5.449*** (4.26)	7.823*** (12.36)	5.233*** (4.22)	5.515*** (4.67)
Ob.	390	390	390	390	390	390
R-square	0.740	0.718	0.717	0.752	0.737	0.719

Notes: CSR, a bank’s corporate social responsibility index; SHR, shareholder responsibility index; EMP, employee responsibility index; CUS, customer responsibility index; GOV, government responsibility index; ENV, environment and social responsibility index; SQCSR/CSR components, the squared terms of CSR and its components; SIZE, the natural logarithm of total assets; SOCB, a dummy variable that takes a value of 1 for a state-owned commercial bank and 0 otherwise; LIST, a dummy variable that takes a value of 1 for a listed bank, and 0 otherwise; LLP, the ratio of loan loss provisions to total loans; GEN, a dummy variable that takes a value of 1 for a male CEO, and 0 otherwise; GDP, the annual economic growth rate; INF, inflation rate; COVID, a dummy variable that takes a value of 1 for the years 2020-2022, and 0 otherwise. *, **, ***Significant at 10, 5, and 1 per cent levels, respectively.

4.3. The effect of digitalization, CSR on bank performance

Table 9 presents the regression results of the impact of digitalization on CSR and CSR’s components on bank performance. These findings provide insights into the relationship between digitalization, CSR, and bank performance, with the effects controlled through other variables such as size, listing status, and macroeconomic factors. First, Table 9 indicates a significant negative effect of GIT on bank performance, with a negative coefficient (-1.315) and a statistical significance of 5%. This implies that a partial increase in digital investments may increase operating costs and reduce bank stability performance in the short term. This result is consistent with the study of Nguyen et al. (2023), which found that initial investments in green technology require large resources, thereby reducing short-term performance. However, the long-term effects of green technology may not be fully reflected in this analysis. Furthermore, Table 9 also indicates that the influence of digitalization on the correlation

between CSR and bank performance exhibits a positive coefficient of 0.067 with a significance level of 10%, implying that the integration of CSR with green technology investments may enhance bank performance. This is consistent with the findings of Forcadell et al. (2020), who argued that the integration of CSR and digitalization mitigates information asymmetry, enhances transparency and stakeholder confidence, thereby improving bank performance in the long run. Therefore, the above results demonstrate that digitalization (GIT) has played a moderating role in the relationship between CSR and bank performance. Finally, the authors also found similar results for CSR with the bank’s responsibility to customers. This may stem from the short-term costs associated with increased commitment to customers, such as improved service or enhanced product quality. However, when considering the square of CUS, the results show a positive impact with a coefficient of 0.039 (p-value < 0.01), which suggests that investing in customer relationships can bring long-term benefits to bank stability. This result is similar to the study by Maqbool and Zameer (2018), where they also found a positive impact of CSR on customers and long-term performance of banks in India.

From an economic perspective, the findings highlight the need for banks to be clear about the costs and benefits of investing in CSR and digitalization. In the short term, investing in green technology may put financial pressure on banks, but in the long term, if properly integrated with CSR strategies, banks can improve efficiency and enhance competitiveness.

Investing in customer responsibility (CUS) is particularly important, as it not only improves customer loyalty but also leads to more stable performance in the long term. Similarly, environmental social responsibility (ESOC) can help banks better meet regulatory requirements and stakeholder expectations, thereby creating a competitive advantage.

Table 9: The joint effects of CSR/CSR components and green investment technology on bank stability efficiency

Variables	CSR	SHR	EMP	CUS	GOV	ESOC
CSR/CSR components	-0.393**	0.002	0.033	- 0.073***	0.059	0.087*
SQCSR/CSR components	0.937**	- 0.057**	- 0.089	0.039* **	- 0.235	- 0.326*
(CSR/CSR components) * GIT	0.067*	0.030	- 0.019	0.015	0.124*	- 0.074
GIT	-1.315**	-0.155	0.092	- 1.302**	- 0.572*	- 0.073
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Const.	9.554***	5.545* **	5.384 ***	8.586* **	5.378 ***	5.506 ***
Ob.	390	390	390	390	390	390
R-square	0.742	0.719	0.718	0.755	0.743	0.719

Notes: CSR, a bank’s corporate social responsibility index; SHR, shareholder responsibility index; EMP, employee responsibility index; CUS, customer responsibility index; GOV, government responsibility index; ENV, environment and social responsibility index; SQCSR/CSR components, the squared terms of CSR and its components; SIZE, the natural logarithm of total assets; SOCB, a dummy variable that takes a value of 1 for a state-owned commercial bank and 0 otherwise; LIST, a dummy variable that takes a value of 1 for a listed bank, and 0 otherwise; LLP, the ratio of loan loss provisions to total loans; GEN, a dummy variable that takes a value of 1 for a male CEO, and 0 otherwise; GDP, the annual economic growth rate; INF, inflation rate; COVID, a dummy variable that takes a value of 1 for the years 2020-2022, and 0 otherwise. *, **, ***Significant at 10, 5, and 1 per cent levels, respectively.

The findings provide important implications for policymakers and bank managers. First, banks should consider appropriate resource allocation between digitalization and CSR investments to maximize long-term effectiveness. In particular, it is necessary to develop integrated strategies between CSR and digitalization, taking advantage of the regulatory role of digitalization to enhance the positive impact of CSR.

Second, policymakers should support banks by providing financial incentives and appropriate legal frameworks to minimize the initial costs of green technology investments. This is especially important in the context of banks in emerging markets like Vietnam facing many resource challenges.

Finally, banks should focus on investing in customer responsibility and the environment, as these are two areas with the potential to bring sustainable benefits in the long term. These strategies not only help banks achieve business efficiency but also contribute to the sustainable development of the economy.

4.4. Robustness test

The authors conduct several robustness checks to validate the findings of the study. The author only reports the results on the joint impact of CSR with bank characteristics on bank performance. Table 10 provides the results of robustness checks on the impact of CSR on bank performance, measured by return on assets (ROA). The models test the impact of CSR and its interactions with factors such as bank size (LARGE), state ownership (SOCB), listing status (LIST), and the impact of the COVID-19 pandemic.

First, the authors examine whether the correlation between CSR and bank performance may differ across bank sizes. Some studies define large and small banks as those with assets above and below the median (Le, 2019; Le and Pham, 2021; Berger and Bouwman, 2009; Nguyen and Le, 2023; Nguyen and Le, 2022). In contrast to previous studies in Vietnam, we define bank size according to Circular No. 52/2018/TT-NHNN issued by the State Bank of Vietnam. Large and small banks are defined as those with average quarterly total assets above and below VND100 trillion. Therefore, the author includes LARGE, a dummy variable that takes the value of 1 for a large bank and 0 for other banks, and its interaction term, LARGE*CSR, in the base model. Note that SIZE has been excluded from our analysis to avoid multicollinearity problems. The primary findings of the study are that CSR* LARGE has a significant negative impact on ROA with a coefficient of -0.065 and is statistically significant at the 10% level, indicating that when large banks implement CSR, the impact may be negative on short-term performance. This is consistent with the study by Brammer and Millington (2008), which suggests that large banks may face higher CSR costs due to their broader scope of operations, thereby reducing short-term profitability. However, the LARGE variable has a positive impact on ROA with a coefficient of 1.045 and is statistically significant at the 10% level, which is consistent with the study of Demirgüç-Kunt and Huizinga (2010), which argues that larger banks often have competitive advantages and better financial performance.

Second, research further investigates whether the relationship between CSR activities and bank performance may vary across bank ownerships because there are significant differences in the adoption of CSR standards. Table 10 indicates that CSR*SOCB has a substantial positive influence on ROA with a coefficient of 0.097 and is statistically significant at the 1% level, implying that state-owned banks can achieve better financial performance when implementing CSR. This may be because state-owned banks are often supported by the government and have better access to finance when implementing CSR programs. However, the SOCB variable has a strong negative impact on ROA with a coefficient of -1.817 and is statistically significant at the 1% level, suggesting that state-owned banks often have worse financial performance than private banks. This result is consistent with the study of La Porta et al. (2002), in which state-owned banks tend to perform poorly due to weak public governance and low entrepreneurial motivation.

Furthermore, the authors observed same findings for listed banks as for large banks presented above. The evidence indicates that CSR*LIST has a negative impact on ROA with a coefficient of -0.058 (p-value < 0.10), which suggests that listed banks may face higher costs when implementing CSR, thereby reducing short-term profits. However, the variable LIST has a positive impact with a coefficient of 0.874 (p-value < 0.10), suggesting that listed banks may achieve better profits due to their ability to

raise capital more easily and transparently, consistent with the study of Fama and Jensen (1983) on the benefits of financial transparency for listed companies.

Finally, the author examines whether the relationship between CSR activities and bank performance may differ during the COVID-19 pandemic. The results of Table 10 indicate that CSR*COVID and is not statistically significant, with a coefficient of 0.007, suggesting that the combination of CSR and COVID-19 pandemic does not significantly affect the ROA of the banks in the study sample. However, the COVID variable has a negative impact on ROA with a coefficient of -0.409, although it is not statistically significant. This result may suggest that the pandemic has created challenges for banks in terms of financial management, consistent with the results of Goodell (2020), in which the COVID-19 pandemic has negatively affected financial industries globally.

Table 10: The results of robustness checks with ROA

Variables	LARGE	SOCB	LIST	COVID
CSR	-0.038 (-1.31)	-0.080**(-2.21)	-0.037 (-0.98)	-0.077**(-2.23)
CSR * LARGE	-0.065*(-1.63)			
LARGE	1.045*(1.61)			
CSR * SOCB		0.097*** (3.88)		
SOCB		-1.817***(-4.55)		
CSR * LIST			-.058*(-1.96)	
LIST			0.874*(1.78)	
CSR * COVID				0.007 (0.28)
COVID				-0.409 (-0.88)
Control variables	Yes	Yes	Yes	Yes
Const.	6.584*** (7.36)	7.029*** (9.97)	6.389*** (7.59)	6.965*** (9.29)
Ob.	390	390	390	390
R-square	0.736	0.737	0.737	0.734

Notes: CSR, a bank's corporate social responsibility index; $SQCSR$, the squared terms of CSR; CSR * LARGE, the interaction term among CSR, GCR, and LARGE; CSR * SOCB, the interaction term among CSR and SOCB; CSR * LIST, the interaction term among CSR and LIST; CSR * COVID, the interaction term among CSR and COVID; LARGE, a dummy variable that takes a value of 1 for a bank with total assets of above VND 100 trillion, and 0 otherwise; SOCB, a dummy variable that takes a value of 1 for a state-owned commercial bank and 0 otherwise; LIST, a dummy variable that takes a value of 1 for a listed bank, and 0 otherwise; COVID, a dummy variable that takes a value of 1 for the years 2020-2022, and 0 otherwise. * and *** Significant at 10 and 1 per cent levels, respectively.

Finally, the author used the NIM variable representing the bank's operating efficiency to replace the ROA margin and entered it into equations (1) and (2) for regression and the results were presented in Table 11 below.

Table 11 presents the findings of robustness checks examining the impact of CSR and its interaction factors on banks' return on assets (ROA) and net interest margin (NIM). This result is particularly important to understand the nonlinear relationship between CSR and bank performance, and to assess the role of digitalization (GIT) in influencing financial performance. Table 11 provides evidence of a U-shaped relationship between CSR and bank performance in equation (1) and is statistically significant at the 5% and 1% levels. Furthermore, the regression results of equation (2) demonstrate that the interaction between CSR and GIT has a positive coefficient of 0.733 (p-value < 0.05), suggesting that when banks combine CSR with digitalization, their financial performance can be improved. This indicates that digitalization plays an important role in optimizing the benefits of CSR, helping banks achieve both their social responsibility goals and improve their performance. This result is consistent with the study by Forcadell et al. (2020), which asserts that the combination of CSR and digitalization

helps reduce information asymmetry and improve customer trust. In summary, the aforementioned data demonstrates that my research paradigm is quite resilient.

Table 11: The results of robustness checks with NIM

Variables	CSR	CSR
CSR/CSR components	-1.239**(-2.37)	-1.946***(-2.87)
SQCSR/CSR components	2.884*(1.85)	4.273**(2.38)
(CSR/CSR components) * GIT		0.733**(2.48)
GIT		-11.402**(-2.38)
Control variables	Yes	Yes
Const.	17.230*** (3.39)	24.188*** (3.63)
Ob.	390	390
R-square	0.206	0.218

Notes: CSR, a bank’s corporate social responsibility index; SHR, shareholder responsibility index; EMP, employee responsibility index; CUS, customer responsibility index; GOV, government responsibility index; ENV, environment and social responsibility index; SQCSR/CSR components, the squared terms of CSR and its components; SIZE, the natural logarithm of total assets; SOCB, a dummy variable that takes a value of 1 for a state-owned commercial bank and 0 otherwise; LIST, a dummy variable that takes a value of 1 for a listed bank, and 0 otherwise; LLP, the ratio of loan loss provisions to total loans; GEN, a dummy variable that takes a value of 1 for a male CEO, and 0 otherwise; GDP, the annual economic growth rate; INF, inflation rate; COVID, a dummy variable that takes a value of 1 for the years 2020-2022, and 0 otherwise. *, **, ***Significant at 10, 5, and 1 per cent levels, respectively.

5. Conclusion and Implications

5.1. Conclusion

This research investigated the influence of CSR and digitalization on bank performance in Vietnam from 2010 to 2022. Some of the key findings are highlighted as follows. The findings indicate a U-shaped relationship between CSR adoption and bank performance, implying that both stakeholder theory and trade-off theory perfectly explain the relationship between CSR adoption and bank performance. CSR may initially reduce bank performance as the implementation costs exceed the benefits, but when invested at higher levels, the impact of CSR becomes positive, improving bank performance in the long run. This confirms the views of Yuen et al. (2022), Bae et al. (2021), and Brammer & Millington (2008) on the U-shaped relationship between CSR and bank performance.

Furthermore, CSR components such as customer responsibility (CUS) and environmental and social responsibility (ESOC) show different impacts. CUS has a negative short-term impact, but when implemented at a high level, it can bring long-term benefits to bank stability, which is consistent with the study of Maqbool & Zameer (2018). Meanwhile, ESOC has a positive impact when invested at a reasonable level, but when over-invested in social and environmental aspects, the operational performance of the bank may decrease as the costs exceed the benefits, similar to the findings of Brammer et al. (2006).

Moreover, green technology or digitalization (GIT) investments initially reduce bank performance due to high investment costs, but when combined with CSR, GIT can help optimize long-term benefits. This highlights the importance of investing in digital and “green” technology to increase bank performance, consistent with the study of Forcadell et al. (2020). Factors such as bank size, number of branches, and management costs also play an important role in explaining the differences in financial performance among banks.

Finally, the study’s findings indicate that major, state-owned, publicly listed banks get the most advantages from enhancing their commitment to CSR and digitization efforts. The findings suggests that the COVID-19 epidemic has adversely affected banks, presenting issues in financial management. Nonetheless, it lacks statistical significance.

5.2. Implications and limitations

From the above analysis, the author proposes some policy implications for bank managers and state-owned banks as follows:

For banks: bank managers should invest in CSR strategically and sustainably, ensuring that CSR initiatives are implemented at a large enough scale to generate clear financial benefits. Implementing CSR at a low level or not deep enough can be costly without bringing commensurate benefits. Furthermore, the research results indicate that initial investment in green technology or digitalization (GIT) can cause high costs and negatively affect short-term performance. However, in the long term, when combined with CSR, GIT can help optimize operational performance. Banks should plan for long-term investment in green technology/digitalization and ensure that these investments are managed effectively to create sustainable value. In addition, bank managers should consider how to choose a CSR and/or digital investment strategy that is suitable for short-term and long-term benefits. Moreover, managers can combine these two strategies to optimize costs and allocate resources appropriately.

For the State Bank: The State Bank of Vietnam (SBV) may use insights from the case of large and listed banks to other banks. SBV may facilitate investment in green technology or digitalization by offering tax rebates, financial assistance, or other incentives. SBV must enhance training and advocacy to support bank managers and all employees to understand the benefits of digitalization and the social responsibility that needs to be implemented.

However, this research may encounter several limitations. This research only investigated the impact of CSR and digitalization on bank performance in Vietnam over a short period of 2010-2022. Therefore, further research may expand this study using a larger sample over a longer time frame in other markets with similar banking structures to ensure robustness. Furthermore, further research might use an alternative CSR metric (Zhou et al., 2021) to corroborate my findings.

In conclusion, this study provides novel evidence on the complex relationships among CSR, digitalization, and bank performance in Vietnam. These findings reveal that while both CSR and digitalization initiatives may initially reduce bank performance due to implementation costs, they generate positive returns when implemented at sufficient scale and in combination. The study makes several important contributions to the literature. First, the author develops a more objective CSR measurement using PCA methodology. Second, the author provides evidence of nonlinear relationships between CSR, digitalization, and performance. Third, the author demonstrates how bank characteristics moderate these relationships. These findings have important implications for bank managers and regulators in emerging markets. Future research could extend this analysis to other emerging markets and examine longer-term effects of digital transformation on CSR implementation.

Reference

Accounting & accountability: changes and challenges in corporate social and environmental reporting. (1996). *Prentice hall*.

Acharya, V. V., Philippon, T., Richardson, M., & Roubini, N. (2011). The financial crisis of 2007-2009: Causes and remedies. *Financial Markets, Institutions & Instruments*, 18(2), 89-137.

Al-Malkawi, H. A. N., & Pillai, R. (2018). Analyzing financial performance by integrating conventional governance mechanisms into the GCC Islamic banking framework. *Managerial Finance*, 44(5), 604-623. doi:10.1108/MF-05-2017-0200

Alshbili, I., Elamer, A. A., & Beddewela, E. (2020). Ownership types, corporate governance and corporate social responsibility disclosures: Empirical evidence from a developing country. *Accounting Research Journal*, 33(1), 148-166. doi:<https://doi.org/10.1108/ARJ-03-2018-0060>

Amran, A., Fauzi, H., Purwanto, Y., Darus, F., Yusoff, H., Zain, M. M., & Nejati, M. (2017). Social responsibility disclosure in Islamic banks: a comparative study of Indonesia and Malaysia. *Journal of Financial Reporting and Accounting*, 15(1), 99-115. doi:10.1108/JFRA-01-2015-0016

Analyzing financial performance by integrating conventional governance mechanisms into the GCC Islamic banking framework. (2018). *Managerial Finance*, 44(5), 604-623.

Andrieş, A. M., & Sprincean, N. (2023). ESG performance and banks' funding costs. *Finance Research Letters*, 54, 103811. doi:<https://doi.org/10.1016/j.frl.2023.103811>

Aramburu, I. A., & Pescador, I. G. (2019). The effects of corporate social responsibility on customer loyalty: The mediating effect of reputation in cooperative banks versus commercial banks in the Basque country. *Journal of business ethics*, 154, 701-719.

Are more corporate social investments better? Evidence of non-linearity effect on costs of US Bank loans. (2018). *Global Finance Journal*, 38, 82-96.

Azmi, W., Hassan, M. K., Houston, R., & Karim, M. S. (2021). ESG activities and banking performance: International evidence from emerging economies. *Journal of International Financial Markets, Institutions and Money*, 70, 101277.

The assessment of corporate social responsibility: The construction of an industry ranking and identification of potential for improvement. . (2019). *European Journal of Operational Research*, 278(272), 498-513.

Assurance on CSR reports: impact on the credibility perceptions of non-financial information by bank directors. (2020). *Meditari Accountancy Research*, 28(5), 833-862.

Azmi, W., Hassan, M. K., Houston, R., & Karim, M. S. (2021). ESG activities and banking performance: International evidence from emerging economies. *Journal of International Financial Markets, Institutions and Money*, 70, 101277. doi:<https://doi.org/10.1016/j.intfin.2020.101277>

Azmi, W., Hassan, M. K., Houston, R., & Karim, M. S. (2021). ESG activities and banking performance: international evidence from emerging economies. *Journal of International Financial Markets, Institutions and Money*, 70, p. 101277. doi: <https://doi.org/10.1016/j.intfin.2020.101277>

Bătae, O. M., Dragomir, V. D., & Feleagă, L. (2021). The relationship between environmental, social, and financial performance in the banking sector: A European study. *Journal of cleaner production*, 290, 125791. doi: <https://doi.org/10.1016/j.jclepro.2021.125791>

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2010). Financial institutions and markets across countries and over time: The updated financial development and structure database. *World Bank Economic Review*, 24(1), 77-92.

Belasri, S., Gomes, M., & Pijourlet, G. (2020). Corporate social responsibility and bank efficiency. *Journal of Multinational Financial Management*, 54, 100612. doi:<https://doi.org/10.1016/j.mulfin.2020.100612>

Ben Abdallah, S., Saïdane, D., & Ben Slama, M. (2020). CSR and banking soundness: A causal perspective. *Business ethics: A European review*, 29(4), 706-721.

Bischof, R., Bourdier, N., Gassmann, P., Wackerbeck, P., & Marek, S. (2021). European bank transformation: Why banks can no longer ignore ESG [Press release]

Board of directors and CSR disclosure in Indonesian banking industry: does education matter? (2017). *International Journal of Trade and Global Markets*, 10(4), , 322-333.

Borgatti, S. P., Agneessens, F., Johnson, J. C., & Everett, M. G. (2024). *Analyzing social networks*: SAGE Publications.

Boubaker, S., Le, T. D., & Ngo, T. (2022). Managing bank performance under COVID-19: A novel inverse DEA efficiency approach. *International Transactions in Operational Research*, 30, 2436-2452. doi: <https://doi.org/10.1111/itor.13132>

Brammer, S. J., Pavelin, S., & Porter, L. A. (2006). Corporate social performance and geographical diversification. *Journal of Business Research*, 59(9), 1025-1034.

Branco, M. C., & Rodrigues, L. L. (2006). Corporate social responsibility and resource-based perspectives. *Journal of business ethics*, 69, 111-132.

Buallay, A. (2019). Is sustainability reporting (ESG) associated with performance? Evidence from the European banking sector. *Management of Environmental Quality: An International Journal*, 30, no. 1, pp. 98-115. . doi:<https://doi.org/10.1108/MEQ-12-2017-0149>

Buallay, A. M., Wadi, R. M. A., Kukreja, G., & Hassan, A. A. (2020). Evaluating ESG disclosures of Islamic banks: Evidence from the organization of Islamic cooperation members. *International Journal of Innovation and Sustainable Development*, 14(3), 266-287. doi:10.1504/IJISD.2020.108045

Change, I. P. O. C. (2007). Climate change 2007: The physical science basis. *Agenda*, 6(07), 333.

Cheung, Y. L., Tan, W., & Wang, W. (2018). National stakeholder orientation, corporate social responsibility, and bank loan cost. *Journal of business ethics*, 150, 505-524. doi:<https://doi.org/10.1007/s10551-016-3140-8>

Chih, H. L., Chih, H. H., & Chen, T. Y. (2010). On the determinants of corporate social responsibility: International evidence on the financial industry. *Journal of business ethics*, 93, 115-135. doi: <https://doi.org/10.1007/s10551-009-0186-x>

Chen, Y., & Zhang, Y. (2024). The impact of digital transformation on firm's financial performance: evidence from China. *Industrial Management & Data Systems*.

Clair, R. W. S. (2004). Macroeconomic determinants of banking financial performance and resilience in Singapore *Macroeconomic Surveillance Department, Monetary Authority of Singapore.*, Vol. 38.

Cornett, M. M., Erhemjamts, O., & Tehranian, H. (2016). Greed or good deeds: An examination of the relation between corporate social responsibility and the financial performance of U.S. commercial banks around the financial crisis. *Journal of Banking & Finance*, 70, 137-159. doi:<https://doi.org/10.1016/j.jbankfin.2016.04.024>

Corporate governance attributes as determinants of the Islamic Social Reporting of Shariah-compliant companies in Malaysia. (2018). *International Journal of Economics and Management*, 12(1), 169-180.

Corporate social responsibility and bank efficiency. (2020). *Journal of Multinational Financial Management*, 54, 100612.

"Corporate social responsibility and bank financial performance in China: The moderating role of green credit". (2021). *Energy Economics*, 97, 105190.

Crotty, J. (2009). Structural causes of the global financial crisis: a critical assessment of the 'new financial architecture'. *Cambridge journal of economics*, 33(4), 563-580.

CSR disclosure, corporate governance and firm value: a study on GCC Islamic banks. (2020). *International Journal of Accounting & Information Management*, 28(4), 607-638.

CSR information disclosure on the web: a context-based approach analysing the influence of country of origin and industry sector. (2008). *Journal of business ethics*, 82, 369-378.

Cui, Y., Geobey, S., Weber, O., & Lin, H. (2018). The impact of green lending on credit risk in China. *Sustainability*, 10(6), 2008.

Dallas, L. L. (2011). Short-termism, the financial crisis, and corporate governance. *Journal of Corporation Law*, 37, 265.

Demirgüç-Kunt, A., Pedraza, A., & Ruiz-Ortega, C. (2021). Banking sector performance during the COVID-19 crisis. *Journal of Banking & Finance*, 106305. doi:<https://doi.org/10.1016/j.jbankfin.2021.106305>

Determinants of commercial bank performance in transition: An application of data envelopment analysis. . (2006). *Comparative Economic Studies*, , 48, 497-522.

Determinants of corporate social responsibility disclosure: An empirical study of Polish listed companies. . (2017). *Sustainability (Switzerland)*, 9(11).

Determinants of corporate social responsibility disclosure: the case of Islamic banks. . (2011). *Journal of Islamic Accounting and Business Research*, 2(2), 114-141.

Determinants of financial performance in Chinese banking. . (2010). *Applied Financial Economics*, , 20(20), 1585-1600.

The determinants of profitability of Indian commercial banks: A panel data approach. . (2019). *International Journal of Finance & Economics*, 24(21), 168-185.

Di Tommaso, C., & Thornton, J. (2020). Do ESG scores effect bank risk taking and value? Evidence from European banks. *Corporate Social Responsibility and Environmental Management*, 27(5), 2286-2298. doi:<https://doi.org/10.1002/csr.1964>

Does corporate social responsibility affect the cost of bank loans? Evidence from China. (2017). *Emerging Markets Finance and Trade*, 53(7), 1589-1602.

Dose–volume objectives in multi-criteria optimization. (2006). *Physics in Medicine & Biology*, 51(15), 3809.

E-Vahdati, S., Zulkifli, N., & Zakaria, Z. (2019). Corporate governance integration with sustainability: a systematic literature review. *Corporate Governance: The international journal of business in society*, 19(2), 255-269.

The effect of corporate social responsibility on open innovation: the moderating role of firm proactiveness. (2023). *Management Decision.*, e-print.

The effects of board size and board composition on CSR disclosure: a study of banking sectors in Bangladesh. (2021). *International Journal of Ethics and Systems*, 37(1), 105-121.

The effects of corporate social responsibility on customer loyalty: The mediating effect of reputation in cooperative banks versus commercial banks in the Basque country. (2019). *Journal of business ethics*, 154, 701-719.

Elfeky, M. I. (2017). The extent of voluntary disclosure and its determinants in emerging markets: Evidence from Egypt. *The Journal of Finance and Data Science*, 3(1-4), 45-59.

Esteban-Sanchez, P., de la Cuesta-Gonzalez, M., & Paredes-Gazquez, J. D. (2017). Corporate social performance and its relation with corporate financial performance: International evidence in the banking

industry. *Journal of cleaner production*, 162, 1102-1110.
doi:<https://doi.org/10.1016/j.jclepro.2017.06.127>

Fair value, corporate governance, social responsibility disclosure and banks' performance. (2020). *Review of Accounting and Finance*, 19(1), 30-47.

Fayad, A. A., Ayoub, R., & Ayoub, M. (2017). Causal relationship between CSR and FB in banks. *Arab Economic and Business Journal*, 12(2), 93-98. doi:<https://doi.org/10.1016/j.aebj.2017.11.001>

The financial crisis as a wake-up call: corporate governance and bank performance in an emerging economy. (2019). *Corporate Governance: The International Journal of Business in Society*, 19(1), 80-101.

FIRMS CHARACTERISTICS, SUSTAINABILITY REPORTING AND VALUE OF THE FIRM (2017). *An Empirical Analysis of Public Companies Listed in Indonesia*, (Doctoral dissertation, Universitas Diponegoro).

Fombrun, C. J., Gardberg, N. A., & Barnett, M. L. (2000). Opportunity platforms and safety nets: Corporate citizenship and reputational risk. *Business and society review*, 105(1). doi:<https://ssrn.com/abstract=1088404>

Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Cambridge University Press.

Friedman, M. (1970). The social responsibility of business is to increase its profits. *New York Times*, 32(13), 122-126. doi: <http://www.jstor.org/stable/3560237>

From driver to enabler: the moderating effect of corporate social responsibility on firm performance. (2021). *Economic research-Ekonomska istraživanja*, 34(1), 2240-2262.

Gangi, F., Mustilli, M., & Varrone, N. (2019). The impact of corporate social responsibility (CSR) knowledge on corporate financial performance: evidence from the European banking industry. *Journal of Knowledge Management*, 23, no. 1, pp. 110–134. doi: <https://doi.org/10.1108/JKM-04-2018-0267>

Gangi, F., Salerno, D., Meles, A., & Daniele, L. M. (2019). Do corporate social responsibility and corporate governance influence intellectual capital efficiency? *Sustainability*, 11(7), 1899. doi:<https://doi.org/10.3390/su11071899>

García-Sánchez, E., García-Morales, V. J., & Martín-Rojas, R. (2018). Influence of technological assets on organizational performance through absorptive capacity, organizational innovation and internal labour flexibility. *Sustainability*, 10(13), 770.

Gaur, S. S., Vasudevan, H., & Gaur, A. S. (2011). Market orientation and manufacturing performance of Indian SMEs. *European Journal of Marketing*, 45 Nos 7/8, pp. 1172-1193. doi:<https://doi.org/10.1108/03090561111137660>

Gossling, S. (2010). Carbon management in tourism. 272.

Governance and type of industry as determinants of corporate social responsibility disclosures in Latin America. (2020). *Latin American Business Review*, 21(1), 1-35.

"Greed or good deeds: An examination of the relation between corporate social responsibility and the financial performance of U.S. commercial banks around the financial crisis",. (2016). *Journal of Banking & Finance*, 70 No., pp.9. , 137-115.

“Green washing” or “authentic effort”? An empirical investigation of the quality of sustainability reporting by banks. (2021). *Accounting, Auditing & Accountability Journal*, 34(2), 338-369.

Harun, M. S., Hussainey, K., Mohd Kharuddin, K. A., & Farooque, O. A. (2020). CSR disclosure, corporate governance and firm value: a study on GCC Islamic banks. *International Journal of Accounting & Information Management*, 28(4), 607-638. doi: <https://doi.org/10.1108/IJAIM-08-2019-0103>

Hillman, A. J., & Keim, G. D. (2001). Shareholder value, stakeholder management, and social issues: what's the bottom line? *Strategic management journal*, 22(2), 125-139.

Ho, T. H., Nguyen, D. T., Luu, T. B., Le, T. D. Q., & Ngo, T. D. (2023). Bank performance during the COVID-19 pandemic: does income diversification help? *Journal of Applied Economics*, 26(1), 2222964.

Horváthová, E. (2010). Does environmental performance affect financial performance? A meta-analysis. *Ecological Economics*, 70(1), 52-59. doi:<https://doi.org/10.1016/j.ecolecon.2010.04.004>

Horváthová, E. (2010). Does environmental performance affect financial performance? A meta-analysis. *Ecological economics*, 70(1), 52-59. doi:<https://doi.org/10.1016/j.ecolecon.2010.04.004>

Hurley, R., Gong, X., & Waqar, A. (2014). Understanding the loss of trust in large banks. *International Journal of Bank Marketing*, 32(5), 348-366.

The impact of corporate social responsibility disclosure on financial performance: Evidence from the GCC Islamic banking sector. (2018). *Journal of Business Ethics*, 151, 451-471.

The impact of corporate social responsibility on stock price volatility of the US banks: A moderating role of tax. (2021). *Journal of Financial Reporting and Accounting*, 19(1), 77-91.

Implementation of the AAOIFI index on CSR disclosure in Indonesian Islamic banks. (2019). *Journal of Financial Reporting and Accounting*, 17(3), 365-382.

Is better banking performance associated with financial inclusion and mandated CSR expenditure in a developing country? (2021). *Accounting & Finance*, 61(1), 125-161.

Islamic finance development and banking ESG scores: Evidence from a cross-country analysis. (2020). *Research in International Business and Finance*, 51, 101100.

Jeucken, M. (2010). *Sustainable finance and banking: The financial sector and the future of the planet*: Routledge.

Khan, H. Z., Bose, S., Mollik, A. T., & Harun, H. (2021). "Green washing" or "authentic effort"? An empirical investigation of the quality of sustainability reporting by banks. *Accounting, Auditing & Accountability Journal*, 34(2), 338-369. doi:10.1108/AAAJ-01-2018-3330

Khatib, S. F., Abdullah, D. F., Elamer, A. A., & Abueid, R. (2021). Nudging toward diversity in the boardroom: A systematic literature review of board diversity of financial institutions. *Business Strategy and the Environment*, 30(2), 985-1002.

Kim, S., & Lee, Y. J. (2012). The complex attribution process of CSR motives. *Public relations review*, 38(31), 168-170.

Lahouel, B. B., Bruna, M. G., & Zaied, Y. B. (2020). The curvilinear relationship between environmental performance and financial performance: An investigation of listed french firms using panel smooth transition model. *Finance Research Letters*, 35, 101455.

Le, T. D., Ngo, T., Ho, T. H., & Nguyen, D. T. (2022). ICT as a key determinant of efficiency: A bootstrap-censored quantile regression (BCQR) analysis for Vietnamese banks. *International Journal of Financial Studies*, 10(2), 44. doi:<https://doi.org/10.3390/ijfs10020044>

- Legitimacy theory and environmental practices: short notes. (2015). *International Journal of Business and Statistical Analysis*, Vol. 2 No. 1, pp. 41-53.
- Levine, R. (2005). Finance and growth: Theory and evidence. In P. Aghion & S. N. Durlauf (Eds.), *Handbook of Economic Growth (Vol. 1, Part A, pp. 865-934)*.
- Levitt, T. (1958). The dangers of social-responsibility. *Harvard business review*, 36(5), 41-50.
- Lima Crisóstomo, V., de Souza Freire, F., & Cortes de Vasconcellos, F. (2011). Corporate social responsibility, firm value and financial performance in Brazil. *Social Responsibility Journal*, 7(2), 295-309. doi:10.1108/174711111111141549
- Liu, L., Zhang, C., Wang, Z., & Liu, Y. (2024). Green technology investment selection with carbon price and competition: One-to-many matching structure. *Journal of Cleaner Production*, 434, 139893.
- Mapping of internal audit research in China: A systematic literature review and future research agenda. (2021). *Cogent Business & Management*, 8(1), 1938351.
- Maqbool, S., & Zameer, M. N. (2018). Corporate social responsibility and financial performance: An empirical analysis of Indian banks. *Future Business Journal*, 4(1), 84-93. doi:<https://doi.org/10.1016/j.fbj.2017.12.002>
- Mirzaei, A., Saad, M., & Emrouznejad, A. (2022). Bank stock performance during the covid-19 crisis: does efficiency explain why islamic banks fared relatively better? *Annals of Operations Research*. doi:<https://doi.org/10.1007/s10479-022-04600-y>
- Mohamad, N. M., Masron, T. A., Wijayanti, R., & Jamil, M. M. (2020). Islamic banking and income inequality: The role of corporate social responsibility. *Jurnal Ekonomi Malaysia*, 54(2), 77-90.
- Motivations and barriers for corporate social responsibility reporting: Evidence from the airline industry. . (2016). *Journal of Air Transport Management*, , 57, 184-195.
- Muhammad, R., & Nugraheni, P. (2021). The effect of internal factors on the mudharabah financing of Indonesian Islamic banks. *Journal of Sustainable Finance & Investment*, 1-17. doi:10.1080/20430795.2021.1978917
- National stakeholder orientation, corporate social responsibility, and bank loan cost. (2018). *Journal of Business Ethics*, 150, 505-524.
- Nations, U. (2018). The sustainable development goals report 2018. *United Nations*.
- Neitzert, F., & Petras, M. (2022). Corporate social responsibility and bank risk. *Journal of Business Economics*, 92(3), 397-428. doi:10.1007/s11573-021-01069-2
- Newman, M. E. (2006). Modularity and community structure in networks. *Proceedings of the national academy of sciences*, 103(23), 8577-8582.
- Nguyen-Thi-Huong, L., Nguyen-Viet, H., Nguyen-Phuong, A., & Van Nguyen, D. (2023). How does digital transformation impact bank performance? . *Cogent Economics & Finance*, 11(1), 2217582. doi:doi:10.1080/23322039.2023.2217582
- Nguyen, L. T., & Nguyen, K. V. (2021). The impact of corporate social responsibility on the risk of commercial banks with different levels of financial constraint. *Asia-Pacific Journal of Business Administration*, 13(1), 98-116.
- Omair Alotaibi, K., & Hussainey, K. (2016). Determinants of CSR disclosure quantity and quality: Evidence from non-financial listed firms in Saudi Arabia. *International Journal of Disclosure and Governance*, 13(4), 364-393.

Paltrinieri, A., Dreassi, A., Migliavacca, M., & Piserà, S. (2020). Islamic finance development and banking ESG scores: Evidence from a cross-country analysis. *Research in International Business and Finance*, 51, 101100. doi:<https://doi.org/10.1016/j.ribaf.2019.101100>

Platonova, E., Asutay, M., Dixon, R., & Mohammad, S. (2018). The impact of corporate social responsibility disclosure on financial performance: Evidence from the GCC Islamic banking sector. *Journal of business ethics*, 151, 451-471. doi:10.1007/s10551-016-3229-0

Prabowo, M. A., Iswaningtyas, A., Syofyan, E., Idris, I., Mulazid, A. S., & Habbe, A. H. (2017). Board of directors and CSR disclosure in Indonesian banking industry: does education matter? *International Journal of Trade and Global Markets*, 10(4), 322-338. doi:10.1504/IJTGM.2017.090280

Quick, R., & Inwinkl, P. (2020). Assurance on CSR reports: impact on the credibility perceptions of non-financial information by bank directors. *Meditari Accountancy Research*, 28(5), 833-862. doi:10.1108/MEDAR-10-2019-0597

Rajan, R. G. (2006). Has finance made the world riskier? *European Financial Management*, 12(4), 499-533.

Ramzan, M., Amin, M., & Abbas, M. (2021). How does corporate social responsibility affect financial performance, financial stability, and financial inclusion in the banking sector? Evidence from Pakistan. *Research in International Business and Finance*, 55, 101314. doi:<https://doi.org/10.1016/j.ribaf.2020.101314>

Rouf, M. A., & Hossan, M. A. (2021). The effects of board size and board composition on CSR disclosure: a study of banking sectors in Bangladesh. *International Journal of Ethics and Systems*, 37(1), 105-121. doi:10.1108/IJOES-06-2020-0079

Sekaran, U., & Bougie, R. (2016). Research methods for business: A skill building approach. *John wiley & sons*.

Shen, H., Wu, H., Long, W., & Luo, L. (2021). Environmental performance of firms and access to bank loans. *The International Journal of Accounting*, 56(02), 2150007. doi:<https://doi.org/10.1142/S1094406021500074>

Sial, M. S., Chunmei, Z., Khan, T., & Nguyen, V. K. (2018). Corporate social responsibility, firm performance and the moderating effect of earnings management in Chinese firms. *Asia-Pacific Journal of Business Administration*, 10 Nos 2-3, pp. 184-199. doi:<https://doi.org/10.1108/APJBA-03-2018-0051>

Simpson, W. G. K., T. (2002). The link between corporate social and financial performance: Evidence from the banking industry. *Journal of business ethics*, 35, 97-109.

Situ, H., Tilt, C., & Seet, P. S. (2021). The influence of the Chinese government's political ideology in the field of corporate environmental reporting. *Accounting, Auditing & Accountability Journal*, 34(9), 1-28. doi:<https://doi.org/10.1108/AAAJ-09-2016-2697>

Soana, M.-G. (2011). The Relationship Between Corporate Social Performance and Corporate Financial Performance in the Banking Sector. *Journal of business ethics*, 104, no., pp. 133-148. doi:<https://doi.org/10.1007/s10551-011-0894-x>

Social responsibility disclosure in Islamic banks: a comparative study of Indonesia and Malaysia. (2017). *Journal of Financial Reporting and Accounting*, 15(1), 99-115.

Sustainable development in brand loyalty: Exploring the dynamics of corporate social responsibility, customer attitudes, and emotional contagion. (2024). *Corporate Social Responsibility and Environmental Management*, print.

Tasnia, M., Syed Jaafar AlHabshi, S. M., & Rosman, R. (2021). The impact of corporate social responsibility on stock price volatility of the US banks: A moderating role of tax. *Journal of Financial Reporting and Accounting*, 19(1), 77-91. doi:10.1108/JFRA-01-2020-0020

Tessema, A. (2019). The impact of corporate governance and political connections on information asymmetry: International evidence from banks in the Gulf Cooperation Council member countries. *Journal of International Accounting, Auditing and Taxation*, 35, 1-17. doi:10.1016/j.intaccudtax.2019.05.001

Theory of the firm: Managerial behavior, agency costs and ownership structure. . (2019). In *Corporate governance* (77-132). Gower.

Valverdie, S. C., Humphrey, D., & Fernandez, F. R. (2003). Deregulation, bank competition and regional growth. *Regional Studies*, 37(3), 227-237.

Vo, D. H., Tran, N. P., Hoang, H. T.-T., & Van, L. T.-H. (2022). Do corporate social responsibility and bank performance matter for financial inclusion in Vietnam? *Journal of Asia Business Studies*, 16 No. 4, pp.639-651. doi:<https://doi.org/10.1108/JABS-11-2020-0462>

Wellalage, N. H., & Kumar, V. (2021). Environmental performance and bank lending: Evidence from unlisted firms. *Business Strategy and the Environment*, 30 No. 7, pp.3309-3329. doi:<https://doi.org/10.1002/bse.2804>

Where do banks value corporate social responsibility more? Evidence on the role of national culture. (2020). *Journal of Banking & Finance*, 118, 105810.

Wu, M. W., & Shen, C. H. (2013). Corporate social responsibility in the banking industry: Motives and financial performance. *Journal of Banking & Finance*, 37(9), 3529-3547. doi:<https://doi.org/10.1016/j.jbankfin.2013.04.023>

Yahaya, O. A., & Apochi, J. (2021). Board of directors and corporate social responsibility reporting of quoted companies in Nigeria.

Yuen, M. K., Ngo, T., Le, T. D. Q., & Ho, T. H. (2022). The environment, social and governance (ESG) activities and profitability under COVID-19: evidence from the global banking sector. *Journal of Economics and Development*, 24(4), 345-364. doi:<https://doi.org/10.1108/JED-08-2022-0136>

Yuen, M. K., Ngo, T., Le, T. D. Q., & Ho, T. H. (2022). The environment, social and governance (ESG) activities and profitability under COVID-19: evidence from the global banking sector. *Journal of Economics and Development*, 24(4), 345-364. doi:<https://doi.org/10.1108/JED-08-2022-0136>

Zafar, M. B., & Sulaiman, A. A. (2020). Measuring corporate social responsibility in Islamic banking: what matters? *International Journal of Islamic and Middle Eastern Finance and Management*, 13(3), 357-388. doi: <https://doi.org/10.1108/IMEFM-05-2019-0227>

Zhang, K., Wang, Y., & Huang, Z. (2021). Do the green credit guidelines affect renewable energy investment? Empirical research from China. *Sustainability*, 13(16), 9331. doi:<https://doi.org/10.3390/su13169331>

Zhang, Y., Chong, G., & Jia, R. (2020). Fair value, corporate governance, social responsibility disclosure and banks' performance. *Review of Accounting and Finance*, 19(1), 30-47. doi: <https://doi.org/10.1016/j.intaccudtax.2019.05.001>

Zhou, G., Sun, Y., Luo, S., & Liao, J. (2021). "Corporate social responsibility and bank financial performance in China: The moderating role of green credit". *Energy Economics*, 97, 105190. . doi:<https://doi.org/10.1016/j.eneco.2021.105190>