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Examining the Relationship between Social Responsibilities, Banking Characteristics and Operating Efficiency: A Study of Commercial Banking in Vietnam

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Abstract. This study empirically investigates the relationship between social responsibility and social responsibility aspects on the operating efficiency of Vietnamese commercial banks from 2017 to 2021. The findings demonstrate that the regulatory function of bank characteristics such as ownership structure, asset size, and stock market listing affect the relationship between social responsibility and bank performance. The results also emphasize that the regulatory role of bank characteristics such as asset size, ownership structure and listing on the stock exchange, which impacts on the relationship of social responsibility and performance in order to help managers have corporate governance on social responsibility as a long-term investment activity to be deployed more aggressively in small banks. More specifically, the more information banks disclose about social responsibility, the greater their operational efficiency, particularly in regards to products, the environment, consumers, partners, the community and society, and managers. For banks with smaller-than-average asset sizes, the more CSR information banks disclose, the greater their operational efficiency. In addition, the same findings are observed in the case of large institutions, where the greater the disclosure of corporate social responsibility, the greater the effectiveness. Meanwhile, the efficacy decreases as the deposit-to-capital ratio rises. This enables bank managers to adapt their business strategies to the actual circumstances of their entities so as to achieve sustainable development objectives.

Keywords: Social responsibilities, banking characteristics, operating efficiency and banking sectors

1. Introduction

Corporate social responsibility (CSR) is becoming increasingly important for organizations, especially in the banking sector (Wu & Shen, 2013; Platonova et al., 2018 and Buallay, 2019). Banks aspire to improve CSR to improve financial stability, customer service, and financial obstacles (Buallay, 2019; Siueia et al., 2019; Gangi, 2018; and Bătae, 2021). In addition, CSR has attracted the attention of both theoretical and empirical economists, as well as numerous enterprises and corporations in a variety of fields. CSR is a fundamental element of sustainable development for society in general and long-term performance for banks in particular because: (i) CSR contributes to the regulation of business entity behavior; (ii) CSR contributes to improving the quality, brand value, and reputation of the bank; and (iii) CSR contributes to increasing profits for the bank, attracting good labor resources, and helping to enhance national image and promote sustainability. In the context of globalization and integration, banks must increase their operational efficiency to remain competitive and maintain their market position (Wu & Shen, 2013; Cornett et al., 2016).

Vietnam is regarded as the next dragon in Asia, with an average GDP growth rate of 6.5% from 2007 to present. The banking sector plays an important role in providing capital to the national economy (Scholtens, 2009). In recent years, Vietnam's banking scandals have involved BCCI, Nam A Bank, Eximbank, and Saigon Commercial Joint Stock Bank and Van Thinh Phat Group. Banks' reputations have suffered. Therefore, CSR activities have been and will continue to be a direct or indirect savior for the bank's development and the sustainability of society as a whole.

In order to anticipate the globalization development trend, Vietnamese banks have invested significantly in a variety of technologies in their products, services, operations, and management over the past few years. The implementation of fundamental digital technologies, such as cloud computing, big data analysis, artificial intelligence, applications and solutions such as biometric authentication, and data exchange, is the most notable aspect. Opened via application program interface (open API) is to improve operational efficiency, enhance customer experience, and strive for green and environmentally favorable products and services (Siueia et al, 2017). In addition, the Vietnamese banking market is relatively competitive between state-owned and privately-owned banks, listed and unlisted banks, and large and small banks. Different banks may pursue distinct business strategies with regard to social responsibility in the pursuit of sustainable development. Consequently, Vietnam presents an interesting case to examine the regulatory role of banking characteristics such as bank ownership, banks listed on the stock exchange or large and small banks, which affects the relationship between social responsibility and operating efficiency in commercial banks.

Our research contributes to the literature in numerous significant ways. Due to data constraints, empirical evidence regarding the regulatory role of banking characteristics in the relationship between social responsibility and performance in the banking sector is scarce (Yen HH, 2020). Moreover, the empirical evidence on the relationship between CSR and banking performance in developed countries is still comparatively fragmented and heterogeneous, according to Scholtens (2009), Wu & Shen (2013), Platonova et al. (2018), Buallay (2019), and Moufty et al. (2021). However, the above studies only refer to external factors of the bank such as environment, society, customers and products. The authors have neglected to mention internal bank factors such as employees and administrators. This is a fundamental aspect and a crucial component of the bank's business model. In addition, the State Bank of Vietnam has not yet issued regulations on standards for applying social responsibility measurement criteria. Therefore, the assessment of CSR at commercial banks is still quite limited and heavily dependent on bank managers' willingness to disclose information about their CSR. Consequently, our research will contribute to the existing literature on CSR measurement in emerging markets, particularly the Asia-Pacific region. Finally, we will examine the relationship between CSR and performance of different banks in terms of characteristics, such as state-owned and privately-owned commercial banks, large and small banks, and listed and unlisted banks. Our research will provide some important implications for other emerging markets in general and Vietnam in particular.

The results indicate that the regulatory role of bank characteristics such as asset size, ownership structure and listing on the stock exchange, which impacts on the relationship of social responsibility and performance in order to help managers have corporate governance on social responsibility as a long-term investment activity to be deployed more aggressively in small banks. More specifically, the more information banks disclose about social responsibility, the greater their operational efficiency, particularly in regards to products, the environment, consumers, partners, the community and society, and managers. For banks with smaller-than-average asset sizes, the more CSR information banks disclose, the greater their operational efficiency. In addition, the same findings are observed in the case of large institutions, where the greater the disclosure of corporate social responsibility, the greater the effectiveness. Meanwhile, the efficacy decreases as the deposit-to-capital ratio rises. This enables bank managers to adapt their business strategies to the actual circumstances of their entities so as to achieve sustainable development objectives.

This study's remainder is structured as follows: part 2 provides a literature overview and hypothesis development, part 3 presents the research methodology, part 4 discusses empirical findings, and part 5 contains conclusions and implications.

2. Literature Overview and Hypothesis Development

2.1. Social responsibility and operating efficiency:

Stakeholder, institutional, agency, legitimacy, and signaling theories have been employed to find answers. OE will improve if banks disclose CSR. Odemilin et al., 2010; Bagh, 2017; Forcadell, 2017; Maqbool, 2018; Wu & Shen, 2013; Gangi, 2018; Siueia, 2019; Szegedi, 2020; Belasri, 2020; Buallay, 2019; and Waheed, 2021. In which 90% of studies used quantitative methods, 10% used qualitative methods (Alshbili & Elamer, 2020; Parsa et al., 2020; and Situ, 2020), and 10% used a mixed method (Dissanayake, 2020). Details are:

Odemilin et al. (2010) in Nigerian commercial banks, Bagh (2017) in Pakistani banks, Forcadell (2017) in 18 European commercial banks, and Maqbool (2018) in 28 Indian commercial banks used reasoning Stakeholder and institutional theory demonstrate that CSR practice improves OC, motivating banks to incorporate CSR into their business strategies.

Wu (2013) and Sharif (2014) found that well-resourced enterprises improve OE, while Sharif (2014) found that managers affect OE. Pakistani businesses' CSR disclosure. Waheed (2012) found that CSR governs organizational culture (OC) in Chinese commercial banks by affecting organizational performance, notably competitive efficiency (CP). The author pointed OE and CSR are positively correlated.

The findings of Belasri's (2020) study of 184 commercial banks in 41 countries during the period 2009-2015 indicate that CSR and OE only appear in developed nations and nations with domestic protection policies and significant expenditure.

Nonetheless, the research group supports theories such as shareholder theory, political cost theory, resource dependency and trade-off theory, which assert that the more firms invest in CSR activities, the more costs and shareholder interests are impacted, resulting in a significant decline in the bank's operational efficiency. Members of the research group pursuing these hypotheses are Soana, 2011; Platonova et al., 2018; Akdogan, 2020; Moufty, 2021; and Buallay, 2021. From 2003 to 2005, Chih (2010) found no correlation between CSR and OE in 520 businesses across 34 countries. However, only 162 of the 520 sample companies are financial institutions in the United States, and only eight of them have CSR ratings. According to Moufty, environmental sustainability neither increases profits nor decreases expenses. Internal social performance increases the profitability, liquidity, job satisfaction, and organizational commitment of a bank. Due to the limited social impact of bank products, external performance hinders operational efficiency. According to Akdogan (2020), CSR and OE differ by country based on social structure and economic development.

"H1: There is a positive relationship between CSR and OE in Vietnamese commercial banks"

2.2. CSR aspects and operating efficiency:

Stakeholder theory (Freeman, 1990) and CSR variables indicate connections with shareholders, partners/suppliers, consumers, products and services, employees, communities and society, the environment, and management. This research recognizes the aforementioned four stakeholder components as four CSR aspects of firms, comparable to empirical studies in developing countries like Commercial bank in Vietnam, to explain the link between CSR and OE. Combining each bank's CSR and OE indication produces CSR-OE connection.

2.2.1. Responsibilities to employees:

All company strategies depend on employees (Tunio, 2021; Malik & Nadeem, 2015), making them essential to corporate operations. Porter's (1980) competitive advantage approach includes price competitiveness, differentiation, and innovation. The human factor, employee loyalty, and the company's employee policy are essential for a company to make a difference and be creative. Numerous empirical research on employee-OE relationships are inconsistent. Studies by Guadamillas –Golmez & Donate-Manzanres, 2011; Carroll, 1991; and Odemilin et al., 2010 consider responsibility to employees one of the ethical aspects in which top leaders of companies make decisions on investment initiatives and policies. Crisóstomo et al., 2011 found that the more responsible companies are with employees, the lower their financial performance because this has increased their costs.

2.2.2. Responsibilities to Product and Customer:

CSR study frameworks by Davenport (2000) and Wood & Jones (1995) include customer care actions include honoring consumer rights, offering exceptional products and services, excellent customer service, and honest product information. CSR improves customer happiness and market value (Soana, 2011). They suggested product quality and CSR innovation to boost consumer satisfaction.

2.2.3. Responsibility to the environment:

Tran (2014) demonstrates how to prioritize the environment, guarantee quality of life, and apply this new trend in compliance with directive 03/CT-NHNN (2015). Green banks use social and environmental issues to evaluate loans and green internal operations. Intangible CSR in the finance sector improves corporate success (Tran, 2014). This research indicates that banks are now addressing CSR problems like green banking and green financing. Green finance symbolizes the nation's globalization. CSR research in the nation is lacking, but businesses, institutions, consumers, and society are increasingly engaged in its growth and application. CSR is growing essential for stakeholder trust and support. Effective CSR implementation helps banks succeed and flourish in a globalized world.

2.2.4. Responsibility to the community:

CSR is related to the community because all stakeholders are members of society. As businesses increase in size, geographic scope, and complexity, businesses prioritize community support to enhance operational efficiency (Naidu & Ranjeeni , 2021). According to Husted (2005), banks benefit from the CSR image of their employees and local communities when they concentrate their social activities on the community and the locality. In contrast, Castka et al (2004) and Mishra & Suar (2010) argue that previous evidence suggests a negative relationship between community responsibility and OE.

"H2: The aspects *of CSR affecting the operational efficiency of Vietnamese commercial banks are positive"*

2.3. Ownership structure and operational efficiency:

State-owned enterprises (SOEs) in emergent economies such as Vietnam are expected to have a social mission. SOEs must meet societal needs or serve more than shareholders. Thus, many subterranean public sector firms include social activities in their objective (Cordeiro et al., 2018). According to Neo-institutional theory (Greenwood & Hinings, 1996), state ownership and CSR engagement are linked since government power requires SOEs to contribute to society's welfare. The banking sector is not an exception. Vietnam has four State-controlled commercial banks. These four banks have approximately

USD 274.5 million in assets as of December 31, 2021, up over four times in 10 years and accounting for over 50% of the banking system's assets. These four banks have a major impact on monetary, banking, and other operations throughout the financial system. State-owned commercial banks may reveal CSR information for the state's benefit. Wang et al. (2014) said state-owned firms often follow government goals. Thus, the State's control over commercial institutions may affect the CSR-OE relationship. State-owned commercial banks and private commercial banks have different governance and performance functions for coordinating and executing State or State Bank policy. Institutional CSR and OE studies in Vietnam are lacking.

"H3: Ownership structure has an impact on the relationship between CSR and OE in Vietnamese commercial *banks"*

2.4. Asset size and operating efficiency:

In Vietnam, most researchers use DEA technique to measure the performance of commercial banks and combine many different methods and techniques such as multivariate regression model, 2SLS method, FEM, REM and GLS aimed to investigate the relationship between asset size and performance, including studies by Dung, L.C. & associates, 2015, Hoang & Huan, 2016, Hau & Quynh, 2017 and Hong et al., 2018. However, the research results are not consistent.

After Circular No. 52/2018/TT-NHNN dated December 31st, 2018 and took effect on April 1st, 2019, commercial bank branches were classified into two categories based on their assets: Few studies in Vietnam examine the link between large-scale commercial banks and small-scale commercial banks.

"H4: Asset *size has an impact on the relationship between CSR and OE in Vietnamese commercial banks"*

3. Research Methodology

3.1. Methodology:

This study uses CSR measurement criteria according to GRI (2016), builds a questionnaire and conducts a survey to collect opinions of 200 banking experts at 30 Vietnamese commercial banks for the purpose of excluding or adding more CSR aspects to suit the economic, cultural and social situation of Vietnam according to the Likert - 5 scale. Then, the analytical method of Cronbach's Alpha scale, EFA is used to test and determine the degree of accuracy and reliability of the scale and eliminate bad factors. Then, we check the linear structural model (SEM) using SPSS 20.0 software. Finally, to calculate the total CSR score, the study uses the results collected from experts to calculate the score and determine the appropriate proportion.

When investigating the determinants of bank profitability, the model incorporates bank-specific and macroeconomic factors in consideration of the literature and the distinctive characteristics of the Vietnamese banking system. Due to the use of panel data in our analysis, Arellano and Bover's (1995) generalized method of moment estimation is employed. This technique addresses two fundamental problems: unobserved heterogeneity and endogeneity. This estimator also takes bank profitability stability into account. As a consequence, this could lead to more accurate and consistent parameter estimations.

The differences in corporate governance among Vietnamese institutions may be subject to unobservable heterogeneity that cannot be accurately measured (Le, 2021). Moreover, the profitability of banks is enduring (Le, 2020; Le and Ngo, 2020).

The author used the multivariate regression method with the most squares (OLS) model. This technique is however susceptible to autocorrelation and variable variance. Therefore, the author has utilized more random effects model (REM) and fixed effect model (FEM) over time. The author selected the optimal model using the F test and the Hausman test in order to determine the optimal model. In the event that the chosen model still has flaws in autocorrelation and/or variable variance, the author will continue to use the GLS model to surmount the aforementioned equations.

3.2. Research models

To examine the relationship between CSR and OE, the author employs the research models of Wu & Shen (2013) and Platonova (2016), as follows:

- $OE_{it} = \lambda_0 + \lambda_1 CSR_{i,t} + \lambda_2 LNSize_{i,t} + \lambda_3 Deposit\_R_{i,t} + \lambda_4 Loan\_R_{i,t} + \lambda_5 Leverage_{i,t} + \theta_i + \varepsilon_{i,t}$ (1)

The author employs the research models of Wu & Shen (2013) and Platonova (2016) to examine the connection between CSR and OE components, as follows:

- $OE_{it} = \lambda_0 + \lambda_1 SHR_{i,t} + + \lambda_2 PN_{i,t} + \lambda_3 CUS_{i,t} + \lambda_4 PRD_{i,t} + \lambda_6 EMP_{i,t} + \lambda_7 COM_{i,t} + \lambda_8 ENV_{i,t} + \lambda_9 MAN_{i,t} + \lambda_{10} LNSize_{i,t} + \lambda_{11} Deposit\_R_{i,t} + \lambda_{12} Loan\_R_{i,t} + \lambda_{13} Leverage_{i,t} + \theta_i + \varepsilon_{i,t}$ (2)

To examine the impact of ownership structure on the relationship between CSR and OE in the banking sector, the author uses the research model of Li (2013) and has the following equations:

- $OE_{it} = \lambda_0 + \lambda_1 SOE * CSR_{i,t} + \lambda_2 LNSize_{i,t} + \lambda_3 Deposit\_R_{i,t} + \lambda_4 Loan\_R_{i,t} + \lambda_5 Leverage_{i,t} + \theta_i + \varepsilon_{i,t}$ (3)

To examine the impact of asset size on the relationship between CSR and OE in the banking sector, the author uses Li's research model (2013) and has the following equations:

- $OE_{it} = \lambda_0 + \lambda_1 BIG * CSR_{i,t} + \lambda_2 LNSize_{i,t} + \lambda_3 Deposit\_R_{i,t} + \lambda_4 Loan\_R_{i,t} + \lambda_5 Leverage_{i,t} + \theta_i + \varepsilon_{i,t}$(4)

3.3. Variables and variable explanations:

Dependent variable (OE): the author will use ROA, ROE and NIM to represent the OE variable. Profitability is one of the goals that both operators and investors care about because high profits will help banks preserve capital, increase market share and attract investment (Wu & Shen, 2013).

- ROA: profit after tax divided by total assets;
- ROE: profit after tax divided by equity;
- NIM: the difference between the organization's net interest income and the budget that the bank has to pay

Control variable:

- LNsize: is the equity coefficient divided by the total capital of NH i at time t
- Deposit_R: is the capital mobilization coefficient divided by the total assets of NH i at time t
- Loan_R: is the customer loan coefficient divided by the total assets of Bank i at time t
- Leverage: is the ratio of total liabilities divided by total capital of Bank i at time t

Regulator variable:

- SOE is a dummy variable and SOE = 1 when commercial banks own capital from the State and SOE = 0 is the remaining commercial banks;
- Big: is a dummy variable and Big = 1 when commercial banks have the average total assets of the quarter in 2021 over 100 thousand billion VND and Big = 0 is the remaining commercial banks;

3.4. Data:

- The sample of 30 banks does not include foreign banks in Vietnam and policy banks.
- Primary and secondary data on CSR and OE are gathered from the annual reports of Vietnamese commercial banks for the years 2017-2021 and published on the banks' websites.
- The research used data from 2017 to 2021 since the world has recently experienced the COVID-19 epidemic and commercial banks have started publishing CSR on yearly reports and disseminating information on their websites, SBV, and in the press.

4. Results and Discussion

4.1. Statistical:

Table 1: Results of component CSR scores and ratio of CSR aspects

Variables	Content	ratio	Score by Likert
SHR	Shareholders	12.5%	858
PN	Partners/Suppliers	12.3%	838
CUS	Customers	12.5%	855

Variables	Content	ratio	Score by Likert
COM	Society and community	11.8%	809
ENV	Environment	12.0%	821
PRD	Products and services	12.9%	882
EMP	Employees	12.9%	879
MAN	Manager	13.1%	898

Source: results from SPSS software

The total number of surveys collected is 200 people, from experts in the banking sector. The author continues to use Cronbach's Alpha test to remove bad variables with measurement variables less than 0.3. The obtained results of all factors have Cronbach's Alpha coefficient > 0.6 (from 0.73 to 0.89) in Table 2.

Table 2: Cronbach's Alpha and EFA results of each CSR dimension

Variable	Detail	Cronbach's Alpha	KMO.	Extracted variance	Eigenvalues
SHR	SHR1, SHR2, SHR4, SHR5, SHR7, SHR8, SHR10	0.742	0.754	50%	2.487
PN	PN1, PN2, PN3, PN5, PN6, PN7	0.826	0.821	56%	3.354
CUS	CUS2, CUS3, CUS4, CUS5, CUS6, CUS7, CUS8, CUS9	0.851	0.842	66%	2.487
COM	COM1, COM2, COM3, COM4, COM5, COM6, COM7, COM8, COM9, COM10	0.896	0.901	52%	5.231
ENV	ENV1, ENV3, ENV4, ENV5, ENV6, ENV7, ENV8	0.899	0.887	63%	4.382
PRD	PRD1, PRD2, PRD3, PRD4, PRD5, PRD6	0.781	0.806	50%	3.017
EMP	EMP1, EMP2, EMP3, EMP4, EMP5, EMP6, EMP9, EMP11, EMP12	0.777	0.792	50%	1,929
MAN	MAN1, MAN3, MAN4, MAN5, MAN6	0.735	0.741	52%	2.616

Source: results from SPSS software

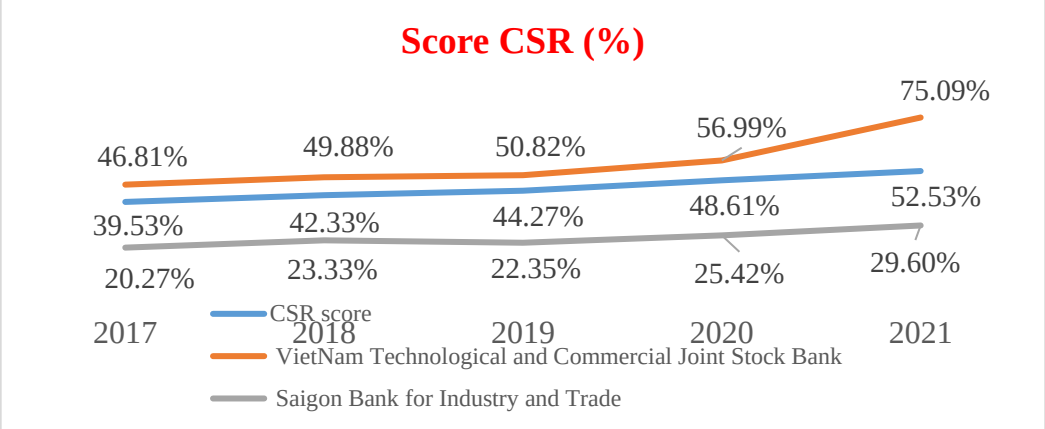

Fig.1: Average CSR scores of banks over the years
Source: compiled from CSR analysis and scoring results

Table 3: CSR score results by each bank over the years

No.	Name Bank	2017	2018	2019	2020	2021
1	TCB	0.4681	0.4988	0.5082	0.5699	0.7490
2	ACB	0.3630	0.3893	0.4450	0.5211	0.6502

No.	Name Bank	2017	2018	2019	2020	2021
3	SCB	0.4900	0.5361	0.5765	0.5969	0.6378
	……..					
28	VPB	0.4466	0.4214	0.4783	0.4137	0.4039
29	PGB	0.2599	0.2813	0.3135	0.2764	0.3182
30	SaigonBank	0.2027	0.2333	0.2235	0.2542	0.2960
	Average score CSR	**0.3953**	**0.4233**	**0.4427**	**0.4861**	**0.5253**

Source: aggregated results from Excel software

In accordance with Table 3, TCB has the highest percentage of CSR information disclosure in 2021 at 74.90%, while SaigonBank has the lowest percentage at 29.60%. CSR scores are above average, particularly in state-owned institutions such as VCB, VTB, BIDV, and Agribank, where they are 58.17%, 63.50%, 50.38%, and 59.5%, respectively. This indicates that state-owned commercial banks are more interested than private banks in CSR disclosure.

Table 4 indicates that TCB disclosed the most CSR information in 2021 at 74.90%, while SaigonBank disclosed the least at 29.60%. State-owned banks including VCB, VTB, BIDV, and Agribank had above-average CSR scores: 58.17%, 63.50%, 50.38%, and 59.5%, respectively. State-owned commercial banks care more about CSR disclosure than private banks.

Table 4: Classification by bank characteristics

	SOE	PRI	Listed	Unlisted	Big	Small
CSR score	0.3750	0.5385	0.5175	0.5152	0.5417	0.4167

Source: aggregated results from Excel software

Table 4 indicate that ownership structure, stock market listing and asset size affect CSR disclosure. Top management of privately owned commercial banks is more concerned with corporate social responsibility than the managers of publicly owned banks. Similarly, banks that are small size and listed on the stock exchange publish more CSR than banks that are large size and not listed on the stock exchange.

Table 5 CSR aspects Score

Items	Mean	Max	Name bank
CSR	0.5600	0.7490	TCB
SHR	0.4989	0.7667	TCB
PN	0.3256	0.8333	TCB
CUS	0.5233	0.8333	SHB
PRD	0.4933	1,0000	Agribank
EMP	0.3922	0.7500	EIB
COM	0.2956	0.6667	TCB
ENV	0.1964	0.6923	SHB
MAN	0.5080	0.8000	VTB

Source: aggregated results from Excel software

According to Table 5, TCB is the leader in disclosing information about many aspects of CSR, including SHR – 76.67%, PN – 83.33%, and COM – 66.67%, while SHB is the leader in CSR disclosure disclosure, including CUS – 83.33% and ENV – 69.23%. This demonstrates that Vietnamese commercial banks have a strong interest in CSR disclosure and CSR-related aspects.

Table 6: Statistics of the study model's variables

Variables	Mean	Max	Min	Std.Dev.
ROA	0.00913	0.03238	0.00011	0.00723
ROE	0.11481	0.32833	0.00403	0.07549

NIM	0.01928	0.05649	0.00305	0.00984
SOE	0.13333	1,00000	-	0.33993
Listed	0.63333	1,00000	-	0.48189
CSR	0.40416	0.74904	-	0.13294
SHR	0.50223	1,00000	-	0.23412
PN	0.33000	0.83330	-	0.24073
CUS	0.52889	0.83330	-	0.23234
PRD	0.50000	1,00000	-	0.21794
EMP	0.39555	0.75000	-	0.14246
COM	0.29834	0.66670	-	0.15994
ENV	0.19691	0.69230	-	0.18236
MAN	0.51200	0.80000	-	0.19525
Lnsize	0.07762	0.16973	0	0.02878
Deposit_R	0.72130	0.92386	0	0.11594
Loan_R	0.63379	0.97952	0.32264	0.10964
Leverage	0.90560	0.97379	0.02986	0.09404

Source: aggregated results from Excel software

Vietnamese commercial banks voluntarily announce social responsibility activities. The average value of the independent variables on CSR index from highest to lowest is 0.5233, 0.5080, 0.4989, 0.4933, 0.4042, 0.3922, 0.3256, 0.2956, and 0.1964 (CUS, MAN, SHR, PRD, CSR, EMP, PN, COM, and ENV). These data indicate that Vietnamese commercial banks' annual reports, sustainability reports, and websites focus on customers, management, shareholders, and products and services. Thus, commercial banks are keen to improve their products and services and educate their management about social responsibility. CUS has 13% variance, 20% MAN, 22% PRD, 24% SHR, and 13% CSR. These numbers indicate that the variance in the level of information provided for each aspect of social responsibility is relatively small.

4.2. Check the correlation between variables

According to Table 7, no pair of variables exceeds 0.8, which means that there is no multicollinearity. To regress the models, the author group conducts testing procedures and selects the most suitable model for the study. With the results of Hausman test showing that Prob > Chi2 = 0.3053, the appropriate REM model is selected. However, the Modified Wald test (Pro>chi2 < 0.05) demonstrates that the variance has changed, and the Wooldridge test (Prob>F<0.05) indicates that it is autocorrelated. We conclude that it is necessary to use the GLS model to overcome these two defects.

Table 7

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	ROA	1															
2	ROE	.861**	1														
3	NIM	.399**	.519**	1													
4	CSR	.276**	.361**	.285**	1												
5	SHR	.108	.115	.174*	.676**	1											
6	PN	.179*	.213**	.189*	.676**	.447**	1										
7	CUS	.223**	.328**	.272**	.818**	.498**	.563**	1									
8	PRD	.261**	.362**	.215**	.676**	.235**	.459**	.506**	1								
9	EMP	.148	.113	.202*	.504**	.266**	.232**	.321**	.165*	1							
10	COM	.203*	.272**	.081	.631**	.291**	.271**	.455**	.355**	.312**	1						
11	ENV	.258**	.310**	.300**	.688**	.288**	.274**	.470**	.427**	.516**	.542**	1					
12	MAN	.064	.155	.034	.479**	.331**	.050	.307**	.255**	.068	.202*	.169*	1				
13	LNSize	.223**	.074	.497**	-.064	.045	-.005	-.066	-.107	.194*	-.148	-.067	-.149	1			
14	Deposit_R	-229**	-.122	-.377**	.178*	-.230**	-.241**	-.104	-.147	-.130	.032	.006	-.033	-.235**	1		
15	Loan_R	.029	.177*	.076	-.029	-217**	-.185*	.028	-.009	-.024	.204*	.200*	-.024	-.026	.589**	1	
16	Leverage	-.005	.031	.010	.219**	.155	.242**	.254**	.200*	-.118	.127	.136	.028	-206*	.008	-.076	1

Source: compiled results from SPSS software

Noted: *ROA*, profit after tax divided by total assets; *ROE*, profit after tax divided by equity; *NIM*, the difference between the organization's net interest income and the budget that the bank has to pay; *CSR*, total score of the bank's social responsibility disclosure; *SHR*, total score of the bank's social responsibility disclosure in terms of shareholders; *PN*, total score of the bank's social responsibility disclosure in terms of partners/ suppliers; *CUS*, total score of the bank's social responsibility disclosure in terms of Customers; *PRD*, total score of the bank's social responsibility disclosure in terms of products and services; *EMP*, total score of the bank's social responsibility disclosure in terms of employees; *COM*, total score of the bank's social responsibility disclosure in terms of community and social; *ENV*, total score of the bank's social responsibility disclosure in terms of environment; *MAN*, total score of the bank's social responsibility disclosure in terms of managers; *LNSize*, the equity coefficient divided by the total capital of bank; *Deposit_R*, the capital mobilization coefficient divided by the total assets of bank; *Loan_R*, the customer loan coefficient divided by the total assets of Bank; *Leverage*, the ratio of total liabilities divided by total capital of Bank.

4.3. Regression results and discussion

Results of testing hypothesis H1, the author has regression equation (1). The results are presented in Table 8.

Variables	Full Samples		
	ROA	**ROE**	**NIM**
CSR	0.028**	0.242*	0.018*
	(3.13)	(4.23)	(3.53)
LNSize	0.093**	0.148	0.157*
	(2.26)	(0.55)	(6.72)
Deposit_R	-0.032**	-0.21**	-0.041*
	(-2.53)	(-2.55)	(-5.67)
Loan_R	0.028**	0.321*	0.038*
	(1.98)	(3.58)	(4.81)
Leverage	-0.001	-0.005	0.009
	(-0.073)	(-0.06)	(1.28)
Cons.	-0.001	-0.026	-0.002
	(-0.34)	(-0.26)	(-0.22)
R-square	0.174	0.212	0.478
Obs.	150	150	150

Noted: *p<0.1, **p<0.05, ***p<0.01

ROA, profit after tax divided by total assets; *ROE*, profit after tax divided by equity; *NIM*, the difference between the organization's net interest income and the budget that the bank has to pay; *CSR*, total score of the bank's social responsibility disclosure; *LNSize*, the equity coefficient divided by the total capital of bank; *Deposit_R*, the capital mobilization coefficient divided by the total assets of bank; *Loan_R*, the customer loan coefficient divided by the total assets of Bank; *Leverage*, the ratio of total liabilities divided by total capital of Bank.

Source: compiled results from Stata software

CSR is statistically significant (equation (1)), hence public opinion is positive when institutions reveal CSR information. CSR and OE have a positive relationship because increasing CSR activities increases overall asset and equity profitability and margins. According to Wu & Shen (2013) and Platonova (2016), historical bank interest rates. At the 5% level, ROA, ROE, and NIM are positively correlated with asset size and lending ratios. The bank's performance inefficiency, which is statistically significant at 5%, increases as the deposit ratio and liabilities to total assets grow.

Table 8 indicates that the ratios of loans, mobilization, and equity to total capital are statistically significant at 5%, indicating that the models are consistent. The equity-to-total equity ratio regression coefficient is positive and significant at 5%. According to Scholtens (2009), major banks are more efficient when they publish CSR. Loan-to-total assets ratio (Loan_R) positively affects bank performance at 5% and 10%. According to Platonnova et al. (2016), commercial banks with greater loan balances and more CSR transparency perform better. Operating efficiency increases with loan-to-total assets ratio (Loan_R) at 5% and 10%. According to Platonnova et al. (2016), commercial banks perform better with higher loan balances and CSR transparency. Deposit_R decreases OE and is statistically significant at 5% and 10%. With the

above results, bank managers must reevaluate their capital mobilization and lending policies and lower this ratio to match their business model. Do not mobilize capital at a rate that hinders business operations.

Results of testing hypothesis H2, the author has regression equation (3). The results are presented in Table 9.

Variables	Full Samples		
	ROA	**ROE**	**NIM**
CSR	0.0206***	0.1902***	0.0395***
	(5.39)	(3.96)	(3.54)
SOE * CSR	-0.0006	0.0323	0.0174
	(-0.21)	(0.81)	(1.34)
Listed * CSR	0.0105***	0.1419***	0.0254***
	(4.08)	(4.42)	(3.33)
Big * CSR	0.0096**	0.0758	-0.0007
	(2.18)	(1.35)	(-0.08)
LNSize	0.095*	0.2540	0.0905*
	(6.75)	(1.14)	(1.75)
Deposit_R	-0.0112**	-0.0907	-0.0547***
	(-2.21)	(-1.43)	(-3.71)
Loan_R	0.095*	0.1429**	0.0484**
	(1.77)	(2.11)	(3.08)
Leverage	-0.0026	-0.0270	-0.0216
	(-0.52)	(-0.42)	(-1.46)
Const.	-0.0040	0.0154	0.0286
	(-0.63)	(0.19)	(1.55)
R-square	0.4321	0.2726	0.2974
Obs.	150	150	150

Noted: * p< 0.1, ** p< 0.05, *** p< 0.01

ROA, profit after tax divided by total assets; *ROE*, profit after tax divided by equity; *NIM*, the difference between the organization's net interest income and the budget that the bank has to pay; *CSR*, total score of the bank's social responsibility disclosure; *SOE*, a dummy variable and SOE = 1 when commercial banks own capital from the State and SOE = 0 is the remaining commercial banks; *Big*, a dummy variable and Big = 1 when commercial banks have the average total assets of the quarter in 2021 over 100 thousand billion VND and Big = 0 is the remaining commercial banks; *Listed*, a dummy variable and Listed = 1 when commercial banks has listed on the stock market and Listed = 0 is the remaining commercial banks; *LNSize*, the equity coefficient divided by the total capital of bank; *Deposit_R*, the capital mobilization coefficient divided by the total assets of bank; *Loan_R*, the customer loan coefficient divided by the total assets of Bank; *Leverage*, the ratio of total liabilities divided by total capital of Bank.

Source: compiled results from Stata software

The results of testing hypothesis H2, the author has regression equation (2) and obtained the results as presented in Table 10.

Variables	Full samples		
	ROA	**ROE**	**NIM**

SHR	-0.004	-0.027	0.011
	(-0.60)	(-0.684)	(0.01)
PN	0.001	0.016	0.004
	(0.23)	(0.39)	(-0.10)
CUS	0.004	0.062	0.008
	(0.63)	(1.36)	(1.92)
PRD	0.009	0.085**	0.002
	(1.35)	(2.06)	(0.64)
EMP	-0.008	-0.064	-0.007
	(-0.79)	(-1.01)	(-1.28)
COM	0.008	0.04	-0.008
	(0.93)	(0.70)	(-1.58)
ENV	0.014	0.067	0.016*
	(1.53)	(1.18)	(3.26)
MAN	0.016	0.027	0.018
	(0.01)	(0.64)	(-0.05)
LNSize	0.115*	0.33	0.163*
	(2.64)	(1.18)	(6.73)
Deposit_R	-0.03**	-0.191**	-0.04*
	(-2.30)	(-2.32)	(-5.66)
Loan_R	0.015	0.251**	0.032*
	(1.01)	(2.58)	(3.86)
Leverage	-0.005	-0.044	0.005
	(-0.40)	(-0.521)	(0.67)
Const	0.011	0.043	0.008
	(0.65)	(0.39)	(0.89)
R-square	0.206	0.256	0.523
Obs.	150	150	150

Noted: * p< 0.1, ** p< 0.05, *** p< 0.01

ROA, profit after tax divided by total assets; *ROE*, profit after tax divided by equity; *NIM*, the difference between the organization's net interest income and the budget that the bank has to pay; *CSR*, total score of the bank's social responsibility disclosure; *SHR*, total score of the bank's social responsibility disclosure in terms of shareholders; *PN*, total score of the bank's social responsibility disclosure in terms of partners/ suppliers; *CUS*, total score of the bank's social responsibility disclosure in terms of Customers; *PRD*, total score of the bank's social responsibility disclosure in terms of products and services; *EMP*, total score of the bank's social responsibility disclosure in terms of employees; *COM*, total score of the bank's social responsibility disclosure in terms of community and social; *ENV*, total score of the bank's social responsibility disclosure in terms of environment; *MAN*, total score of the bank's social responsibility disclosure in terms of managers; *LNSize*, the equity coefficient divided by the total capital of bank; *Deposit_R*, the capital mobilization coefficient divided by the total assets of bank; *Loan_R*, the customer loan coefficient divided by the total assets of Bank; *Leverage*, the ratio of total liabilities divided by total capital of Bank.

Source: compiled results from Stata software

The regression findings of equation (2) in table 10 indicate that CSR evidence connected to product and environment improves operational efficiency by 5% to 10%. According to Bătae et al. (2021),

commercial banks are always interested in product and environmental responsibility disclosure. Commercial banks do not disclose CSR to shareholders, partners, customers, workers, management, the community, or society, and are not consistent with the views of Gangi et al (2018).

4.4. Robustness checks

To ensure the accuracy of the regression results when taking the delay factor into consideration. This study also retests the phenomenon of correlation of multicollinearity by counting on the coefficient results of the analysis of the correlation and table 11 displays the level of between the independent and dependent variables for the time period (2017–2021). After that, the study conducted to check the problem of multicollinearity through the VIF coefficient and the difference (tolerance) and the results from Table 11 indicated that no robustness exists in all four regression models because of VIF < 2.

Table 11 Checking for robustness checks using VIF and IM – Test, white

Variable	CSR	LNSize	Deposit_R	Loan_R	Leverage	Mean
VIF	1.112	1.133	1.748	1.598	1.104	1.339
Chi2 (20) = 35.57 and Prob > chi2 = 0.0173						

Noted: *CSR*, total score of the bank's social responsibility disclosure; *LNSize*, the equity coefficient divided by the total capital of bank; *Deposit_R*, the capital mobilization coefficient divided by the total assets of bank; *Loan_R*, the customer loan coefficient divided by the total assets of Bank; *Leverage*, the ratio of total liabilities divided by total capital of Bank;

Source: compiled results from Stata software

The results of Table 11 indicate that VIF < 2, so there is no multicollinearity phenomenon. The author uses IM-test, white to check whether the variance of the research model changes or not

The findings indicate a variable variance phenomenon; hence the author uses the REM and FEM. F test and Hausman test were used to choose the best model. If the chosen model still has autocorrelation and/or variable variance issues, the author uses the GLS model to overcome the equations, as shown in Table 12:

Varaibles	OLS	FEM	REM	GLS
CSR	0.0204***	0.0160***	0.0163***	0.0172***
	[5.70]	[4.99]	[5.42]	[6.56]
Lnsize	0.121***	0.0730***	0.0920***	0.129***
	[7.13]	[2.99]	[4.52]	[8.16]
Loan_R	0.00923*	0.0176**	0.0129**	0.0127***
	[1.80]	[2.45]	[2.17]	[2.99]
Deposit_R	-0.0112**	-0.00200	-0.00410	-0.0125***
	[-2.22]	[-0.45]	[-0.99]	[-3.38]
Leverage	-0.00273	-0.000929	-0.000519	-0.00155
	[-0.54]	[-0.25]	[-0.14]	[-0.55]
Cons	-0.00375	-0.0119*	-0.00932*	-0.00591
	[-0.61]	[-1.89]	[-1.67]	[-1.47]
Obs	150	150	150	150
R square	0.432	0.271		
Noted: * p < 0.1, ** p < 0.05, *** p < 0.01				

Noted: *CSR*, total score of the bank's social responsibility disclosure; *LNSize*, the equity coefficient divided by the total capital of bank; *Deposit_R*, the capital mobilization coefficient divided by the total assets of bank; *Loan_R*, the customer loan coefficient divided by the total assets of Bank; *Leverage*, the ratio of total liabilities divided by total capital of Bank;

Source: compiled results from Stata software

The research uses banks with a greater total asset-to-equity ratio than the average in 2021 to compare the business strategies of big and small commercial banks. Tables 13 and 14 show regression results:

Table 13: Regression results with bigger assets over equity than average

Varaibles	**Assets/Equity > Average**			
	OLS	**FEM**	**REM**	**GLS**
CSR	0.00759**	0.00997**	0.0102***	0.00402**
	[2.44]	[2.63]	[3.22]	[1.99]
Lnsize	0.0447	0.0518	0.0467	0.0298
	[1.39]	[0.85]	[1.23]	[1.45]
Loan_R	0.0143***	-0.00749	0.00792	0.0142***
	[3.16]	[-0.61]	[1.39]	[7.17]
Deposit_R	-0.000404	0.0171**	0.00590	-0.000711
	[-0.10]	[2.38]	[1.17]	[-0.36]
Leverage	-0.00179	-0.00500	-0.00258	-0.00141
	[-0.57]	[-1.36]	[-0.81]	[-0.57]
Cons	-0.00785	-0.00574	-0.00899*	-0.00591*
	[-1.61]	[-0.73]	[-1.70]	[-1.87]
Obs	70	70	70	70
R square	0.281	0.279		

Noted: * p < 0.1, ** p < 0.05, *** p < 0.01

CSR, total score of the bank's social responsibility disclosure; *LNSize*, the equity coefficient divided by the total capital of bank; *Deposit_R*, the capital mobilization coefficient divided by the total assets of bank; *Loan_R*, the customer loan coefficient divided by the total assets of Bank; *Leverage*, the ratio of total liabilities divided by total capital of Bank;

Table 14: Regression results with smaller assets over equity than average

Varaibles	**Assets/Equity ≤ average**			
	OLS	**FEM**	**REM**	**GLS**
CSR	0.0220***	0.0206***	0.0214***	0.0252***
	[3.51]	[3.51]	[3.91]	[5.09]
Lnsize	2.912	20.84	4.969	2.544**
	[0.95]	[1.00]	[0.73]	[2.47]
Loan_R	0.00334	0.0340***	0.0248***	0.000404
	[0.42]	[3.76]	[3.09]	[0.06]
Deposit_R	-0.0160*	-0.00904	-0.0107**	-0.0123**
	[-1.98]	[-1.64]	[-1.99]	[-2.13]
Leverage	2.848	20.76	4.898	2.472**
	[0.93]	[1.00]	[0.72]	[2.37]
Cons	-2.841	-20.77	-4.909	-2.468**
	[-0.93]	[-1.00]	[-0.73]	[-2.37]

Obs	80	80	80	80
R square	0.348	0.422		

Noted: * p < 0.1, ** p < 0.05, *** p < 0.01

CSR, total score of the bank's social responsibility disclosure; *LNSize*, the equity coefficient divided by the total capital of bank; *Deposit_R*, the capital mobilization coefficient divided by the total assets of bank; *Loan_R*, the customer loan coefficient divided by the total assets of Bank; *Leverage*, the ratio of total liabilities divided by total capital of Bank;

Source: compiled results from Stata software

The regression findings of the two models above indicate that banks with total assets to equity size smaller than or equivalent to the typical commercial bank divulge more CSR information. Then, it outperforms commercial banks with a statistically significant 1% above-average total assets-to-equity ratio. It cannot be shown that commercial banks with a higher-than-average asset-to-equity ratio reveal less CSR yet enjoy the confidence and loyalty of parties, customers, suppliers/partners, and employees. CSR disclosures also improve these institutions' operations. However, banks with lower asset-to-equity ratios benefit more from CSR disclosures.

5. Conclusive Remarks

This research examines CSR and CSR aspects impacting Vietnamese commercial bank performance and finds empirical evidence in 2017–2021. The authors also investigate banking characteristics including ownership structure, stock market listing, and the size of the impact. How up CSR and OE relationship. Finally, the authors compare two models of commercial banks with total assets to equity less than or equal to the average of commercial banks and commercial banks with total asset size. CSR impacts OE differently for banks with higher asset-to-equity. Key research findings are as follows:

The research discovered a 39.53%, 42.33%, 44.27%, 48.61%, and 52.53% growth in bank CSR disclosure over time. This demonstrates that banks value CSR disclosure and appreciate its advantages. CSR disclosure in the Vietnamese banking industry is 52.53%, 63% lower than that of stock exchange-listed enterprises (Anh HT, 2018). Therefore, BODs of commercial banks need to pay attention and disclose a lot of information about social responsibility. In addition, policy makers need to enact or revise regulations that require commercial banks to be responsible for disclosing a wide range of information about social responsibility according to a common standard.

Second, the research indicated that bank characteristics such ownership structure, asset size, and stock market listing affect CSR disclosure. BODs of private commercial bank care more about CSR disclosure than state-owned banks. Commercial banks with greater assets are also more likely to provide CSR information. In Vietnam, the State Bank has issued regulations such as Circular No. 52/2018/TT-NHNN dated December 31st, 2018 to classify commercial banks by large and small scale. However, this regulation does not have guidelines or policies that differ between banks such as LDR ratio, loan or deposit growth rate. Therefore, policy makers need to consider amending or changing this regulation to apply to commercial banks of different sizes, to encourage small-sized banks to gradually encourage them in order to become banks with larger scale and enjoy better preferential policies.

Thirdly, the study found empirical evidence that CSR improves operational efficiency with a statistical significance of 1%. The more commercial banks disclose CSR, the more effective they will be for banks, supporting Scholtens (2009). According to Platonnova et al. (2016), banks with greater loan-to-total asset ratios and more CSR information perform better. However, commercial banks with larger capital mobilization to total capital have inferior operational efficiency, statistically significant between 5% and 10%. This implies that BODs of commercial banks should provide mobilization and lending policies at a

reasonable level and should not increase the mobilization too high while the loan is not available. This can increase capital costs and reduce operational efficiency.

CSR components such as product and environment positively affect OE and are statistically significant at the 5% level. Partners, consumers, products, society, community, and management also improve performance, but are not statistically significant. Commercial banks are concerned about product and environmental responsibility because customers are concerned about banking products and services and they may be penalised for environmental violations.

However, regulatory bank characteristics like asset size, ownership structure, and stock market listing have a beneficial effect on the link between CSR and OE. Commercial banks with state capital and stock market listings reveal more CSR information and perform better than those with low assets, private capital, and others. No stock exchange-listed commercial institutions.

Finally, commercial banks with higher total assets on equity have a different business model than the average commercial bank in 2021. CSR transparency improves performance. The research also revealed that commercial banks with total assets-to-equity ratios below the average share more information. . CSR is more effective at enhancing performance than commercial banks whose total assets to equity ratio is statistically significant at 1% level. Besides, the greater the CSR disclosure, the more effective it is for banks with a lesser total assets-to-equity ratio than the average, resulting in greater efficiency than banks with total assets.

Our research contributes to the body of knowledge in a number of substantial ways. This study presents a unique CSR measurement approach using quantitative and qualitative methods. Second, Haniffa's (2002) unweighted disclosure index is not used to generate CSR's overall score. Instead, we divide the sum of component scores by the sum of component scores to generate CSR weights and scores. The unweighted index technique hides the significance of managers and workers. Two important aspects affect a business's success or efficiency. Thirdly, Vietnam CSR reduces risk. Thus, Vietnamese commercial banks can invest more in CSR to improve their image, reputation, and stakeholder, customer, investor, and partner loyalty. Depending on the bank’s business model, top management might create CSR plans to help their institutions operate more effectively and achieve sustainable objectives. The research also demonstrates that asset size, ownership structure, and stock market listing regulate CSR and OE. This would enable senior management of commercial banks with different characteristics to ponder CSR governance policy and amend, augment, and perceive CSR operations as possible long-term investment activities to be deployed more aggressively in small banks.

This study has time limitations and has not considered foreign banks operating in Vietnam. In addition, in Vietnam, there is no regulation to measure the social responsibility of commercial banks. Future studies can use the above analysis results to expand the sample of commercial banks in different countries or can expand more observations, the research model may be more comprehensive and complete.

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