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The Relationship Between Liquidity, Sustainable Development, and Profitability of Commercial Banks: Empirical Evidence from Listed Banks on The Vietnam Stock Market

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Abstract

This study examined how liquidity and sustainable development (ESG) affect the profitability of 27 Vietnamese commercial banks from 2019-2023, using panel regression models. Key findings indicate that ESG factors have no significant impact on Return on Assets (ROA) or Return on Equity (ROE). However, liquidity and leverage management are crucial. A higher Loan-to-Deposit Ratio (LDR) positively impacts profitability, underscoring the importance of efficient lending. Conversely, a higher Debt-to-Asset Ratio (DAR) negatively affects ROE, highlighting the risks of excessive leverage. The Capital-to-Deposit Ratio (CDR) showed no significant effect The study recommends that regulators and bank managers prioritize strengthening core lending operations and prudent leverage management to enhance the Vietnamese banking system's financial stability.

Keywords: Liquidity, Sustainable Development, Environmental, Social, Governance.

1. Introduction

In the dynamic and often volatile landscape of the global economy, the banking sector stands as a critical pillar of financial stability and economic growth. For Vietnamese commercial banks, navigating this environment requires a sophisticated balancing act between ensuring immediate financial health and building a foundation for long-term resilience. Two factors have emerged as paramount in this endeavor: liquidity and sustainable development (Aassouli et al., 2018). Liquidity, the lifeblood of any financial institution, dictates a bank's ability to meet its short-term obligations and manage market shocks. Simultaneously, the global shift towards sustainability, encapsulated by Environmental, Social, and Governance (ESG) principles, is reshaping corporate responsibility, investor expectations, and long-term value creation.

While numerous studies have explored the determinants of bank profitability in Vietnam, most have examined liquidity and sustainable development in isolation. Research has traditionally focused on the critical role of liquidity management in mitigating risk, or, more recently, on the nascent adoption of ESG practices. However, a significant gap exists in understanding the combined and interrelated effects of these two powerful forces on the financial performance of banks. How does the imperative to maintain robust liquidity interact with the strategic, and often costly, commitment to sustainability? Does excelling in one area compensate for or compromise performance in the other?

This study aims to bridge that gap by providing a comprehensive empirical analysis of how both liquidity and sustainable development jointly impact the profitability of commercial banks listed on the Vietnam stock market. By analyzing data from listed commercial banks, this paper seeks to answer the following critical questions:

- To what extent do specific liquidity metrics, such as the loan-to-deposit ratio and cash-to-asset ratio, influence bank profitability in the current Vietnamese context?
- Does a demonstrated commitment to sustainable development and ESG principles translate into tangible financial returns for Vietnamese banks?

The findings of this research are intended to offer significant contributions. For bank managers and strategists, it will provide data-driven insights to help optimize the trade-offs between liquidity risk and sustainable investments. For policymakers and regulators, it will offer a clearer evidence base for designing frameworks that foster a banking system that is not only profitable and stable but also socially responsible and environmentally conscious. Ultimately, this study provides a holistic perspective on the key drivers of modern banking success in one of Southeast Asia's most vibrant economies.

2. Literature review

2.1. Theoretical Framework

The relationship between a bank's liquidity, its commitment to sustainable development, and its ultimate profitability is underpinned by several core economic and organizational theories. These frameworks provide the lens through which we can understand the strategic choices and financial outcomes of commercial banks.

Theories of Sustainability and Corporate Responsibility:

- Stakeholder Theory (Freeman & Phillips, 2002): This theory posits that a firm's success depends on its ability to manage and balance the interests of all its stakeholders—not just shareholders, but also customers, employees, suppliers, the community, and the environment. In banking, this means that pursuing sustainable development through Environmental, Social, and Governance (ESG) initiatives is not merely an ethical choice but a strategic one. By addressing the broader concerns of society, banks can enhance their reputation, build customer loyalty, attract socially responsible investment, and foster a more stable operating environment, all of which can indirectly boost long-term profitability.
- Legitimacy Theory (Dowling & Pfeffer, 1975): Organizations strive to operate within the bounds and norms of their society to maintain "legitimacy." In an era of heightened awareness about climate change and social inequality, banks that actively engage in and report on their ESG performance are seen as more legitimate. This social license to operate can translate into tangible benefits, such as a lower cost of capital, reduced regulatory scrutiny, and stronger brand equity. The voluntary disclosure of ESG activities, as seen in many Vietnamese banks' annual reports, is a direct attempt to build and maintain this legitimacy.
- Agency Theory (Meckling & Jensen, 1976): This theory explores the potential conflict of interest between a company's management (agents) and its shareholders (principals). Managers may be incentivized to focus on short-term profits at the expense of long-term, value-creating investments like sustainability initiatives, which often have delayed returns. However, strong corporate governance (the 'G' in ESG) can help align these interests, ensuring that management's decisions serve the long-term sustainable growth of the bank, thereby maximizing shareholder value over time.

Theories of Liquidity Management:

- Liquidity Preference Theory (Pigou, 1936): This foundational theory highlights the trade-off between holding liquid assets (like cash) and investing in less liquid, higher-yielding assets. Banks must

constantly balance the need for liquidity (to meet depositor withdrawals and other obligations) against the desire for profitability (earned from loans and other investments).

● Liquidity Risk Theory (Acerbi & Scandolo, 2008): This theory directly addresses the dangers of mismanaging the liquidity-profitability trade-off. Insufficient liquidity can lead to a bank run or force the fire-sale of assets at a loss, potentially leading to insolvency. Conversely, excessive liquidity means forgoing profitable lending and investment opportunities, thus depressing returns. Effective liquidity management is therefore a cornerstone of sound banking.

2.2. Empirical Evidence on Sustainable Development and Profitability

The empirical link between ESG performance and bank profitability has been a subject of growing interest, with findings varying across markets and methodologies.

International Studies: Globally, a consensus is emerging that sustainability is not a detriment to financial performance. Scholtens (2019) found that banks with higher sustainability scores exhibited lower default risk and contributed less to systemic financial risk. This suggests that ESG is a proxy for superior management and risk control. Similarly, Cantero Sáiz et al. (2023) provided evidence that sustainable banks tend to be more profitable. Research by Khezri et al. (2024) noted that while initial investments in sustainability may temper short-term profits, they lead to long-term benefits such as enhanced reputation and better access to green capital. For emerging markets, Tawfik et al. (2021) confirmed a positive relationship, though the strength of the effect varied by country and bank type.

Studies in Vietnam: In Vietnam, research on this topic is more nascent but points in a similar direction. Đỗ Thị Mộng Thường et al. (2023) discovered a positive link between ESG activities and financial performance, particularly for larger banks with more resources to invest in sustainability. Likewise, Nguyễn Chí Đức & Phạm Thị Thuý An (2023) concluded that corporate social responsibility enhances long-term business results and brand value. However, researchers like Bùi Thị Thu Loan et al. (2024) caution that ESG disclosure in Vietnam remains largely voluntary and lacks standardization, which presents challenges for robust empirical analysis.

2.3. Empirical Evidence on Liquidity and Profitability

The relationship between liquidity and profitability is one of the most studied topics in banking, yet the findings remain complex and often contradictory.

International Studies: Some studies find a positive relationship. Gatimu (2019) and Macharia (2013) argued that effective liquidity management, by ensuring stability and confidence, can actually enhance profitability. Other studies find the classic negative trade-off. For instance, many analyses show that higher holdings of liquid assets are associated with lower ROA and ROE. Research by Mashrur and Tabassum (2023) in Bangladesh found a mixed impact, where certain liquidity ratios like the Loan-to-Deposit Ratio (LDR) and the Debt-to-Asset Ratio (DAR) significantly influenced profitability while others did not, suggesting the relationship is nuanced.

Studies in Vietnam: The Vietnamese context reflects this complexity. Tran Quoc Thinh et al. (2022) found a generally positive relationship between liquidity and profitability indicators. In contrast, Nguyễn Đăng Khoa et al. (2023) demonstrated that liquidity risk (the danger of a shortfall) has a significant negative impact on the operational efficiency of banks. Taking a different approach, Lê Đồng Duy Trung (2020) identified a non-linear "threshold" effect, where profitability falls sharply if liquidity risk surpasses a certain point. Interestingly, Le Thanh Tam & Nguyen Anh Tu (2017) found no evidence of a trade-off, suggesting that the most profitable banks in their sample were also able to maintain safe liquidity levels.

2.4. Empirical Evidence on Capital Structure and Profitability

The relationship between a bank's capital structure and its profitability is crucial, with various ratios reflecting different aspects of financial strength and risk.

International Studies: While extensive research exists on various capital ratios, the Capital-to-Deposit Ratio (CDR) specifically examines how much of a bank's funding comes from equity relative to its deposits (Abba et al. 2018). Generally, a higher CDR can indicate a more conservative funding structure, potentially reducing reliance on volatile wholesale funding and enhancing stability. However, a very high CDR might also suggest less leverage, which could, in some contexts, lead to lower returns on equity (Koutmos & Saidi,1995). Studies often explore the trade-off between risk mitigation through higher capital and the potential for reduced financial leverage to generate higher profits. For example, some research suggests that adequate capital acts as a buffer against shocks, leading to more stable long-term profitability, while others point to an inverse relationship where very high capital levels might dilute returns.

Studies in Vietnam: In Vietnam, the impact of capital structure, including ratios like CDR, on bank profitability is an evolving area of research (Pham et al., 2022). Vietnamese banks have undergone significant capital strengthening in recent years. Studies often examine how increased capitalization influences risk-taking behavior and ultimately profitability. While specific research focusing solely on the direct impact of CDR on profitability might be limited, broader analyses of capital adequacy ratios (like CAR) often suggest that well-capitalized banks are better positioned to withstand economic downturns and maintain consistent profitability, though the optimal level remains a subject of debate (NGO et al., 2020). The influence of regulatory requirements on capital ratios and their subsequent effect on profitability is also a key area of inquiry within the Vietnamese banking sector.

Hypothesis H1: Sustainable development positively impacts the profitability of commercial banks.

Hypothesis H2a: The Loan-to-Deposit Ratio (LDR) positively impacts the profitability of commercial banks.

Hypothesis H2b: The Debt-to-Asset Ratio (DAR) positively impacts the profitability of commercial banks.

Hypothesis H2c: The Capital-to-Deposit Ratio (CDR) impacts the profitability of commercial banks.

3. Methodology

3.1. Research Approach and Design

This study employs a quantitative research approach to empirically examine the impact of liquidity and sustainable development on the profitability of commercial banks in Vietnam. The research design is centered on the analysis of balanced panel data, which allows for the observation of multiple banks over a specific period, thereby controlling for both individual bank-specific effects and time-variant macroeconomic factors.

3.2. Sample Selection and Data Collection

The research sample consists of 27 commercial banks officially listed on Vietnam's three main stock exchanges: the Ho Chi Minh Stock Exchange (HOSE), the Hanoi Stock Exchange (HNX), and the Unlisted Public Company Market (UPCoM). This selection ensures that the data is publicly available, audited, and transparent, reflecting the operational realities of a significant portion of the Vietnamese banking sector.

Time Period: The study covers a five-year period from 2019 to 2023. This timeframe is strategically chosen as it encompasses a period of significant economic turbulence, including the global COVID-19 pandemic and the subsequent economic recovery. It is also a period during which Vietnamese

companies, including banks, began to more formally integrate and report on sustainability and ESG issues, spurred by regulations such as Circular 96/2020/TT-BTC from the Ministry of Finance.

Data Sources: Secondary data was meticulously collected from several reliable sources:

- Financial Data: Sourced from audited annual financial statements of the sampled banks.
- Sustainability Data: Gathered through a content analysis of the banks' annual reports and separate sustainability reports (if available).
- Macroeconomic Data: The annual GDP growth rate for Vietnam was obtained from the General Statistics Office of Vietnam (GSO).

3.3. Research Model and Variables

To test the research hypotheses, two primary regression models were developed, using Return on Assets (ROA) and Return on Equity (ROE) as the key indicators of profitability. The models are specified as follows:

Model 1 (ROA):

$$ROA_{i,t} = \beta_0 + \beta_1 LDR_{i,t} + \beta_2 DAR_{i,t} + \beta_3 CDR_{i,t} + \beta_4 ESG_{i,t} + \beta_5 Size_{i,t} + \beta_6 GDP_t + \beta_7 BoardSize_{i,t} + \beta_8 Bachelor_{i,t} + \beta_9 Master_{i,t} + \beta_{10} PhD_{i,t} + \varepsilon_{i,t}$$

Model 2 (ROE):

$$ROE_{i,t} = \beta_0 + \beta_1 LDR_{i,t} + \beta_2 DAR_{i,t} + \beta_3 CDR_{i,t} + \beta_4 ESG_{i,t} + \beta_5 Size_{i,t} + \beta_6 GDP_t + \beta_7 BoardSize_{i,t} + \beta_8 Bachelor_{i,t} + \beta_9 Master_{i,t} + \beta_{10} PhD_{i,t} + \varepsilon_{i,t}$$

Where:

- i represents the bank and t represents the year.
- β_0 is the intercept.
- β_{1-10} are the regression coefficients.
- $\varepsilon_{i,t}$ is the error term.

The variables are defined and measured as follows:

Table 3.3. Variable explanation

Variable Type	Variable Name	Abbreviation	Measurement
Dependent	Return on Assets	ROA	Net Profit After Tax / Total Assets
	Return on Equity	ROE	Net Profit After Tax / Total Equity
Independent	Loan to Deposit Ratio	LDR	Total Customer Loans / Total Customer Deposits

	Deposit to Asset Ratio	DAR	Total Customer Deposits / Total Assets
	Cash to Deposit Ratio	CDR	Cash and Cash Equivalents / Total Assets
	Sustainable Development	ESG	A dummy variable: 1 if the bank publishes a sustainability report or its annual report covers all three E, S, and G pillars; 0 otherwise.
Control	Bank Size	Size	Natural logarithm of Total Assets (ln(Total Assets))
	Economic Growth	GDP	Annual GDP Growth Rate of Vietnam (%)
	Board Size	BoardSize	Total number of members on the Board of Directors
	Board Education	Bachelor, Master, PhD	Number of board members holding a Bachelor's, Master's, or PhD degree, respectively.

Source: Author's calculation

3.4. Data Analysis Techniques

The collected panel data was analyzed using the Python programming language, primarily with the panda's library for data manipulation and stats models and linear models for econometric analysis. The analysis followed a systematic, multi-step process to ensure the robustness and reliability of the results:

3.4.1. Descriptive Statistics: An initial analysis was conducted to summarize the main characteristics of the data, including the mean, standard deviation, and minimum/maximum values for each variable. This provided a foundational understanding of the dataset's distribution.

3.4.2. Panel Regression Model Selection: A comparative approach was used to select the most appropriate panel data regression model. This involved three key steps: Model Estimation: Three distinct models were estimated for comparison: the Pooled Ordinary Least Squares (OLS) model, which serves as a baseline; the Fixed Effects Model (FEM), which controls for time-invariant, bank-specific characteristics; and the Random Effects Model (REM); Model Selection Test: The Hausman test was the crucial decision tool. This test was formally conducted to compare the Fixed Effects Model (FEM) and the Random Effects Model (REM).

4. Results

4.1. Descriptive Statistics

The descriptive statistics for the 135 bank-year observations are summarized in Table 4.1 of the original study. The average Return on Assets (ROA) was 1.16%, while the average Return on Equity (ROE) was significantly higher at 13.02%, indicating that, on average, the banks were more effective at generating profit from their equity base than from their total assets.

Table 4.1. Descriptive statistics

Variable	Observations	Mean	Standard deviation	Min	Max
ESG	135	0.5704	0.4969	0	1
BoardSize	135	7.1259	1.6546	5	12
Bachelor	135	2.4963	1.2922	0	6
Master	135	3.2593	1.5500	1	8
PhD	135	1.0889	0.8147	0	4
ROA	135	0.0116	0.0075	-0.0070	0.0324
ROE	135	0.1302	0.0704	-0.1314	0.2639
LDR	135	0.7868	0.1107	0.4970	1.0030
DAR	135	0.8146	0.0569	0.6435	0.9213
CDR	135	0.1593	0.0604	0.0539	0.4256
Size	135	19.2757	1.0837	16.9430	21.5566
GDP	135	5.1900	2.2741	2.5500	8.1200

Source: Author's calculation

Regarding the key independent variables, the average Loan to Deposit Ratio (LDR) was 78.68%, and the average Deposit to Asset Ratio (DAR) was 81.46%, suggesting a high reliance on deposits to fund lending activities. The average Cash to Deposit Ratio (CDR) stood at 15.93%. For the sustainable development variable, the mean value for the ESG dummy was 0.57, indicating that in 57% of the observations, banks had formal ESG reporting in place. The control variables showed that the average bank size (ln(Assets)) was 19.28, and the average annual GDP growth during the period was 5.19%.

4.2. Correlation and Multicollinearity Diagnostics

Prior to regression analysis, a correlation matrix was examined to assess the initial relationships between variables. Preliminary checks indicated logical correlations, such as a positive relationship between bank size, ESG reporting, and profitability. To ensure the reliability of the regression model, a multicollinearity test was conducted using the Variance Inflation Factor (VIF). As shown in Table 4.2, all VIF values were below the critical threshold of 10, confirming that multicollinearity was not a significant issue in the model.

Table 4.2. VIF analysis

Variable	VIF	1/VIF
BoardSize	7.71	0.129701
Master	6.38	0.156804

Bachelor	3.94	0.254059
PhD	2.91	0.344025
Size	2.75	0.364103
LDR	2.04	0.49047
ESG	1.84	0.544527
DAR	1.71	0.585035
CDR	1.67	0.60054
GDP	1.05	0.955287
Mean VIF	3.2	

Source: Author's calculation

4.3. Regression Analysis Results

Table 4.3.1. displays the results of three regression models (Pooled OLS, Random Effects, and Fixed Effects) used to analyze the factors influencing a bank's Return on Assets (ROA).

Across all three models, the most notable result is the statistically significant and positive impact of the Loan-to-Deposit Ratio (LDR) on ROA. The coefficient is consistently around 0.0125-0.0128 with a p-value of 0.001, indicating that banks with higher LDRs tend to be more profitable.

Conversely, none of the other variables—including the primary independent variable ESG, other financial ratios (DAR, CDR), or the various control variables (Size, GDP, BoardSize, and education levels)—show a statistically significant relationship with ROA in any of the models. Their p-values are all well above the conventional 0.05 threshold.

The R-squared values indicate that the models explain between 28.8% and 35.4% of the variation in ROA.

Table 4.3.1. Full Model Comparison for ROA

Variable	Pooled OLS	Random Effects	Fixed Effects
ESG	**0.0004**	**0.0003**	**0.0003**
	(0.706)	(0.803)	(0.814)
LDR	**0.0125***	**0.0128***	**0.0128***
	(0.001)	(0.001)	(0.001)
DAR	**-0.0019**	**0.0033**	**0.0034**

	(0.866)	(0.791)	(0.785)
CDR	**0.0015**	**0.0008**	**0.0008**
	(0.903)	(0.949)	(0.948)
Size	**0.0008**	**-0.0014**	**-0.0014**
	(0.479)	(0.339)	(0.347)
GDP	**0.0003**	**0.0001**	**0.0001**
	(0.434)	(0.824)	(0.828)
BoardSize	**-0.0002**	**-0.0003**	**-0.0003**
	(0.641)	(0.509)	(0.499)
Bachelor	**0.0001**	**-0.0001**	**-0.0001**
	(0.835)	(0.880)	(0.868)
Master	**-0.0003**	**-0.0004**	**-0.0004**
	(0.548)	(0.449)	(0.435)
PhD	**0.0002**	**-0.0002**	**-0.0002**
	(0.812)	(0.829)	(0.840)
R-squared	0.354	0.288	0.289
*Notes: p-values in parentheses; *,*			

, * *indicate significance*			

Source: Author's calculation

To select the most appropriate method for analyzing Return on Assets (ROA), a Hausman test was performed. The test resulted in a Chi-Squared statistic of 9.61 and a p-value of 0.475. As this p-value is not statistically significant, it indicates that the Random Effects (RE) model is the more suitable and efficient choice compared to the Fixed Effects model. Therefore, based on the results from the preferred Random Effects model, it was concluded that the Loan-to-Deposit Ratio (LDR) is the only variable with a statistically significant positive effect on ROA after controlling for other factors.

Table 4.3.2. presents the regression analysis results for factors influencing a bank's Return on Equity (ROE). The findings clearly show two variables with a strong, statistically significant impact:

Loan-to-Deposit Ratio (LDR): This variable has a significant positive effect on ROE across all models (coefficient ≈ 0.16, p=0.001). This suggests that as banks lend out a larger portion of their deposits, their return on equity tends to increase.

Debt-to-Asset Ratio (DAR): This variable shows a significant negative relationship with ROE (coefficient ≈ −0.46 to −0.51, p≤0.001). This indicates that higher leverage is associated with lower returns for shareholders.

In contrast, the ESG variable shows no statistically significant effect on ROE. Similarly, none of the other financial ratios (CDR) or control variables, such as Size, GDP, and board member education levels, were found to be significant predictors of ROE in this analysis.

The R-squared values, ranging from 0.320 to 0.370, suggest that the models explain approximately 32% to 37% of the variation in Return on Equity.

Table 4.3.2. Full Model Comparison for ROE

Variable	Pooled OLS	Random Effects	Fixed Effects
ESG	**0.0051**	**0.0039**	**0.0039**
	(0.669)	(0.751)	(0.757)
LDR	**0.1581***	**0.1601***	**0.1598***
	(0.001)	(0.001)	(0.001)

DAR	**-0.5117***	**-0.4571***	**-0.4561***
	(0.000)	(0.001)	(0.001)
CDR	**-0.0898**	**-0.1013**	**-0.1011**
	(0.518)	(0.482)	(0.483)
Size	**0.0071**	**-0.0090**	**-0.0091**
	(0.505)	(0.536)	(0.535)
GDP	**0.0049**	**0.0022**	**0.0022**
	(0.339)	(0.665)	(0.668)
BoardSize	**-0.0041**	**-0.0053**	**-0.0054**
	(0.359)	(0.288)	(0.281)
Bachelor	**0.0028**	**0.0011**	**0.0012**
	(0.575)	(0.852)	(0.840)
Master	**-0.0043**	**-0.0057**	**-0.0058**
	(0.476)	(0.380)	(0.369)
PhD	**0.0002**	**-0.0034**	**-0.0033**
	(0.981)	(0.725)	(0.733)
R-squared	0.370	0.320	0.321

A Hausman test was conducted to determine the appropriate model for analyzing Return on Equity (ROE). The test yielded a Chi-Squared statistic of 9.98 and a p-value of 0.442. Because the p-value is well above the standard significance threshold, the Random Effects (RE) model was confirmed as the most suitable for the analysis. The results from this model are consistent and clear: the Loan-to-Deposit Ratio (LDR) has a significant positive relationship with ROE, while the Debt-to-Asset Ratio (DAR) has a significant negative relationship. None of the control variables or the ESG factor showed a statistically significant impact on ROE.

4.4. Summary of Hypothesis Testing

Based on the regression analysis, only one of the proposed hypotheses was supported by the data (Table 4.4.). Hypothesis H1, which proposed that sustainable development (ESG) positively impacts profitability, was rejected due to a lack of a statistically significant relationship with either ROA or ROE. In contrast, Hypothesis H2a was accepted, as the Loan-to-Deposit Ratio (LDR) demonstrated a significant and positive influence on both measures of profitability. The final two hypotheses were also rejected. Hypothesis H2b was rejected because the Debt-to-Asset Ratio (DAR) either showed no significant impact (on ROA) or had a significant *negative* impact (on ROE), contradicting the proposed positive relationship. Lastly, Hypothesis H2c was rejected as the Capital-to-Deposit Ratio (CDR) was found to have no significant effect on bank profitability.

Table 4.4. Summary Table

Hypothesis	Relationship	Supported by Data?	Verdict
H1	ESG ➞ Profitability (+)	No	**Reject**
H2a	LDR ➞ Profitability (+)	Yes	**Accept**
H2b	DAR ➞ Profitability (+)	No (Impact is negative)	**Reject**
H2c	CDR ➞ Profitability	No	**Reject**

5. Discussion

5.1. Discussion of Findings

The empirical results of this study offer a clear and focused view into the primary drivers of profitability for the surveyed commercial banks. The findings challenge several assumptions about sustainable development and liquidity, pointing towards a financial landscape where traditional credit and leverage management remain the most critical factors.

The most definitive finding is the rejection of the hypothesis that ESG initiatives significantly impact profitability. Contrary to expectations, the analysis found no statistically significant relationship between a bank's ESG standing and its Return on Assets (ROA) or Return on Equity (ROE). This suggests that during the period studied, the costs and benefits of engaging in sustainable practices did not translate into measurable financial gains or losses for the banks. While this doesn't diminish the non-financial importance of sustainability, it indicates that the market may not yet be fully pricing these factors into its valuation of bank performance, or that any financial impact may only materialize over a longer term.

In stark contrast, the study's findings on liquidity and leverage are unambiguous. The Loan-to-Deposit Ratio (LDR) was found to be the most powerful positive driver of both ROA and ROE. This result strongly supports the hypothesis that more active lending is directly correlated with higher profitability. Banks that effectively converted their deposit base into loans generated significantly higher returns. This underscores the fundamental importance of core banking operations—namely, effective credit extension—as the primary engine of profit.

However, this push for lending is moderated by the effect of overall leverage. The Debt-to-Asset Ratio (DAR) was found to have a significant negative impact on Return on Equity. This finding is crucial. While extending more loans (higher LDR) boosts profitability, doing so within a structure of high overall debt (higher DAR) is detrimental to shareholder returns. This highlights a classic risk-reward trade-off: banks that are more highly leveraged face greater financial risk and cost of debt, which ultimately erodes the returns delivered to equity holders.

Finally, the analysis revealed that the Capital-to-Deposit Ratio (CDR) had no significant impact on profitability. This refutes the idea that holding higher cash reserves as a buffer necessarily enhances or detracts from financial performance in a measurable way, at least during the period under review. It appears that the opportunity cost of holding cash and the security it provides effectively cancelled each other out in terms of their effect on the bottom line.

5.2. Recommendations

Based on the empirical findings, the following recommendations are proposed for key stakeholders in the Vietnamese banking sector to enhance profitability and ensure long-term stability.

For Bank Management and Strategists

● Focus on Core Lending and Leverage Management The most significant drivers of profitability are traditional banking activities. The primary focus should be on optimizing the Loan-to-Deposit Ratio (LDR), as this has a direct and strong positive impact on both ROA and ROE. However, this must be balanced with prudent leverage management. The negative impact of the Debt-to-Asset Ratio (DAR) on ROE is a clear warning that while aggressive lending is profitable, excessive overall debt erodes

shareholder value. Therefore, the key strategy is to grow the loan portfolio efficiently while carefully managing the bank's overall leverage.

● Adopt a Strategic View on ESG Investments The analysis found no immediate, statistically significant financial return from ESG initiatives. Therefore, bank leadership should not expect ESG programs to be a short-term driver of profitability. Instead, ESG should be viewed as a long-term strategic investment in brand reputation, risk mitigation, and stakeholder relations. Decisions to invest in sustainability should be framed around these non-financial benefits rather than direct financial gains, ensuring that shareholder expectations are managed appropriately.

● Maintain Prudent, Not Profit-Driving, Liquidity The findings indicate that cash reserves (as measured by CDR) did not significantly impact profitability. This suggests that while maintaining adequate liquidity is essential for operational safety and regulatory compliance, holding excess cash is not a strategy for enhancing profits. Management should focus on maintaining a sufficient liquidity buffer to mitigate risks, rather than viewing it as a strategic, profit-generating asset.

For Policymakers and Regulators

● Develop and Mandate Standardized ESG Reporting To better understand the long-term value of sustainable development, it is crucial to have consistent and comparable data. Regulators should create and enforce a standardized ESG disclosure framework for the banking sector. While the immediate financial link is not yet established, transparent reporting is the first step to enabling the market to accurately price sustainability risks and opportunities in the future.

● Consider Incentives for Sustainable Finance Given the lack of a clear short-term financial incentive for banks to invest in ESG, policymakers should consider creating programs to encourage this behavior if it aligns with national goals. Incentives such as tax benefits for green lending or support for issuing green bonds could help bridge the gap between the upfront costs of sustainability projects and their long-term societal and financial benefits, accelerating the sector's transition.

● Reinforce Capital Adequacy and Leverage Controls The results highlight that high leverage negatively impacts shareholder returns (ROE). Regulators should continue to enforce and strengthen capital adequacy requirements and controls on leverage. This ensures that as banks pursue profitable lending (higher LDR), they do so from a position of financial strength, safeguarding the stability of the entire financial system.

6. Limitations

While this study provides valuable insights, its findings should be interpreted in the context of several key limitations, which also present opportunities for future research.

6.1. Simplification of ESG Data

The most significant limitation is the measurement of sustainable development. Lacking a standardized ESG rating system in Vietnam, this study used a binary dummy variable (1 for reporting, 0 for not). This necessary simplification captures a bank's commitment to disclosure but fails to measure the quality or impact of its sustainability practices. Consequently, the true effect of substantive ESG performance on profitability may be obscured. The finding of no significant ESG impact should be understood as a reflection of reporting status, not necessarily of sustainability performance itself.

6.2. Limited Research Sample

The study's sample was confined to commercial banks listed on Vietnam's stock exchanges, which ensures data transparency but excludes unlisted private, joint-venture, and wholly state-owned banks. These institutions operate under different strategic pressures and governance models. Therefore, the conclusions drawn are most applicable to listed commercial banks and may not be fully generalizable to the entire Vietnamese banking system.

6.3. Atypical Economic Conditions

The research covers a relatively short five-year period (2019–2023) dominated by the unique economic disruptions of the COVID-19 pandemic and its aftermath. This timeframe is likely insufficient to capture the long-term returns from sustainability investments. Furthermore, the strong observed relationships, particularly the positive impact of the Loan-to-Deposit Ratio (LDR) and the negative impact of the Debt-to-Asset Ratio (DAR), might be heightened by these specific crisis-and-recovery conditions. The market's emphasis on core lending and the risks of leverage could be characteristic of this volatile period and may differ in a more stable economic cycle.

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