

The impact of feminism on bank performance: the case of Vietnam

Yen Thi Nguyen, Cuong Thanh Dang and Hang Thi Trinh
*Faculty of Finance and Banking, College of Economics,
Vinh University, Vinh City, Vietnam*

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Abstract

Purpose – This study aims to evaluate the impact of board characteristics on bank performance at the commercial bank in Vietnam.

Design/methodology/approach – By running the pool OLS, fixed-effect and random-effect models with a panel data set of 294 observations from 2008 to 2021, the authors have examined determinants of bank performance.

Findings – The research results show that bank size, governance efficiency, capital adequacy ratio and economic growth have a positive effect while credit risk has a negative relationship with the commercial bank's performance.

Originality/value – In particular, the result shows the relationship between chief executive officers' (CEOs) gender and bank performance. Commercial banks led by female CEOs have lower bank performance than that led by male CEOs. However, this impact magnitude is not significant. The research results are the basis to propose recommendations to improve the Vietnamese commercial bank's performance.

Keywords Board of directors, CEO and management, Corporate governance, Financial institutions

Paper type Research paper

1. Introduction

Good business performance is both a driving force for development and a condition for the survival of any commercial bank. It affirms the business efficiency and reputation of commercial banks. The banks with high profits will enhance competitive strength, create resources to improve and enhance the quality of banking products and services and innovate technology to do business more efficiently. Moreover, profit from operational efficiency is one of the core resources to improve the risk management capacity of commercial banks. Not only that, it plays a core role in the development of the financial system, which impacts not only socioeconomic but also environmental sustainability (Xu *et al.*, 2022). With such an urgent meaning, improving business performance is the goal of any commercial bank. Hence, it is extremely essential to examine the factors affecting the business results of commercial banks.

Modern corporate governance encourages the participation of women in key positions in the enterprise. Many countries have enacted gender quota laws for corporate boards that stipulate a minimum percentage of female participation in leadership positions. Spain, France and Italy have set a gender quota for the company's Board of Directors of 40%. The figures in Belgium, Portugal and Australia are 33% and 30% in The Netherlands, Germany, Austria and 25% in Greece (Kirsch, 2021). The increase in gender quotas in developed



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countries shows the indispensable role of women in leadership positions. Advances in gender equality contribute to narrowing the gap in qualifications and capacity; create opportunities for women to participate in leadership positions, raise their voices and make positive contributions to society. Gender diversity in leadership will contribute to diverse perspectives and views on different issues when making decisions. Therefore, policy-making and decision-making will be more comprehensive and suitable, especially for policies affecting women. On the other hand, women have valuable qualities suitable for running businesses in general and commercial banks in particular, such as risk-taking, dedication and hard work and especially the ability to inspire and interact with customers, subordinates and stakeholders.

With an increasingly progressive society, women play an increasingly important role in any country's development in all fields, including Vietnam. According to the latest research by Grant Thornton International, up to 2021, Vietnamese women will account for more than 50% of the workforce, and the percentage of female leaders will account for 39%, higher than the global average of 31% (Ngo Thi Kim Van, 2021). Vietnam is standing between tradition and modernity. The role of women cannot be undeniable. However, there are still debates about the role of women in management, especially in improving business performance. Vietnamese women have invaluable qualities suitable for leaders, especially creativity, understanding, adaptability, decisiveness and extraordinary efforts when faced with difficulties.

Contrary to this view, some argue that Vietnamese women face many barriers in management. In addition to bearing a significant burden of family care, Vietnamese women often lack opportunities to expand social relationships and suffer from social prejudices when failing. Moreover, women have to repeatedly prove their ability to gain rank. These difficulties are likely to affect the management effectiveness of women-led enterprises, especially in a high-pressure industry such as the banking industry.

Literature review shows that very few studies examine the relationship between chief executive officer (CEO) gender and the business performance of commercial banks. Based on this research gap, the paper builds a model to test factors impacting the Vietnamese commercial banks' business performance. In particular, one of the study's highlights is to provide evidence on the relationship between CEOs' gender and the business performance of commercial banks. The authors have used a data set of Vietnamese commercial banks from 2008 to 2021. The data includes 294 observations from 32 commercial banks, accounting for about 80% of the data set of the Vietnamese banking system. The research demonstrates that female leaders have lower business performance than men in the Vietnamese banking industry, but the difference is trivial. Although Vietnamese women are extremely brave and capable of recognizing risks and maintaining relationships more than men, they are under too much pressure to take care of their families and social prejudices. Most people think that women are not suitable for senior leadership because it is difficult for them to balance work and family. In addition, they consistently overestimate men's ability in management and STEM careers (Science – Technology – Engineering – Mathematics), which causes disadvantages in women's promotion. The research results are the basis for proposing solutions to enhance business efficiency at commercial banks. In addition, it shows the influence of gender on business performance. From there, research shows the need to dismantle social stereotypes about women to further open their promotion opportunities because gender diversity is vital to creating novelties and differences.

The remainder of this paper consists of four sections. Section 2 reviews research related to the impact of board characteristics on bank performance. Section 3 proposes the methodology to build models to address alternative hypotheses. Section 4 presents the

research results and discussions. Finally, Section 5 proposes some recommendations to enhance business performance of Vietnamese commercial banks, in particular, and the Vietnamese financial system, in general.

2. Literature review

Agency theory was proposed by [Ross \(1973\)](#) and developed by [Jensen and Meckling \(1976\)](#) to explain the economic relationship with heterogeneous goals between business owners (shareholders) and management representatives (executive director and authorized person). Each subject is individualistic and opportunistic. They always put their interests first and maximize their interests. While shareholders want the business to operate quickly and efficiently and maximize the benefits of the business, the management representatives carry out the management work at their own pace, avoiding risks and seeking personal interests among the company's interests. It leads to incompatibility in the goals of shareholders and executive directors. The separation between ownership and management rights causes conflicts. The management representative who manages other people's capital will not be as careful as managing their capital ([Jensen and Meckling, 1976](#)) while they are responsible for strategic decisions and have a powerful impact on the business performance of any business ([Hambrick and Mason, 1984](#); [Carpenter et al., 2004](#)). Therefore, a good CEO not only need skills and work experience but also does not engage in personal goals exerting to the detriment of shareholders ([Carter et al., 2003](#); [Valls and Rambaud, 2019](#)). It is necessary to emphasize the role of owner and management representatives to enhance the company's performance ([Jensen and Meckling, 1976](#)).

The upper echelon theory introduced by [Hambrick and Mason \(1984\)](#) has proven its reliability in considering the role of the CEO in solving business problems ([Carpenter et al., 2004](#)). Each of these executives tackles issues through a highly-personalized lens. The difference in personalization perspective arises due to differences in experience, qualifications, personality and other factors. Therefore, the CEO's characteristic strongly impacts the company's performance ([Hambrick and Mason, 1984](#)). To understand a strategy, it is essential to understand the person who makes it ([Finkelstein et al., 2009](#)). In particular, gender characteristics play a fundamental role in creating the CEO's personality and influencing decisions related to business issues. Therefore, CEO gender is one of the demographic characteristics that can strongly influence the business results of any business, especially in a high-risk industry such as the banking industry ([Huang and Kisgen, 2013](#)).

The role of women on the board of directors is studied in recent years. When looking at financial intermediaries in the USA from 2007 to 2015, [Geyfman et al. \(2018\)](#) suggested that gender diversity (as measured by the percentage of women on the board of directors) contributed significantly to improving operating results without increasing the risk for the bank. This research result is similar to [Lafuente and Vaillant \(2019\)](#) when studying financial companies in the Costa Rican industry from 2000 to 2012 and [Stefanovic and Barjaktarovic \(2021\)](#) when examining commercial banks in Serbia. Bank performance is affected by different aspects of gender diversity in management. [Lafuente and Vaillant \(2019\)](#) and [Stefanovic and Barjaktarovic \(2021\)](#) demonstrated that a balanced sex rate brings outstanding economic efficiency.

However, the impact of CEO gender on the bank's business results is still controversial. When researching credit institutions in Luxembourg from 1999 to 2013, [Reinert et al. \(2016\)](#) demonstrated a positive relationship between female CEOs and business performance. A 10% increase in the percentage of women in management positions will increase the bank's ROE by 3%. This influence is even more robust during the global financial crisis. It

highlights the role of women that play a vital role in overcoming difficulties in the crisis period. This view is consistent with [Ting \(2021\)](#) when studying the impact of CEO gender on the performance of commercial banks in China. Through the least squares regression model, [Ting \(2021\)](#) proves that the power and performance of female CEOs are not inferior to male CEOs. In particular, the business results of female CEOs are even better than when the banks are not state-owned enterprises or their largest owners are not the government. Based on the point of view of [Reinert et al. \(2016\)](#) and [Ting \(2021\)](#), *H1* is proposed as follows:

H1. The female-led banks positively impact the performance of commercial banks.

In contrast, [Endraswati \(2018\)](#), [Handa \(2019\)](#), [Lafuente and Vaillant \(2019\)](#), [Gupta and Mahakud \(2020\)](#) and [Pham \(2023\)](#) showed that female CEOs have a strong negative impact on bank performance. When researching the characteristics of the CEO affecting bank performance in Indonesia and India, [Endraswati \(2018\)](#) and [Handa \(2019\)](#) suggested that commercial banks under female CEOs have lower business performance than commercial banks run by male CEO. According to [Lafuente and Vaillant \(2019\)](#) and [Okoyeuzu et al. \(2021\)](#), gender diversity is essential in improving a commercial bank's business performance. However, this result is only meaningful when there is no participation of women in senior executive positions such as Chairman of the Board of Directors or Chief Executive Officer. In addition to the CEO's expertise and experience positively impacting bank performance, [Gupta and Mahakud \(2020\)](#) demonstrated that commercial banks run by male CEOs often have better business performance than commercial banks run by female CEOs. When researching Pakistani commercial banks from 2005 to 2016, [Chandani et al. \(2018\)](#) found that the participation of women in senior leadership did not significantly affect the commercial bank's financial performance. Based on [Endraswati \(2018\)](#), [Chandani et al. \(2018\)](#), [Handa \(2019\)](#), [Lafuente and Vaillant \(2019\)](#), [Gupta and Mahakud \(2020\)](#) and [Pham \(2023\)](#), *H2* is proposed as follows:

H2. The male-led banks positively impact the performance of commercial banks.

Other variables were considered comprehensively. According to [Jara-Bertin et al. \(2014\)](#), the bank size is positively related to bank performance because commercial banks operate on trust. Large commercial banks have many advantages in terms of mobilizing capital from customers, lending in the interbank market or receiving support from the central bank. With the advantage of low capital mobilization costs, large commercial banks often boldly invest in risky projects capable of generating high profits. In contrast, when researching commercial banks in the Asia Pacific, [Yang et al. \(2019\)](#) showed that economies of scale tend to be lower for large commercial banks due to rapid expansion. It makes profit gradually decreased according to the size of commercial banks during the research period. In this study, the authors expect a positive relationship between the size and performance of commercial banks.

Many studies have given conflicting views on the impact of the capital adequacy ratio (CAR). According to [Jara-Bertin et al. \(2014\)](#) and [Yang et al. \(2019\)](#), the CAR has a positive relationship with bank performance. Holding a reasonable amount of capital is expected to act as a buffer in times of crisis. An appropriate level of capital is a source of liquidity that helps improve operational efficiency by reducing financing costs. [Afzal et al. \(2021\)](#) emphasized that the CAR indicates the commercial bank's soundness, which leads to the limitation of the customer's transfer deposit to another bank and enhances stability in the number of deposits. On the contrary, [Abdul Hadi et al. \(2018\)](#) and [Aspal et al. \(2019\)](#) assert that an increase in CAR will cause an adverse impact on the long-term profitability of

commercial banks because too much capital encourages acceptance of low risk, which is likely to affect earnings potential. Moreover, higher capital reduces the debt position of companies, leading to commercial banks not taking advantage of the “tax shield”. Therefore, the CAR has the ability to reduce or improve the performance of commercial banks. According to [Abdul Hadi et al. \(2018\)](#) and [Aspal et al. \(2019\)](#), the authors expect a negative correlation between the CAR and bank performance.

Credit is one of the core activities of any commercial bank. Previous studies examine the impact of credit growth and credit risk on bank performance. Strong credit growth often creates expectations of a breakthrough in profit. [Abdul Hadi et al. \(2018\)](#) demonstrate a positive correlation between credit growth and business performance. In this study, the positive relationship between credit growth and bank performance is expected. According to [Jara-Bertin et al. \(2014\)](#) and [Abdul Hadi et al. \(2018\)](#), credit risk negatively impacts the business performance of commercial banks. Increased credit risk causes commercial banks to raise provisions for risks, reducing the profit. In this study, a negative relationship between credit risk and bank performance is expected.

[Aspal et al. \(2019\)](#) show that governance efficiency harms the performance of commercial banks. The high governance efficiency helps commercial banks reduce costs and increase profits. Therefore, the authors expect a positive correlation between governance efficiency and bank performance.

The bank’s ownership structure plays an essential role in affecting the business results of commercial banks. Because state-owned commercial banks can quickly access information, which helps them respond more quickly to regulatory policy changes than private commercial banks. However, some theories believe that state-owned commercial banks must comply with stricter management requirements. Therefore, they often engage in less risky activities than other commercial banks ([Samet et al., 2018](#)). According to these arguments and applications in Vietnam, the authors believe that the performance of state-owned commercial banks is lower than that of other commercial banks.

Several studies have examined the impact of external factors on bank performance. Economic growth boosts the development of commercial banks. Economic development opens up more room for commercial banks in credit growth, improves cash flow and circulation and minimizes credit risks. According to [Jara-Bertin et al. \(2014\)](#), the authors expect a positive correlation between bank performance and economic growth.

[Jara-Bertin et al. \(2014\)](#) and [Yang et al. \(2019\)](#) showed that inflation contributes to the increase of commercial banks’ operational efficiency because the growth rate of interest income is faster than interest expense. Based on [Jara-Bertin et al. \(2014\)](#) and [Yang et al. \(2019\)](#), the authors expect this relationship to be positively correlated.

The higher the long-term lending interest rate (LIR), the higher the profit because the interest income of commercial banks increases faster than the interest expense ([Tran et al., 2020](#)). Therefore, the authors expect a positive correlation between bank performance and long-term lending rates.

3. Research methodology

3.1 Empirical model

To examine the link between CEO’s gender and bank performance, we estimate the equation as follows:

$$\text{PER}_{it} = \beta_0 + \beta_1 \text{SIZE}_{it} + \beta_2 \text{CAR}_{it} + \beta_3 \text{NPL}_{it} + \beta_4 \text{EFF}_{it} + \beta_5 \text{GROWTH}_{it} \\ + \beta_6 \text{OWN}_{it} + \beta_7 \text{CEO}_{it} + \beta_8 \text{GDP}_{it} + \beta_9 \text{INF}_{it} + \beta_{10} \text{LIR}_{it} + \varepsilon_{it}$$

where:

- PER_{it} = independent variable indicating bank performance for bank i on year t;
 SIZE_{it} = size for bank i at the time t;
 CAR_{it} = capital adequacy ratio for bank i at the time t;
 NPL_{it} = credit risk for bank i at the time t;
 EFF_{it} = management efficiency for bank i at the time t;
 GRO_{it} = credit growth for bank i at the time t;
 OWN_{it} = ownership structure for bank i at the time t;
 CEO_{it} = gender of the CEO for bank i at the time t;
 GDP_{it} = gross domestic product of Vietnam on the year t;
 INF_{it} = overall inflation rate in Vietnam on the year t;
 LIR_{it} = long-term lending interest rate on the year t; and
 ε_{it} = random error term.

3.1.1 The dependent variable. Previous studies often used a few indexes to measure the enterprise's business performance. However, return on total assets (ROA) and return on total equity (ROE) are the two most commonly used ratios, which are considered fundamental indicators to evaluate the strength of financial institutions (Earle and Mendelson, 1991). Chandani *et al.* (2018), Handa (2019), Gupta and Mahakud (2020), Ting (2021) and Stefanovic and Barjaktarovic (2021) used ROA and ROE to measure the corporate's operational performance. In addition, some metrics are used as net interest margin (NIM) ratio calculated as net interest income/total assets; non-performing loan ratio (NPL) used by Lafuente and Vaillant (2019) and Gupta and Mahakud (2020). In addition, Gupta and Mahakud (2020) and Ting (2021) also used profit before provisioning. Two metrics (equity-to-assets and net income) are used by Stefanovic and Barjaktarovic (2021) to measure performance.

According to Chandani *et al.* (2018), Handa (2019), Lafuente and Vaillant (2019), Gupta and Mahakud (2020), Ting (2021) and Stefanovic and Barjaktarovic (2021), ROA and NIM are chosen to measure the commercial bank's business performance.

ROA is a measure of profitability per dollar of assets. In other words, ROA reflects how assets are used to generate profits and is calculated according to the formula: $ROA = \frac{\text{Net profit}}{\text{Total asset}}$. It is the most appropriate performance measure, demonstrating the ability of commercial banks to manage assets to make profits (Athanasoglou *et al.*, 2008). Many studies used ROE. However, ROE is not appropriate for long-term studies, as equity can vary over time between banks with similar performance.

NIM measures the difference between interest income and interest expenses that the commercial bank gain by controlling profitable assets. NIM is a good measure of financial intermediation costs (Brock and Rojas-Suarez, 2000) because NIM can explain the commercial bank's performance and the competitive nature of the banking industry. NIM is calculated as follows: $NIM = \frac{\text{Interest income} - \text{Interest expenses}}{\text{Total asset}}$ (Kasman *et al.*, 2010).

The higher the ROA and NIM, the higher the level of assets used to generate profits and NIM, which shows that the business performance of commercial banks is better.

3.1.2 The independent variables. Based on the research overview, the model consisting of 10 independent variables is proposed. In there, there are seven interbank factors and three macroeconomic indicators. In addition to the variables used in the previous study, the authors propose a new variable (CEO gender) to test the impact of CEO gender on the

Vietnamese commercial bank's performance. The description of the variables is shown in the [Appendix – Table A1](#).

3.1.2.1 Bank-specific factors. *Size of bank (SIZE)*: Based on [Jara-Bertin et al. \(2014\)](#) and [Yang et al. \(2019\)](#), bank size (SIZE) is measured by the logarithm of total assets. The higher this indicator, the larger the commercial bank's size.

Capital adequacy ratio (CAR): The CAR is calculated by the following formula:

$$CAR (\%) = \frac{\text{Tier 1 capital} + \text{Tier 2 capital}}{\text{Total Assets At Risk}} * 100.$$

Credit risk (NPL): NPL ratio is used for the commercial bank's credit risk. The higher the NPL ratio, the lower the asset quality of the commercial bank and the greater the credit risks that commercial banks face.

Governance efficiency (EFF) is calculated as total operating costs/total assets ([Maudos and Fernandez de Guevara, 2004](#); [Maudos and Solis, 2009](#)). The higher the EFF, the lower the commercial bank's governance efficiency.

Credit growth (GRO): According to [Abdul Hadi et al. \(2018\)](#), credit growth is calculated as follows: $CREDIT (\%) = \left(\frac{\text{Debit balance in this period}}{\text{Debit balance in the previous period}} - 1 \right) * 100$. The higher the CREDIT, the faster the commercial bank's credit growth.

Ownership structure (OWN): Dummy variable is used to represent the ownership structure, equal to 1 if commercial banks are more than 50% state-owned and 0 otherwise.

CEO gender: Dummy variable is used, equal to 1 if the commercial bank is run by a female CEO and 0 if the commercial bank is run by a male CEO.

3.1.2.2 Macroeconomic factors. To examine the impact of macro variables on commercial banks' activities, the authors consider the impact of economic growth (gross domestic product [GDP]), inflation (INF) and long-term LIR on bank performance. Data are taken from IMF sources, ensuring reliability and accuracy.

Economic growth (GDP): GDP is an indicator of the health of a country's economy. The larger this index, the stronger the economic growth.

Inflation (INF): The inflation rate is calculated based on the consumer price index CPI at the end of the quarter this year and the same quarter last year in Vietnam (%). The larger the index, the higher the level of inflation.

Long-term LIR: It is the interest rate of loans in terms of 60 months or more.

3.2 Data

The study is based on secondary data extracted from the annual audited financial statements of Vietnamese commercial banks and macro data from the IMF in a 13-year research period (from 2008 to 2021). Therefore, research data ensures reliability and accuracy. After data collection, 294 observations of 32 banks are chosen, which is the number of suitable samples needed for the regression model. Several banks were excluded for lack of data. The data set in the study accounts for about 80% of the data on the Vietnamese banking system. The collected data is calculated according to the formula shown in [Appendix – Table A1](#). The authors used the STATA programme to run Pool OLS, fixed-effect and random-effect to choose the most suitable model to test determinants of bank performance. Besides, to test the regression model and its defects, the authors have used the Eview programme.

4. Results

4.1 Descriptive statistics

Research data is described in [Table 1](#), classified by commercial banks run by male CEOs and female CEOs. As can be seen, most Vietnamese commercial banks are mainly operated

Variables	Obs.	Maximum	Minimum	Mean	SD
<i>Male CEO</i>					
ROA	254	0.061835	0.0000135	0.010294	0.007458
NIM	254	0.081310	0.000000	0.027351	0.011587
SIZE	254	35.10505	29.64305	32.66365	1.159302
CAR	254	0.481400	0.077000	0.131791	0.050409
NPL	254	0.090427	0.000183	0.020884	0.012631
EFF	254	0.032893	0.000000	0.016482	0.005263
GRO	254	1.220292	-2.33341	0.238321	0.210500
STA	254	1.000000	0.000000	0.122047	0.327987
GDP	254	36.37192	24.75933	35.92194	0.399034
INF	254	2.730000	0.006300	0.259918	0.705506
LIR	254	16.95000	6.960000	9.533071	3.113965
<i>Female CEO</i>					
ROA	40	0.055663	0.000019	0.008274	0.009285
NIM	40	0.065080	0.007661	0.024673	0.012192
SIZE	40	33.88700	30.04741	31.77477	1.073629
CAR	40	0.240500	0.079800	0.132200	0.044485
NPL	40	0.124635	0.006337	0.024357	0.020866
EFF	40	0.025919	0.005825	0.015794	0.004925
GRO	40	0.511922	-0.042468	0.155541	0.129622
STA	40	1.000000	0.000000	0.082430	0.121256
GDP	40	36.37912	34.75933	35.94227	0.043184
INF	40	2.730000	0.006300	0.391859	0.896087
LIR	40	16.95000	6.960000	9.464750	3.1176852

Table 1.
Descriptive statistics
for female and male
CEOs

Source: Table by authors

by male CEOs (accounting for 86% of research data). The variables ROA, NIM, SIZE, CAR and EFF of commercial banks led by male CEOs have average and maximum values higher than these indicators at commercial banks led by female CEOs. Contrary, the NPL of commercial banks led by female CEOs is 0.024357, higher than this index at commercial banks led by male CEOs (0.020884). SIZE and LIR have a high standard deviation, reaching 1.159302 and 3.113965, while the remaining variables have a low standard deviation. This shows that the SIZE and LIR variables have data sets with a large degree of variability.

The correlation coefficients between the variables are presented in Table 2. Most of the pairs of variables have low correlation coefficients. However, the pairs of variables (GDP, INF) (NIM, EFF) and (ROA, NIM) have high correlation coefficients of -0.7649 , -0.7419 and 0.5197 , respectively. This shows that multicollinearity may be a problem with the regression model. We run the regression model and test its diagnostics in the next tables.

4.2 The impact of chief executive officer gender on bank performance

To test the impact of CEO gender on bank performance, the study runs a regression model with ten independent variables and two dependent variables (ROA and NIM) corresponding to two regression models. For each model, the authors regress Pool OLS, fixed-effect and random-effect. Based on the *F*-test and Hausman test, the most suitable regression model has been chosen.

The *F*-test and Hausman test results show that Pro (*F*-statistic) = 0.0000. In other words, the residuals and the independent variable are not correlated. Therefore, the fixed-effect model is the best model to explain the impact of factors on the commercial bank's

Table 2.
Correlation between
the main variables

Variables	ROA	NIM	SIZE	CAR	NPL	EFF	GRO	STA	CEO	GDP	INF	LIR
ROA	1.0000											
NIM	0.5197	1.0000										
SIZE	0.0128	0.0610	1.0000									
CAR	0.0811	0.1557	-0.5043	1.0000								
NPL	-0.2140	-0.0265	-0.1402	0.1235	1.0000							
EFF	-0.2167	-0.7419	-0.1231	0.2595	0.1445	1.0000						
GRO	0.1678	-0.1147	-0.1769	0.0948	-0.0821	-0.1858	1.0000					
STA	-0.0595	-0.0318	0.5010	-0.2199	0.0306	-0.1372	-0.1009	1.0000				
CEO	-0.0896	-0.0787	-0.2573	0.0028	0.0849	-0.0453	-0.1398	-0.1362	1.0000			
GDP	-0.0587	0.1102	0.4072	-0.2219	-0.1681	0.1488	-0.3216	0.0104	0.0292	1.0000		
INF	0.0612	0.0649	0.0824	-0.1010	-0.0575	0.0836	-0.0637	-0.0201	0.0617	0.2881	1.0000	
LIR	0.1537	0.0239	-0.3008	0.1875	0.1751	-0.0859	0.0569	0.0030	-0.0075	-0.7649	-0.1108	1.0000

Source: Table by authors

performance. Two fixed-effect models (Model II and V) with Prob (F -statistic) = 0.00000 < 0.01 show that the model has statistical significance at 99%. Approximately 19% and 59.72% of the variation in ROA and NIM were explained by the independent variables, respectively. For Model II with the dependent variable ROA, the CEO variable negatively correlated with the dependent variable at a 10% significance level. Model V with the dependent variable NIM, CEO variable positively affects the dependent variable at a 5% significance level. ROA and NIM are both positively correlated with bank performance. Therefore, the female gender of the CEO exerts negatively the bank's performance (Table 3).

Akaike Information Standard (AIC) and Schwarz Information Standard (SC) are used to choose the most suitable model. The smaller the AIC and SC values, the stronger the model (Mohammed *et al.*, 2015). So, Model V is stronger than Model II. Therefore, Model V is the best model to explain the impact of factors on the business performance of commercial banks.

Test for omitting variables: We can see that the variables GRO, OWN và INF are not statistically significant. We use the Wald test to examine whether to eliminate or not, and we have a P -value of F -statistic = 0.4589 > 0.05; therefore, we can eliminate these variables but not affect the result of the model.

Test for multicollinearity: We use variance inflation factors (VIF) to test for multicollinearity. The results show that the VIFs of the dependent variables SIZE, CAR, NPL, EFF and CEO are lower than 2. The VIFs of the dependent variables GDP and LIR is 2.561 and 2.204, respectively, higher than 2, which means that multicollinearity is one of the model's problem. The authors overcome the multicollinearity defect by removing LIR. Research results show that all variables have VIF coefficients less than 2 (Table 4) and the mean VIF is 1.356, which implies that multicollinearity is not an issue of this model.

Test for autocorrelation: We use Durbin–Watson to test autocorrelation. Durbin–Watson statistic of the model is 1.77355, which is within a range from 1 to 3. Therefore, autocorrelation is not a problem with this model.

Test for heteroskedasticity: The White test is used to test the heteroskedasticity error in the fixed-effect model. The result shows that Prob > Chi2 = 0.5435, which is higher than 0.05 (Appendix – Table A3). Therefore, the model has not heteroskedasticity problem.

After overcoming the defects, the model that best represents the impact of factors on bank performance is presented in Table 4.

The model results show that Pro (F -statistic) = 0.00000 < 0.05. In other words, the model is statistically significant. R-squared = 0.791218 shows that the model explains 79.12% of the change of the dependent variable. Moreover, five variables affect the business performance of Vietnamese commercial banks as follows:

- With 99% confidence, SIZE and GDP positively impact the dependent variable positively correlated with bank performance. When SIZE and GDP increase (decrease) by 1 unit, NIM rises (falls) by 0.009507 and 0.00532 units, respectively. These variables covariate with bank size and economic growth. Therefore, the higher bank's size and economic growth, the higher the bank's performance. These results are consistent with the authors' expectations and Jara-Bertin *et al.* (2014).
- With 99% confidence, EFF impacts negatively on the dependent variable positively correlated with bank performance. When EFF goes up (drops) by 1 unit, NIM goes down (grows) by 1.599578 units. However, EFF is inversely related to governance efficiency. Therefore, the higher the management efficiency, the better the bank's

Table 3.
Result of the regression model testing the impact of CEO gender on the overall bank performance

Variables	ROA		Random-effect		NIM		Random-effect	
	Pool OLS (Model I)	Fixed-effect (Model II)	(Model III)	Pool OLS (Model IV)	Fixed-effect (Model V)	(Model VI)	Random-effect (Model VI)	
Constant	-0.02303	0.11333*	0.00089	-0.1538**	0.02355**	-0.09913		
SIZE	0.00132**	0.00727***	0.00239***	0.0023***	0.0105***	0.0052***		
CAR	0.00753	0.00180	-0.00045	0.01030	0.01746*	0.01199		
NPL	-0.1458***	-0.0778**	-0.1105***	-0.1212***	-0.079***	-0.101***		
EFF	-0.47413***	-0.27788***	-0.29804***	-1.7997***	-1.6721***	-1.6233***		
GRO	0.00799***	0.00636***	0.00679***	0.00416*	0.00265	0.00266		
OWN	-0.00186	0.00029	-0.00372	-0.00053	0.00033	-0.00380		
Female CEO	-0.00039	-0.00014*	-0.00070*	-0.00136*	-0.0003**	-0.00125*		
GDP	-0.00064	0.00972***	-0.00218	0.0019	0.0105***	-0.00211		
INF	0.00057	0.00075	0.00635	-0.00023	-0.00005	-0.00016		
LIR	0.00062***	0.00048**	0.00057***	0.0008***	0.0007***	0.0008***		
Prob (<i>F</i> -statistic)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000		
<i>R</i> -squared	0.2159	0.1900	0.2403	0.6211	0.5972	0.5666		
Durbin-Watson Sta.	1.07769	1.40122	1.24711	1.47811	1.77355	1.66258		
<i>F</i> -test		0.0000			0.0000			
Hausman test			0.0000			0.0000		
Alakke information standard (AIC)		8.238530				7.395916		
Schwarz information standard (SC)		7.787479				6.944866		
No. of obs.	294	294	294	294	294	294	294	

Note: Statistically significant at *10, **5 and ***1%

Source: Table by authors

performance. The research results are consistent with the authors' expectations and [Aspal et al. \(2019\)](#).

- With 95% confidence, CAR positively correlated with the dependent variable positively correlated with bank performance. When CAR grows (declines) by 1 unit, NIM raises (drops) by 0.018286 units. CAR covariates with the CAR. Therefore, the higher the CAR, the better the bank's performance. The results of this study are contrary to the authors' expectations, [Abdul Hadi et al. \(2018\)](#) and [Aspal et al. \(2019\)](#). However, the research results are consistent with the Vietnamese commercial bank's practice.
- With 99% confidence, NPL exerts the dependent variable positively correlated with bank performance. When NPL get a raise (reduce) by 1 unit, NIM drops (raises) by 0.094753 units. NPL positively correlated with credit risk, so the higher the credit risk, the lower bank's performance. The research results are consistent with the authors' expectations, [Jara-Bertin et al. \(2014\)](#) and [Abdul Hadi et al. \(2018\)](#).
- Significantly, at the 5% significance level, female CEO harms the dependent variable positively correlated with bank performance. Therefore, commercial banks led by female CEOs have lower business results than male CEOs, but not significant, only about 0.00621. This result is consistent with the authors' hypothesis, in contrast to the previous study by [Reinert et al. \(2016\)](#) and [Ting \(2021\)](#) ([Table 5](#)).

Variables	Coefficient	VIF
C	-0.305283***	
The size for bank (SIZE)	0.009507***	1.735
Capital adequacy ratio (CAR)	0.018286**	1.450
Credit risk (NPL)	-0.094753***	1.076
Governance efficiency (EFF)	-1.599578***	1.171
The gender of CEO (Female CEO)	-0.000621**	1.143
The economic growth (GDP)	0.00532***	1.561
Prob (F-statistic)	0.000000	VIF mean = 1.356
R-squared	0.791218	
No. of obs.	294	

Table 4.
Result of the
regression model
testing the impact of
CEO gender on the
overall bank
performance

Note: Statistically significant at **5 and ***1%

Source: Table by authors

No.	Acronym	The name of variables	Expectation (with bank performance)	The test result
1	SIZE	The size for bank	+	+
2	CAR	Capital adequacy ratio	-	+
3	NPL	Credit risk	-	-
4	EFF	Management efficiency	+	+
5	CEO	Female CEO	+/-	-
6	GDP	The economic growth	+	+

Notes: + Positive; - Negative

Source: Table by authors

Table 5.
Determinants of the
Vietnamese
commercial bank's
performance

5. Conclusions

The study examined the hypotheses related to the impact of CEO gender on the Vietnamese commercial bank's performance. The study examined determinants of bank performance, especially testing the hypotheses related to the impact of CEO gender on the Vietnamese commercial bank's performance. The result suggests that governance efficiency, bank size and the CAR promote bank performance. Moreover, during the period of economic growth, the bank's operational efficiency improved significantly. By contrast, the commercial bank facing high credit risk exerts bank performance. The highlight of the study is to demonstrate the impact of CEO gender on banking performance. The Vietnamese commercial banks led by female CEOs have lower business results than that led by male CEOs, but not considerable. It is in contrast to [Reinert et al. \(2016\)](#) and [Ting \(2021\)](#). However, the research results are completely consistent when considering the practice in Vietnam. Specifically, as follows:

Firstly, the higher the commercial bank's governance efficiency, the better the bank's performance. Governance efficiency is the most influential factor, playing a decisive role in the business results of Vietnamese commercial banks. The more effective commercial banks' governance, the lower cost is and the higher profits the commercial bank gain. However, the Vietnamese commercial bank's organizational model still has many unreasonable problems that make management inefficient. Internal management activities at commercial banks still face many difficulties as not building a good business culture and supporting information systems, connecting with stakeholders, etc.

Bank size positively affects the commercial bank's performance. In a volatile world, customers increasingly realize the potential risks in the business of commercial banks. They put their faith in large commercial banks and believe that the larger the bank's scale, the less likely it is to fail (too big to fail). Therefore, Vietnamese large-scale commercial banks have advantages in mobilizing capital. With low-cost and abundant finances, they often boldly invest in projects with high profitability, which promotes bank performance.

Thirdly, the CAR positively affects Vietnamese commercial banks' performance. As a measure of the amount of capital to support the risky assets of commercial banks, the higher the CAR, the greater the risk tolerance of commercial banks. It helps improve the reputation of commercial banks, creating favourable conditions in capital mobilization, credit growth and other business activities. Vietnamese commercial banks have been aiming to apply Basel II standards to limit the bank's business risks. Most of the capitalization of Vietnamese commercial banks has been improving significantly due to profitability and the application of Basel standards. However, compared with commercial banks of other countries in the region, the CAR of Vietnamese commercial banks is still thin. The CAR at Vietnamese commercial banks is around 11.3% compared to 16% to 24% in ASEAN-5 countries in 2021 (Indonesia, Malaysia, Philippines, Singapore and Thailand). The fast credit growth rate may cause the CAR ratio to decrease in a short time if commercial banks do not have an appropriate roadmap and plan to increase capital.

Research results show that the higher the credit risk, the lower the bank's performance. The increase in credit risk causes Vietnamese commercial banks to make provision for it, which reduces the commercial bank's profitability. With the strong impact of the COVID-19 pandemic in the past two years, credit risks at Vietnamese commercial banks are gradually increasing. According to the State Bank's announcement, by the end of December 2021, the system's on-balance-sheet bad debt ratio was at 1.9%, up from 1.69% at the end of 2020. The internal bad debt ratio was 1.9%. The unresolved debt sold to Vietnam asset management company and latent debt became the bad debt of the whole system at 3.79%. Therefore, monitoring the increasing trend and controlling bad debts is Vietnamese commercial banks' tough problem.

Economic growth positively correlated with the Vietnamese bank's performance. Economic development opens up more room for commercial banks in credit growth and cash flow, which helps commercial banks improve business results. Especially the popularity of the internet and the upgrading of Fintech activities contribute to resource improvement and sustainable economic development (Awais *et al.*, 2023). It has promoted the commercial bank's operation, which enhances the Vietnamese commercial bank's profit. The operational situation of Vietnamese commercial banks in the past two years is a typical example. Although heavily affected by the COVID-19 pandemic, the Vietnamese economy in general and bank performance have grown thanks to the application of Fintech in most activities, which leads in having a breakthrough in credit activity. It plays a fundamental role in increasing the Vietnamese commercial bank's performance.

One of the selling-point of the study is to test the relationship between the CEO's gender and the business performance of commercial banks. This research result is contrary to the views of Reinert *et al.* (2016) and Ting (2021) but is consistent with the reality of the banking business in Vietnam. According to a survey by Navigos Group – one of the largest human resource recruitment service providers, women often face invisible barriers. The female CEO has difficulty balancing work and family and lacks support and sympathy from her family. Furthermore, some social prejudices still exist in Vietnam. It still believes that women are weak in running businesses, which creates unfavourable results in negotiating and signing large contracts. However, the impact of CEO gender on business results of commercial banks is the lowest among all studied variables, almost negligible.

Based on the research results, the authors propose some solutions to improve Vietnamese commercial banks' performance as follows:

- Firstly, Vietnamese commercial banks need to improve governance efficiency by building and fostering a business culture so that governance becomes the bank's core activity towards sustainable development of the bank system.
- Secondly, Vietnamese commercial banks need to consider scaling concerning risk. The expansion is necessary to increase the customer network as well as the reputation of commercial banks. However, scaling can lead to increased risks, especially operational risk, when the new staff lacks experience and capacity.
- Thirdly, Vietnamese commercial banks need to monitor and control bad debts. Vietnamese commercial banks need to comply with the direction of the State Bank in structuring the repayment period, exempting and reducing loan interest for customers. It causes the short-term profits of commercial banks to decrease. However, the long-term business results of commercial banks will grow well when the business overcomes the challenging period due to the impact of the COVID epidemic as well as the significant fluctuations of the macroeconomy.
- Fourthly, Vietnamese commercial banks need to have a suitable roadmap to improve the CAR and financial capacity. From 2021 to 2023, Vietnamese commercial banks can apply ways to increase capital through internal financing from profit after tax (dividend in shares). In the period 2024–2025, Vietnamese commercial banks need to study and advise competent authorities to increase capital following the law, ensuring system safety.

Bank performance plays a significant role in the economy's sustainability. Therefore, the proposed recommendation has been impacting, directly and indirectly, on all subjects. Especially the test result demonstrated the relationship between CEO gender and bank performance. However, the study has some limitations, such as some factors that are likely

to influence bank performance have not yet been examined in this study. To increase the comprehensiveness of studying this topic, the following studies can consider other CEO characteristics such as work experience, education, age, stock ownership, concurrent position and personality traits that are likely to affect bank performance.

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No.	Acronym	The variable description		The reference papers	Expectation
<i>A1 The dependent variable</i>					
1	ROA	Net profit/total assets		Chandani <i>et al.</i> (2018); Handa (2019); Gupta and Mahakud (2020); Ting (2021); Stefanovic and Barjaktarovic (2021)	+
2	NIM	(Interest income – interest expense)/total assets		Lafuente and Vaillant (2019); Gupta and Mahakud (2020)	+
<i>A2 The independent variables</i>					
1	SIZE	The bank size	Logarit (total asset)	Jara-Bertin <i>et al.</i> (2014); Yang <i>et al.</i> (2019)	+
2	CAR	Capital adequacy ratio	Capital/risk-weighted assets	Jara-Bertin <i>et al.</i> (2014); Yang <i>et al.</i> (2019); Abdul Hadi <i>et al.</i> (2018); Aspal <i>et al.</i> (2019)	–
3	NPL	Credit risk	Bad debt ratio	Jara-Bertin <i>et al.</i> (2014); Abdul Hadi <i>et al.</i> (2018)	–
4	EFF	Management efficiency	Total operating expenses/total assets	Maudos and Fernandez de Guevara (2004); Maudos and Sohs (2009); Aspal <i>et al.</i> (2019)	+
5	GRO	Credit growth	New loan/total assets	Abdul Hadi <i>et al.</i> (2018)	+
6	OWN	Ownership structure	We have used a dummy variable as a notation of public bank. It equals one if it is ownership from the state higher than 50% of shares. Otherwise, it equals 0	Samet <i>et al.</i> (2018)	+
7	CEO	CEO gender	We have used dummy variables to stand for gender of CEOs: 1 stands for female and 0 for male	Endraswati (2018); Chandani <i>et al.</i> (2018); Handa (2019); Lafuente and Vaillant (2019); Gupta and Mahakud (2020)	+/-
8	GDP	The economic growth	IMF	Jara-Bertin <i>et al.</i> (2014)	+
9	INF	The overall inflation rate	IMF	Jara-Bertin <i>et al.</i> (2014); Yang <i>et al.</i> (2019)	+
10	LIR	The long-term lending interest rate	IMF	Tran <i>et al.</i> (2020)	+

Table A1.
Research model's
variables

Source: Table by authors

Test statistic	Value	df	Probability
<i>F</i> -statistic	0.866724	(3, 258)	0.4589
Chi-square	2.600171	3	0.4575

Table A2.
Result of Wald test

Source: Table by authors

Table A3.
Result of
heteroskedasticity
test

Panel period heteroskedasticity LR test
Null hypothesis: residuals are homoskedastic
Specification: NIM C SIZE CAR NPL EFF CEO GDP LIR

Indicators	Value	df	Probability
Likelihood ratio	24.56809	26	0.5435
<i>LR test summary</i>			
	Value	df	
Restricted LogL	1,032.488	286	
Unrestricted LogL	1,044.772	286	

Source: Table by authors

Corresponding author

Cuong Thanh Dang can be contacted at: dangthanhcuongktdhv@gmail.com

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