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THE DETERMINANTS OF NON-TRADITIONAL ACTIVITIES OF VIETNAMESE COMMERCIAL BANKS: THE ROLE OF WOMEN, PRIVATE SECTOR AND FOREIGN INVESTORS

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ABSTRACT

This study investigates the determinants and their influence on non-traditional banking activities among commercial banks in Vietnam, measured by non-interest income. Using a panel dataset of 23 listed Vietnamese commercial banks from 2010 to 2021, the research applies various panel data estimation techniques, including OLS, FEM, REM and GLS, to address potential model specification issues. However, the two-step Generalised Method of Moments (GMM) estimator is ultimately employed due to its robustness in handling endogeneity and dynamic relationships. The results reveal that operational efficiency, loan-to-deposit ratio and bank size positively impact non-traditional activities. In contrast, net profit margin, non-performing loan ratio and selected macroeconomic variables exert negative effects. Notably, the presence of women on the board of directors significantly moderates these relationships, reversing the impact of operational efficiency and macroeconomic factors. In addition, the study finds that banks in the private sector and those with foreign capital contributions demonstrate similar moderating patterns.

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However, the effects of equity dependence and capital adequacy differ from the baseline case. These findings highlight the importance of governance characteristics and ownership structure in shaping non-interest income strategies. The study offers new empirical evidence on the role of gender diversity on boards, private ownership, and foreign investor participation in influencing income diversification in the banking sector, particularly in an emerging market context.

Keywords: Non-traditional banking activities, Non-interest income, Female, Private sector, Foreign investment, Vietnam

INTRODUCTION

Interest and non-interest income are both essential sources of income for banking activities. However, traditional interest income is increasingly losing its competitive edge as new competition arises from non-bank financial institutions (Atellu, 2016). Tighter regulations and increased competition have led banks to develop non-traditional activities (Lozano-Vivas & Pasiouras, 2010). Banks are gradually changing their focus to invest more in non-traditional activities to diversify their investments (Stiroh, 2004) and minimise risks associated with traditional activities. Non-traditional activities have significantly increased bank profits (Pal, 2019). The transition from traditional to non-traditional activities has continued since the 1980s (DeYoung & Rice, 2004). Banks often generate non-interest income from collection service fees, credit card fees, deposit account fees, maintenance fees, check issuance fees and Automated Teller Machine (ATM) service fees. There is also income from foreign exchange trading and income from trading on the stock market.

Furthermore, Kiweu (2012) and Rotich et al. (2011) argue that banks should diversify by trading stocks, bonds, real estate and private equity to increase revenue. In Vietnam, in 2022, banks' non-interest income is differentiated when many banks record strong growth, but many banks also witness a decline in this source of income. Statistics from the financial statements of 28 banks in Vietnam show that the total non-interest income of these banks is VND125,052 billion, an increase of 11.4% compared to the previous year. However, the proportion of non-interest income to total income decreased by 1.7% compared to 2021. In addition, the project to restructure the system of credit institutions according to Decision No. 254/QD-TTg in 2012 and Decision No. 986/QD-TTg of 2018 on the banking industry development strategy with content related to income diversification is to gradually shift the business model of banks in the direction of reducing dependence on operational activities credit and increase income from non-credit service activities.

In globalisation, banks promote expanding non-interest income activities while regulations remain lax. The goals of banks when expanding non-banking activities are growth, gaining market share from competitors (Pal, 2019), and preventing risks (DeYoung & Rice, 2004). According to Bøhren and Staubo (2016), the low presence of women on corporate boards attracts the attention of scholars and policymakers. Researchers have increasingly recognised that the women's behaviour is generally more conservative and cautious (Cheng et al., 2022). Srinidhi et al. (2011) show a positive relationship between the presence of female audit committee members and earnings quality. In Vietnam, Nguyen et al. (2023) found that female CEOs have negative opinions about overall performance. Due to competitive pressure and the need to maximise profits and minimise risks for commercial banks, some earlier studies (Abedifar et al., 2018; Ammar & Boughrara, 2022; Atellu, 2016; Boungou & Mawusi, 2022; Chiorazzo et al., 2008; Damankah et al., 2014; DeYoung & Rice, 2004) focused on non-traditional activities or non-interest income. However, these studies still have limitations in exploring the impact of bank size, the presence of women on boards, private sector groups and foreign investments. So, in the Vietnamese commercial banking context, we wonder what factors significantly affect the effectiveness of non-traditional activities. Besides, what impact does the presence of women, the private sector and foreign investment have?

In this study, the theoretical frameworks used are risk management theory (Pyle, 1999) and portfolio theory (Constantinides & Malliaris, 1995), with the primary goal of clarifying the influence and level of the impact of these theories on non-traditional activities. At the same time, in this study, the authors intend to contribute to:

1. The existing theoretical basis on redefining the influencing factors and level of impact on non-traditional activities in the Vietnam market.
2. Emphasise the role of women in the Board of Directors, who are affected by other factors and limit investment in non-traditional activities due to their cautious and risk-averse nature in Vietnamese banks, where there is a lack of study about this.
3. Private or foreign-invested banks tend to actively promote investment in non-traditional activities to minimise risks from lending activities and diversify income for Vietnamese banks where the financial market is still relatively young compared to developed countries.

Therefore, the research results can support bank managers and policymakers in making appropriate decisions to diversify income and reduce pressure on bad debt ratios or risks from traditional activist movements.

LITERATURE REVIEW

Constantinides and Malliaris (1995) examined investment tactics to assist investors in achieving their goals. To maximise an investment portfolio, the authors also emphasise the need for diversification, stressing the importance of owning various assets to minimise risk. The investment portfolio must be distributed among several asset classes, such as stocks, bonds and real estate, to attain the appropriate risk and return. This process is done through asset allocation. Pyle (1999) explains that banks control risk by maintaining an equity buffer as a safety net against unforeseen losses. By spreading risk across a portfolio of loans, the impact of any default by a borrower is reduced. Regulatory capital requirements are suggested as a way to help ensure that banks have sufficient equity capital.

According to Chiorazzo et al. (2008), income diversity is essential to increasing efficiency and reducing any organisation's risk. Due to the increasing contribution of non-traditional activities to bank profits, this issue has gained tremendous importance and attracted significant academic attention (Tortosa-Ausina, 2003). As a result, usual activities, including deposit-taking and lending, have decreased (Damankah et al., 2014). Many studies have been conducted to examine the non-traditional activities of banks (Abedifar et al., 2018; Ammar & Boughrara, 2022; Atellu, 2016; Boungou & Mawusi, 2022; Chiorazzo et al., 2008; Damankah et al., 2014; DeYoung & Rice, 2004; Kiweu, 2012; Lozano-Vivas & Pasiouras, 2010; Pal, 2019; Rotich et al., 2011; Stiroh, 2004; Suryanto et al., 2021; Thach et al., 2021; Tortosa-Ausina, 2003).

Atellu (2016) focuses on the determinants of the non-interest income of Kenyan commercial banks, independent of interest rates. The study found essential variables, such as bank size, lousy debt ratio, net profit margin and capital ratio, can affect a bank's non-interest revenue. The author also found that banks with higher net profit margins tend to have higher non-interest income levels independent of interest rates. However, the capital ratio has little to do with non-interest income and is independent of interest rates. Furthermore, the study shows a significant relation between non-traditional activities, such as asset management and financial investment services and non-interest income that does not depend on bank interest rates.

Furthermore, Suryanto et al. (2021) demonstrated that liquidity and bank performance positively impact non-interest income. However, they only focused on banks in Indonesia, so these findings cannot be generalised to other countries. Thach et al. (2021) focused on the role of non-interest income and competitors

on the performance of commercial banks in Vietnam, and they demonstrated that larger banks tend to have higher non-interest income, while smaller banks tend to have fewer competitors and lower performance.

Hahm (2008) extended the study of non-interest income diversification of banks in 23 OECD (Organisation for Economic Co-operation and Development) countries from 1995 to 2004 and found that it was influenced by many factors, including regulation, banking model, asset management, bad debt ratio and competition in the banking industry. The author points out that diversifying non-interest income can improve banks' business efficiency and affect risk and business efficiency when the business environment changes. However, the study is too broad, and the data is too outdated, as regulations and business perspectives have changed somewhat over the years and, therefore, need to be updated for comparison purposes. Similar results were found in studies by Isshaq et al. (2019), Köhler (2014) and Pal (2019). However, Pal (2019) did not consider other variables, such as loan interest rates, operating costs and capital costs. Therefore, the study could not evaluate the relationship between these factors and the bank's non-interest income, profitability and risk. On the other hand, Isshaq et al. (2019) did not consider other variables such as interest rates, assets, or bank capital.

Meyappan et al. (2019) argued that asset management, operating costs and customer base influence the non-interest income of banks. Research indicates that banks focus on developing non-interest income products to achieve operational sustainability but often consider these factors individually, failing to account for the interaction between them and the bank's non-interest income. Here, the authors did not provide specific recommendations for banks to enhance their non-interest income. Boungou and Mawusi (2022) confirm that economic policy instability negatively affects banks' non-interest income activities, especially in asset management and securities trading.

Bennouri et al. (2018) used 394 French companies from 2001 to 2010 to examine the role of female directors concerning return on assets (ROA), return on equity (ROE) and Tobin's Q. The results show that female directors positively affect ROA and ROE but are negative with Tobin's Q. However, this study did not consider the influence of women on the effectiveness of non-traditional activities. In addition, Fan et al. (2019) looked at how having women on the board would affect a bank's profitability, and they also raised concerns about the issue of gender diversity on executive boards or boards of directors. The above research results show that the link has an inverted U shape. Banks tend to have lower earnings when there are few or no female directors.

On the other hand, the bank's profit management will decline if there are three or more female directors. Yu et al. (2017) also examined gender diversity in corporate leadership roles in the banking sector and how it affects banks' risk based on their monthly stock return volatility. It has been found that there is a positive correlation between bank risk and the proportion of female executives. However, the proportion of female members in corporate governance and audit committees is inversely related to bank risk. Additionally, during the financial crisis, women in all positions saw a decrease in banking risk. Further, financial performance increases when more women serve on boards of directors Owen and Temesvary (2018). However, due to the limited understanding of the authors, it has not been discussed in the context of the non-traditional operations of commercial banks.

Isik (2007) asserted that private ownership appears more environmentally adaptable. The author also investigated the origins of productivity and efficiency growth in Turkish banks, focusing on the early post-liberalisation experiences of domestic, international and private banks doing business in Turkey. According to the author, foreign banks are growing more productively than publicly held banks, with the former having a slower expansion rate. Scale-related improvements accounted for most productivity increases for public banks, but enhanced capital efficiency at private (domestic or international) banks produced more considerable productivity gains. Prior research on the private sector and foreign ownership has frequently concentrated on overall profitability (Haralayya & Aithal, 2021) and organisational culture (Gupta et al., 2021). Nevertheless, non-traditional activities have received little attention.

While much research literature explores the determinants of non-traditional commercial banking activities such as asset management and financial investment services, there remains a gap in understanding the specific roles of women, private ownership and foreign investors in influencing these activities. Existing studies mainly focus on regulation, banking models, asset management, non-performing loan (NPL) ratio and competition. Still, they are not extensive enough to explore the differential impacts of gender diversity, ownership structure and foreign investment in non-traditional banking activities. Furthermore, studies on the benefits and risks of women's representation on executive boards or boards of directors have not been placed in the context of non-traditional banking activities. Similarly, while previous studies have examined ownership-based banks' productivity and efficiency growth, especially the differences between domestic, international and private banks, no research currently focuses on how ownership structure affects the adoption and performance of non-traditional banking activities. Therefore, this research elucidates the specific contributions of women, private ownership and foreign investors to the non-traditional activities of commercial banks and their impact on bank performance and risk management in diverse contexts, such as Vietnam.

Following a review of earlier research and related theories, the authors developed the conceptual framework, as shown in Figure 1.

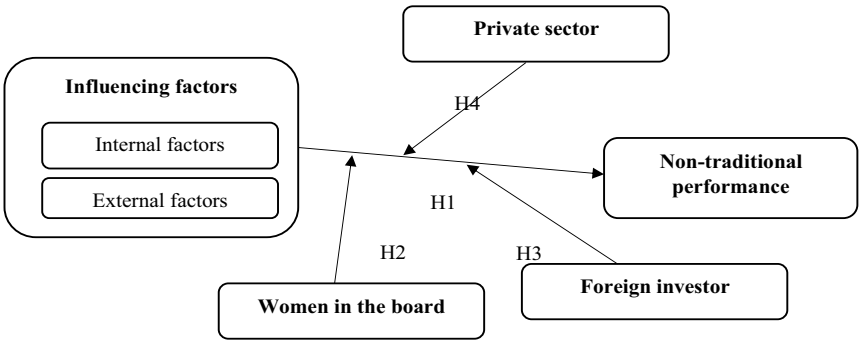

Figure 1: The conceptual framework

Based on the previous studies, this study proposes four hypotheses as follows:

H1: Internal and external factors affect the effectiveness of non-traditional activities at Joint Stock Commercial Banks.

H2: Having women on the board negatively affects the effectiveness of non-traditional activities at a Joint Stock Commercial Bank.

H3: Foreign investment positively affects the efficiency of non-traditional activities at Joint Stock Commercial Banks.

H4: The private sector positively affects the effectiveness of non-traditional activities at Joint Stock Commercial Banks.

RESEARCH DATA AND METHODS

Data

The researchers collected data from multiple sources, including annual reports, financial statements and annual business performance reports of commercial banks in Vietnam from 2010 to 2021. The publicly listed banks are selected to ensure data reliability and adequate data for calculation. As a result, the dataset comprised 276 observations from 23 listed banks, encompassing a diverse range of sizes and ownership structures, including state-owned, private and joint-stock banks. Given their substantial influence on domestic financial activities, these selected banks are deemed representative of the overall banking industry in Vietnam.

Research Methods

To examine the impact of factors affecting non-traditional activities in commercial banks, we developed a model based on previous studies by Ammar and Boughrara (2022), Atellu (2016), Boungou and Mawusi (2022) and Damankah et al. (2014).

The general multivariate regression model developed is as follows:

$$Y_t = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \ldots + u_t$$

Where, Y_t = The dependent variable; β_0 = The intercept; X_1, X_2, X_3, X_4, ... = The independent variables; $\beta_1, \beta_2, \ldots, \beta_n$ = The regression coefficients and u_t = the error.

Previous studies have used the ordinary least squares (OLS) model to explore the relationship between non-traditional activities and influencing factors. OLS is a simple and robust statistical model used in economics, finance and social sciences to estimate linear regression parameters. However, it requires independent, homogeneity and standard error distribution assumptions. If these assumptions are violated, OLS estimates may be inaccurate and susceptible to outliers and non-normally distributed errors. Alternative methods like non-parametric regression or modified linear regression models may be used. Therefore, some authors (Brahmana et al., 2018; Chiorazzo et al., 2008; Zhou, 2014) have used other models as replacements, such as fixed effects models (FEM) and random effects models (REM). The FEM method is a statistical model that can handle unobserved variables and reduce errors in estimating independent variables' impact on dependent variables. It is effective when minimal or repeating groups apply only to quantitative variables and cannot address categorical variables. FEM requires specialised computation tools, leading to computational constraints and challenges. The FEM model is not suitable for models with many groups or those with repeated properties. The REM model enhances the accuracy of estimates by reducing data noise, accommodating categorical variables and minimising unobserved variation, thereby improving the assessment of independent variables' influence on dependent variables. However, it is unsuitable for models with limited or uneven samples, requires special calculation tools and assumes random variables from a large population, potentially leading to inaccurate estimations. Starting from the arguments about the shortcomings of using the Generalised Least Squares (GLS) model presented by Abedifar et al. (2018), Ganefi et al. (2021) and Mensi and Labidi (2015) employed the GMM model, and Lozano-Vivas and Pasiouras (2010) used the DEA method to address the limitations in multivariate regression models.

In this study, the authors emphasised the use of the GMM model because of its high flexibility in applying to various types of models, from linear to non-linear, and its ability to generate more accurate estimates than traditional linear regression methods in cases where independent variables are subject to errors or jamming. Additionally, GMM can be applied to incomplete data where some values are missing or unobserved. Even when endogenous assumptions are violated, the GMM method yields robust, unbiased, normally distributed and efficient estimated coefficients, as agreed upon by Saif-Alyousfi and Saha (2021). Furthermore, the GMM estimator solves the problem of the unit root property and provides more accurate results (Saif-Alyousfi, 2019). Hall (2005) and Saif-Alyousfi (2019) emphasised that GMM estimation is more efficient than two-stage least squares (2SLS) or 3SLS because it accounts for heterogeneity. Besides, the number of instruments must be smaller than the number of groups, and AR2, Hasen and Sagan tests must meet the conditions.

A generalised regression model is presented using GMM for research as follows:

$$NII_{it} = \alpha_0 + \alpha_1 \times \text{L.NII}_{it} + \alpha_2 \times \text{ROE}_{it} + \alpha_3 \times \text{ROA}_{it} + \alpha_4 \times \text{NIM}_{it} + \alpha_5 \times \text{ETA}_{it} + \alpha_6 \times \text{DOL}_{it} + \alpha_7 \times \text{CAR}_{it} + \alpha_7 \times \text{NPL}_{it} + \alpha_8 \times \text{LDR}_{it} + \alpha_9 \times \text{SIZE}_{it} + \alpha_{10} \times \text{GDP}_{it} + \alpha_{11} \times \text{INF}_{it} + \varepsilon_{it}$$

Definition of variable

Non-interest income (NII): According to Damankah et al. (2014), banks often have reserves for non-traditional activities that influence decisions about other specific activities, especially non-traditional activities. With the principle of risk prevention, banks increasingly expand risk allocation channels to maximise profits and compensate for shortfalls in lending. This index is used as a proxy when referring to non-traditional activities in several studies (Hidayat et al., 2012; Nguyen, 2012; Thakur & Arora, 2023; Vithyea, 2014).

The formula for calculating non-interest income is as follows:

Non-interest income (NII) = Total income – Net interest income

Return on equity (ROE), return on assets (ROA) and net interest margin (NIM) represent the efficiency of bank operations. Atellu (2016) stated that high operational efficiency leads to high non-interest income. Slight increases in non-interest income are related to significantly lower risk-adjusted operational efficiency (Ng'endo, 2012). Hidayat et al. (2012), Lee et al. (2014), and Saif-Alyousfi and Saha (2021) used ROA and ROE indicators as a proxy for

operating efficiency. Nguyen (2012) found a statistically significant inverse relation between NIM and NII from 1997 to 2002, while a positive relation was observed during the subsequent period (2003–2004), although it was not statistically significant.

The formula to calculate ROA, ROE and NIM is as follows:

$$\text{ROA} = \frac{\text{Net income}}{\text{Average assets}} \times 100\%$$

$$\text{ROE} = \frac{\text{Net income}}{\text{Shareholders' equity}} \times 100\%$$

$$\text{NIM} = \frac{\text{Net interest margin}}{\text{Interest} - \text{Earning assets}} \times 100\%$$

The equity-to-asset ratio (ETA) is used to capture the impact of the regulation repeal on the growth of non-interest income in commercial banks. Some studies have found evidence of the relationship between ETA and non-traditional activities (Atellu, 2016; Busch & Kick, 2009).

The formula of ETA is:

$$\text{ETA} = \frac{\text{Equity}}{\text{Total asset}}$$

Degree of operating leverage (DOL) refers to the degree to which a business or bank incurs fixed costs to maintain its operations. As the level of operating leverage increases, the ratio of fixed and variable costs increases, and the production or provision of services becomes more expensive. According to DeYoung and Roland (2001), a bank shifting its product mix from interest-based activities on traditional assets to non-interest fee-based activities tends to increase its "operating leverage." A higher operating leverage puts banks at greater business risk and exposes them to danger if they cannot cover fixed costs with revenue from non-traditional activities (Dang & Dang, 2021; DeYoung & Torna, 2013). Therefore, operating leverage is related to non-traditional activities through risk management.

The formula of DOL is as follows:

$$\text{DOL} \quad \frac{\text{Debt}}{\text{Total asset}}$$

The capital adequacy ratio (CAR) is an economic indicator reflecting the relationship between a commercial bank's equity capital and risk-adjusted assets. According to Damankah et al. (2014), if this ratio is too high, the bank may be operating too cautiously and overlooking investment opportunities with potential profitability. Rogers and Sinkey (1999) argued that banks with higher capital can better absorb losses from non-traditional activities.

$$CAR = \frac{\text{Equity capital}}{\text{Risk Weighted Assets}\left(\text{RWA}\right)}$$

The non-performing loan ratio (NPL), which is measured by the ratio of loan loss provision over total loans (Tan & Floros, 2013), has contributed to deterring banks from engaging in lending activities, even with higher customer deposits and instead focusing on other sources of revenue such as government securities repurchase and government bond securitisation (Damankah et al., 2014). Karkowska (2019) also pointed out the relationship between NPL and NII.

The formula of NPL is as follows:

$$\text{NPL} = \frac{\text{Total nonperforming loan}}{\text{Total gross loans}}$$

The loan-to-deposit ratio (LDR) indicates traditional lending on funds collected from idle money in society. This factor has been examined in several studies related to non-interest income (Karkowska, 2019; Ruocan & Youqing, 2018) and demonstrated its impact on non-banking activities.

The formula of LDR is as follows:

$$\text{LDR} = \frac{\text{Total loans}}{\text{Total deposits}}$$

Bank size (SIZE) is calculated as the natural logarithm of the bank's total assets. According to Damankah et al. (2014), the size of the bank influences investment decisions. Rogers and Sinkey (1999) also suggested that bank size is an apparent factor related to involvement in non-traditional activities. Larger banks usually have certain economic privileges over smaller banks (Damankah et al., 2014). Furthermore, larger banks diversify and manage risks well (Atellu, 2016; Busch & Kick, 2009; Chiorazzo et al., 2008; Kiweu, 2012). Hunter and Timme (1986) also found that larger banks are better equipped to adopt new technologies and exploit

cost-saving and/or efficiency-enhancing measures. The bank size is measured as a natural logarithm of total assets.

Gross domestic product (GDP) growth is often used to measure the rate of economic growth. This factor has been examined in studies by Chiorazzo et al. (2008), Craigwell and Maxwell (2006), DeYoung and Rice (2004), and Sanya and Wolfe (2010). Kiweu (2012) found in his study on commercial banks in Kenya that macroeconomic variables also play an equally important role in determining non-interest income. Hahm (2008) pointed out that in the case of an economic slowdown, banks may expand their non-interest income.

The formula of economic growth is as follows:

$$\text{GDP} = \frac{\text{GDP}_n - \text{GDP}_{n-1}}{\text{GDP}_{n-1}} \times 100\%$$

Inflation (INF) refers to an increase in the general price level of goods and services in an economy. Hahm (2008) argued that long-term capital markets, such as bonds and savings accounts, are usually not encouraged when inflation is high. Conversely, when inflation is low, capital markets allow for expanding non-interest income for commercial banks (DeYoung & Rice, 2004).

The formula of inflation is as follows:

$$\text{INF} = \frac{P_n - P_{n-1}}{P_{n-1}} \times 100\%$$

Previous research has identified a research gap in exploring the impact of gender and private sector banks on the non-interest income activities of banks. Therefore, the authors added the variables of gender, private sector banks, and foreign investor contribution to the model. The new formula is presented as follows:

$$\begin{aligned} NII_{it} = {} & \alpha_0 + \alpha_1 \times L.NII_{it} + \alpha_2 \times ROE_{it} + \alpha_3 \times ROA_{it} + \alpha_4 \times NIM_{it} + \alpha_5 \times \\ & ETA_{it} + \alpha_6 \times DOL_{it} + \alpha_7 \times CAR_{it} + \alpha_7 \times NPL_{it} + \alpha_8 \times LDR_{it} + \alpha_9 \times \\ & SIZE_{it} + \alpha_{10} \times GDP_{it} + \alpha_{11} \times INF_{it} + \alpha_{12} \times Dummy_{it} + \varepsilon_{it} \end{aligned}$$

Dummy represents the dummy variable for gender (1 if there is at least one female member on the board of directors and 0 otherwise), region (1 if the bank belongs to private ownership and 0 otherwise) and foreign ownership (1 if there is foreign investment and 0 otherwise).

RESEARCH RESULTS AND DISCUSSION

Before conducting regression analysis, the authors performed descriptive statistics to provide an overview of the data used in the study. Table 1 shows that the dependent variable, non-interest income (NII), representing non-traditional activities in the study, has a mean value of 0.0093 and a standard deviation of 0.0087. This indicates a relatively low variability of NII in the sample. The minimum value of NII is –0.0504, which could be due to expenses exceeding non-interest income. The maximum value of NII is 0.0760, indicating that some banks in the sample have high non-interest income. Furthermore, Table 1 presents the minimum and maximum values of each variable included in the study and the standard deviation of each variable. In addition, frequency statistics for the FCEO, PB and SOB variables are also provided in Table 2.

Table 1
Descriptive statistics of variables in the model

Variable	Obs	Mean	S. D.	Min	Max
NII	276	0.0093	0.0087	–0.0504	0.0760
ROE	276	0.1082	0.0859	–0.5633	0.3033
ROA	276	0.0094	0.0085	–0.0599	0.0557
NIM	276	0.0916	0.0310	0.0524	0.3826
ETA	276	0.0906	0.0387	0.0406	0.2527
DOL	276	0.0126	0.0122	0.0014	0.0677
CAR	276	0.1255	0.0460	0.0224	0.4015
NPL	276	0.0412	0.1691	0.0002	1.4303
LDR	276	0.8727	0.2004	0.3633	1.7893
SIZE	276	31.3254	3.7633	17.0186	34.9553
GDP	276	0.0572	0.0144	0.0258	0.0708
INF	276	0.0553	0.0470	0.0063	0.1858

Notes: ROE, ROA and NIM represent the efficiency of the bank's operations; ETA means the degree of the firm's dependence on equity capital to finance its business activities and measures the firm's ability to repay debt and sustain long-term growth; DOL is the financial leverage of the bank; CAR represents the bank's capital adequacy ratio as stipulated by Basel regulations; NPL is the non-performing loan ratio; LDR is the loan-to-deposit ratio; SIZE is the bank's scale (logarithm of assets); GDP and INF are macroeconomic variables representing economic growth and inflation, respectively. (Source: Authors summarise from regression results by Stata software).

Table 2
Descriptive statistics of dummy variables (binary data)

Variable	Frequency	%	Cumulative (%)
FCEO			
0	242	87.68	87.68
1	34	12.32	100
Total	276	100	
SOB			
0	240	86.96	86.96
1	36	13.04	100
Total	276	100	
PB			
0	37	13.41	13.41
1	239	86.59	100
Total	276	100	

Notes: The dummy variable for gender (FCEO) (1 if there is at least one female member on the board of directors and 0 otherwise), region (PB) (1 if the bank belongs to private ownership and 0 otherwise), and foreign ownership (SOB) (1 if there is foreign investment and 0 otherwise). (Source: Authors summarise from regression results by Stata software).

Table 3 shows the relation between variables linked to each other in a linear regression model. The correlation coefficient values can range from –1 to 1, where 1 or –1 indicates a perfectly positive or negative relation between two variables, and a value close to 0 indicates no relation between two variables. Generally, the level of correlation between variable pairs is not too high, except for the ROA and ROE variables, which have a correlation coefficient of 0.8348. However, a high correlation does not necessarily imply a causal relation between two variables. It only indicates a linear relation between two variables, meaning that when one variable's value changes, the other variable's value tends to change in the same or the opposite direction.

Table 3
Results of testing the correlation between variables

	NII	ROE	ROA	NIM	ETA	DOL	CAR
NII	1.0000						
ROE	0.1022	1.0000					
ROA	0.2149**	0.8275**	1.0000				
NIM	–0.0338	0.0202	0.1774*	1.0000			
ETA	0.2576**	–0.1351*	0.2863**	0.3579**	1.0000		
DOL	–0.0188	–0.2500**	–0.0127	0.1893**	0.5139**	1.0000	
CAR	0.2343**	–0.0950	0.0988	0.1420*	0.4885**	0.2286**	1.0000
NPL	–0.0562	–0.0770	–0.0283	0.0757	0.0887	0.0061	–0.1322*
LDR	0.1303*	0.3005**	0.3415**	0.2849**	0.1946**	0.0495	–0.1014
SIZE	–0.0191	–0.0387	–0.1305*	0.0751	–0.1425*	–0.0281	–0.0952
GDP	–0.013	–0.1280*	–0.1634**	0.1022	–0.0072	0.0728	0.0278
INF	–0.0007	0.0250	0.1088	0.6909**	0.2473**	0.0691	0.1613*
PB	0.1311*	0.0227	0.0543	–0.1753*	0.0739	–0.0303	0.0639
SOB	0.0444	0.2118**	0.0096	–0.1903**	–0.2727**	–0.1321*	–0.1940**
FCEO	–0.0321	–0.1259*	–0.0666	0.1308*	0.0989	0.2748**	–0.0420

(*Continued*)

Table 3 (*Continued*)

	NPL	LDR	SIZE	GDP	INF	PB	SOB	FCEO
NII								
ROE								
ROA								
NIM								
ETA								
DOL								
CAR								
NPL	1.0000							
LDR	0.1119*	1.0000						
SIZE	0.0004	–0.0638	1.0000					
GDP	0.0258	–0.0175	0.6158**	1.0000				
INF	0.0718	0.1255*	0.1234*	0.1105	1.0000			
PB	0.0458	–0.0461	0.0196	–0.0043	–0.0069	1.0000		
SOB	–0.0530	0.1454*	0.1864**	0.0000	0.0000	0.1283*	1.0000	
FCEO	–0.0465	0.0875	–0.0828	–0.0105	–0.0867	–0.1894**	–0.1345*	1.0000

Notes: ** and * Correlation is significant at the 0.01 and 0.05 levels, respectively (2-tailed). ROE, ROA and NIM represent the efficiency of the bank's operations; ETA means the degree of the firm's dependence on equity capital to finance its business activities and measures the firm's ability to repay debt and sustain long-term growth; DOL is the financial leverage of the bank; CAR represents the bank's capital adequacy ratio as stipulated by Basel regulations; NPL is the non-performing loan ratio; LDR is the loan-to-deposit ratio; SIZE is the bank's scale (logarithm of assets); GDP and INF are macroeconomic variables representing economic growth and inflation, respectively. (Source: Authors summarise from regression results by Stata software).

Relying solely on correlation to make decisions or inferences can lead to errors or incorrect conclusions. It is essential to examine whether multicollinearity exists before eliminating highly correlated variables. A multicollinearity test was conducted, and the results are presented in Table 4.

Table 4
Multicollinearity Test

Variable	1/VIF
ROA	0.154131
ROE	0.160895
ETA	0.323221
NIM	0.474102
INF	0.523855
SIZE	0.585561
GDP	0.595597
CAR	0.662667
DOL	0.664871
LDR	0.734739
NPL	0.922753
Mean VIF	2.61

Table 4 provides each independent variable's VIF (variance inflation factor) and the corresponding 1/VIF values. VIF measures the degree of multicollinearity in a multiple-regression analysis. It provides an index measuring the extent to which a regression coefficient estimate's variance (the standard error squared of the forecast) is increased due to multicollinearity. In the table, the mean VIF is 2.61, lower than the average VIF of 5. This indicates that there is no serious issue with multicollinearity in the model. However, some variables have relatively high VIF values, particularly ROA and ROE (with VIF values of 6.49 and 6.22, respectively). Nonetheless, VIF values below ten don't have enough evidence of multicollinearity. Therefore, the variables included in the model are entirely appropriate.

Following the variable selection process, regression analysis was conducted using three models: OLS, FEM and REM. The weaknesses of these models were also tested to determine the most appropriate model for the study.

Firstly, the researchers chose among these three models, and the results from Table 5 showed that the FEM model was the most suitable since the F-test yielded F > 0.05. On the other hand, the Hausman test resulted in (Prob > chi^2 = 0.1244 > 0.05) between the FEM and REM models, indicating that the REM model was the most appropriate.

Table 5
Results of the F-test and Hausman test

F test (OLS – FEM) F (22, 242) = 3.25	> 0.05	FEM
Hausman test (FEM – REM) Prob > chi^2 = 0.1244		REM

(Source: Authors summarise from regression results by Stata software)

Table 6
Results of test of variance of variance and autocorrelation

Wooldridge test for autocorrelation in panel data	
Prob > F = 0.1963	> 0.05
Breusch and Pagan Lagrangian multiplier test	
Prob > $chibar^2$ = 0.0000	< 0.05

(Source: Author's summarise from regression results by Stata software)

Furthermore, additional tests were conducted on the changing error variance and the autoregressive conditional heteroscedasticity phenomenon to check for any detection in the REM model. The REM model had changing error variance (see Table 6). Since the model exhibited varying error variance, the GLS model was chosen to overcome this issue. Nevertheless, as outlined in the methodology section, the GMM model is more robust and capable of handling multiple econometric issues, including endogeneity and dynamic panel effects. The regression results across all estimation techniques (OLS, FEM, REM, GLS and GMM) are presented in Table 7. A comparative evaluation of these models reveals that the GMM estimator provides superior results in terms of statistical validity and model performance. Therefore, the analysis and interpretation of variable effects are based on the findings from the GMM model.

Table 7
Regression results of OLS, FEM, REM, GLS and GMM models

Variables	OLS	FEM	REM	GLS	GMM
			NII		
ROE	–0.00379	–0.0467***	–0.0207	0.0232**	0.0808*
	[–0.27]	[–3.10]	[–1.45]	[2.56]	[1.92]
ROA	0.276*	0.560***	0.394***	0.131	–0.269
	[1.90]	[3.77]	[2.73]	[1.22]	[–0.50]
NIM	–0.0620***	–0.0287	–0.0519**	–0.0514***	–0.193***
	[–2.73]	[–1.04]	[–2.14]	[–4.36]	[–2.71]
ETA	0.0588***	0.0242	0.0436*	0.0645***	0.305***
	[2.67]	[0.96]	[1.90]	[3.90]	[4.61]
DOL	–0.0348	–0.0143	–0.0332	–0.0117	–0.162
	[–0.71]	[–0.14]	[–0.57]	[–0.33]	[–1.02]
CAR	0.0066	–0.00622	0.0037	0.0152*	–0.0471
	[0.51]	[–0.38]	[0.27]	[1.72]	[–1.47]
NPL	–0.00424	–0.00759**	–0.00529*	–0.00212	–0.00543***
	[–1.42]	[–2.23]	[–1.70]	[–0.83]	[–2.82]
LDR	0.00309	0.00469	0.00381	0.00216	0.0159***
	[1.09]	[1.42]	[1.28]	[1.38]	[2.77]
SIZE	0.00023	–0.00000436	0.000143	0.000251***	0.000395***
	[1.37]	[–0.03]	[0.87]	[2.81]	[4.07]
GDP	–0.0278	0.00261	–0.0159	–0.0116	–0.0512**
	[–0.64]	[0.06]	[-0.38]	[–0.50]	[–2.14]
INF	0.000794	–0.00782	–0.00134	–0.0183**	–0.135*
	[0.06]	[–0.52]	[–0.09]	[–2.37]	[–1.88]
L.NII					–0.745**
					[–2.08]
_cons	–0.00114	0.00709	0.00196	–0.00535*	–0.00808
	[–0.21]	[1.28]	[0.37]	[–1.79]	[–0.78]
N	276	276	276	276	253

Notes: ROE, ROA and NIM represent the efficiency of the bank's operations; ETA represents the degree of the firm's dependence on equity capital to finance its business activities and measures the firm's ability to repay debt and sustain long-term growth; DOL is the financial leverage of the bank; CAR represents the bank's capital adequacy ratio as stipulated by Basel regulations; NPL is the non-performing loan ratio; LDR is the loan-to-deposit ratio; SIZE is the bank's scale (logarithm of assets); GDP and INF are macroeconomic variables representing economic growth and inflation, respectively. ***, ** and * indicate statistical significance levels of 1%, 5% and 10%, respectively. (Source: Authors summarise from regression results by Stata software).

From the regression results of the GMM model, we get the following formula for the model:

$$NII = -0.00808 - 0.745 \times L.NII + 0.0808 \times ROE - 0.193 \times NIM + 0.305 \times ETA - 0.00543 \times NPL + 0.0159 \times LDR + 0.000395 \times SIZE - 0.0512 \times GDP - 0.0183 \times INF$$

This regression analysis does not provide sufficient evidence to conclude whether ROA, LEV and CAR impact the non-interest income activities of banks represented by NII. Equity-to-assets (ETA) and NIM are two factors that significantly influence the non-interest income activities of a bank at a 1% level of significance. Specifically, a one-unit increase in NIM and ETA leads to a decrease of approximately 0.193 units and an increase of 0.305 units in NII, respectively. The results suggest that banks with a higher NIM should focus more on lending, especially to individuals or businesses with higher interest rates, to increase their volume and profits. However, this may lead to an increase in bad debt and credit risk. Additionally, a higher NIM may reduce the attractiveness of the bank to depositors, thereby reducing the capital base for non-interest income activities.

A business's reliance on equity to finance its operations and its ability to repay debt and achieve long-term growth, measured by the ETA ratio, is an essential factor in this study. An increase in ETA indicates a stronger financial position for the bank, meaning the bank owns more assets through equity rather than relying on customer deposits. This reflects better financial stability and improved liquidity for the bank. It helps build trust with customers, investors and other stakeholders. This credibility helps the bank attract funding sources and financial partners, expanding its ability to carry out non-traditional activities. Furthermore, a high ETA represents a bank with many assets that can be converted into cash flexibly, increasing access to accessible funding sources, including loans from financial institutions and investors. Therefore, increasing the equity-to-total assets ratio can help the bank expand its non-interest income activities.

Furthermore, inflation has a significant impact on the NII, with a 90% level of confidence. This is simple to understand because inflation is the steady rise in product and service prices over time, which raises the overall cost of goods and services. Banks will find investing in non-traditional businesses like insurance, asset management, and securities brokerage challenging when inflation rises. In securities brokerage activities, when inflation increases, the value of stocks and securities will decrease, reducing the bank's profit from this activity. Similarly, insurance payouts also increase in insurance activities due to the price of insurance assets. Therefore, banks will face difficulties providing insurance services and reducing profits. This has also been found in the study by Atellu (2016).

In addition, the higher the ROE, the more effectively a bank uses its equity capital. It also increases its ability to strengthen its equity base to expand its non-traditional business activities. Research results demonstrate this clearly, with a 1 unit increase in ROE leading to a 0.080 unit increase in NII. This finding is consistent with the research of Atellu (2016), DeYoung and Roland (2001), and Suryanto et al. (2021). Diversifying non-interest income sources means that the bank has additional sources of revenue besides interest income from lending. This helps the bank diversify its revenue streams and reduce its reliance on interest income from lending. In terms of the NPL ratio to total outstanding loans, when NPLs increase, banks have to spend more time and resources dealing with NPLs, including seeking capital restructuring solutions, negotiating loan agreements, collecting debts and implementing legal measures. These activities can be costly and resource-intensive, reducing the bank's ability to invest in non-traditional activities.

Furthermore, when NPLs increase, banks may also have to raise their provision for bad debts to deal with the risk of non-performing loans, which will reduce the income earned from credit activities. This will reduce the bank's non-interest income and affect its business operations. This study shows that a unit increase in NPLs will lead to a 0.00543 decrease in the bank's non-interest income at the 1% significance level. This result is similar to that of Atellu (2016).

Meanwhile, an increase in the LDR indicates that the bank prioritises traditional lending activities over expanding into non-traditional ones. However, intensifying lending activities may help the bank attract more customers, creating opportunities to expand its non-lending services and products. This could promote non-traditional operations and generate non-interest income for the bank, although the contribution may be insignificant. Yuliani (2007) also suggested that increasing the LDR ratio under normal conditions may boost the bank's non-interest income. Similarly, the scale of the bank plays an essential role in non-traditional business operations and non-interest income, but at an insignificant level of 0.000395 units for NII when the bank increases its scale by one unit. This result is supported by Atellu (2016), Thach et al. (2021) and Thach et al. (2022). As the bank's scale increases, it can enhance investments in non-traditional activities such as securities brokerage, insurance, asset management and other financial services.

As an illustration, a bank with a substantial scale of operations can provide securities brokerage services to its clientele. In contrast, a smaller bank may lack the resources to engage in non-traditional activities and instead concentrate solely on lending and savings. Furthermore, a larger bank possesses the potential to expand its insurance operations and offer asset management services to customers,

thereby diversifying its revenue streams, bolstering its competitive advantage, and facilitating business expansion. Finally, the financial market is usually stable in a high-growth economic environment, and traditional banking activities such as lending and deposits will increase. However, non-traditional banking activities such as securities trading, financial advisory, high-risk investment and other financial services may decrease as investors no longer have an interest in high-risk investments but shift to safer investments (Atellu, 2016).

Influence of gender diversity in the Board of Directors

In Table 8, column 4, it is evident that the presence of women on the board of directors harms NII. Three factors can explain this. Firstly, the presence of women on the board of directors can influence decision-making and resource allocation at the bank. Female board members might prioritise conventional and less risky business endeavours, leading to an increased emphasis on traditional activities and a reduced allocation of resources toward non-traditional ventures. Secondly, the presence of women on the board may affect management style and customer relations, as women may emphasise interaction and emotions over procedures, data and financial performance. This inclination could result in a diminished focus on non-traditional activities, often requiring stringent protocols and a strong emphasis on financial efficiency. Thirdly, increasing diversity on the board may lead to conflicts among members, especially when different viewpoints and management styles are present. These conflicts can impact decision-making and hinder the implementation of non-traditional activities.

Table 8
GMM regression results in the case of dummy variables

Variable	GLS	GMM	GMM (FCEO)	GMM (BP – SOB)
ROE	0.0232**	0.0808*	–0.121*	–0.117***
	[2.56]	[1.92]	[–1.89]	[–3.42]
ROA	0.131	–0.269	2.258***	1.403***
	[1.22]	[–0.50]	[2.99]	[3.19]
NIM	–0.0514***	–0.193***	–0.160***	0.109
	[–4.36]	[–2.71]	[–3.73]	[1.55]
ETA	0.0645***	0.305***	–0.157	–0.139**
	[3.90]	[4.61]	[–1.48]	[–2.30]
DOL	–0.0117	–0.162	0.282*	0.12
	[–0.33]	[–1.02]	[1.77]	[1.21]

(*Continued on next page*)

Table 8 (*Continued*)

Variable	GLS	GMM	GMM	GMM (BP – SOB)
CAR	0.0152*	–0.0471	–0.0538*	0.0267**
	[1.72]	[–1.47]	[–1.65]	[2.31]
NPL	–0.00212	–0.00543***	–0.00276	–0.264***
	[–0.83]	[–2.82]	[–0.35]	[–3.10]
LDR	0.00216	0.0159***	0.00195	0.00706*
	[1.38]	[2.77]	[0.36]	[1.87]
SIZE	0.000251***	0.000395***	0.000111*	–0.0000117
	[2.81]	[4.07]	[1.75]	[–0.14]
GDP	–0.0116	–0.0512**	0.0543**	0.0148
	[–0.50]	[–2.14]	[2.34]	[0.71]
INF	–0.0183**	–0.135*	0.104**	0.0409
	[–2.37]	[–1.88]	[2.15]	[0.48]
L.NII		–0.745**	–0.0454	0.225
		[–2.08]	[–0.22]	[1.62]
FCEO			–0.00506**	
			[2.01]	
PB				0.00528***
				[3.45]
SOB				0.00300*
				[1.86]
_cons	–0.00535*	–0.00808	0.0200*	–0.00147
	[-1.79]	[–0.78]	[1.86]	[–0.33]
N	276	253	230	138
Arellano-Bond test for AR(2)		z = –0.48 Pr > z = 0.628	z = –1.94 Pr > z = 0.052	z = –0.43 Pr > z = 0.667
Sargan test		0.556	0.953	0.721
Hansen test		0.368	0.678	0.670

Notes: ROE, ROA and NIM represent the efficiency of the bank's operations; ETA represents the degree of the firm's dependence on equity capital to finance its business activities and measures the firm's ability to repay debt and sustain long-term growth; DOL is the financial leverage of the bank; CAR represents the bank's capital adequacy ratio as stipulated by Basel regulations; NPL is the non-performing loan ratio; LDR is the loan-to-deposit ratio; SIZE is the bank's scale (logarithm of assets); GDP and INF are macroeconomic variables representing economic growth and inflation, respectively; The dummy variable for gender (FCEO) (1 if there is a female member on the board of directors and 0 otherwise), region (PB) (1 if the bank belongs to private ownership and 0 otherwise), and foreign ownership (SOB) (1 if there is foreign investment and 0 otherwise).***, ** and * indicate statistical significance levels of 1%, 5% and 10%, respectively. (Source: Authors summarise from regression results by Stata soft ware).

Furthermore, in the event of disagreement among board members regarding resource allocation and investment strategies, there is a potential reduction in investments allocated towards non-traditional activities. The study results showed that when there is a female presence on the board of directors, a one-unit increase in ROE leads to a decrease of 0.121 units in NII at a significance level of 10%.

The possibility for the bank to create non-traditional activities, such as new goods and services, grows if ROA rises, a sign that the bank is making more money than its assets. These goods and services can bring in more clients while enhancing the experiences of current ones, boosting sales and profitability for the bank. Increases in ROA also indicate that the bank is using its operational capital and assets more effectively. By doing this, the bank can increase the capital available for lending and investing, generating non-interest income. To improve the bank's operational effectiveness and profitability, the board of directors may be more cautious and make more responsible financial decisions if there is a gender diversity element. As shown by the outcomes in Table 8, the rise in ROA has made a sizable contribution to the bank's non-interest revenue. The outcomes also show that the bank can increase productivity and efficiency when it employs operating leverage by utilising more sophisticated technologies or optimising business procedures. Input costs can be decreased, output can be improved, and services can be delivered more quickly and effectively. This contributes to promoting non-traditional activities. When CAR increases, the bank has better financial protection and is more capable of dealing with higher financial risks. However, this can also affect the bank's operations and its income. When CAR increases, the bank must reduce non-traditional activities, such as investing in more complex financial products, to ensure that CAR remains safe. This reduction in activities will decrease the bank's income from those activities. However, the results indicate the insignificant impact of CAR on NII in the case of gender diversity in the board of directors.

The influence of banking factors in the private sector and foreign capital investment

Similarly to the case of having female members on the board of directors, the ROE is also influenced by the shift from positive to negative and has a significant impact. The interest-independent profit (NII) will fall by 0.117 units for every unit decrease in ROE. This demonstrates the significance of ROE in evaluating the bank's financial performance and potential for profitability. Additionally, private banking with foreign capital involvement supports the development of unconventional businesses and the production of income that is not influenced by interest rates. Private banks are frequently recognised and run in a

competitive, free-market environment that supports their development instead of state-owned or locally controlled banks and expands business ventures to serve customers better.

In contrast, state-owned banks operate in a more tightly regulated environment with more barriers, restrictions on regulations, loan conditions and interest rates. Additionally, state-owned banks frequently concentrate on larger, more organised industries, whereas private banks frequently concentrate on small- and medium-sized business sectors. This helps private banks quickly adapt to the local market and develop products and services that meet customer needs. Additionally, private banks frequently have greater latitude in risk management and financial efficiency optimisation, facilitating better market adjustment and profit maximisation.

In general, when considering the impact of private sector banks and foreign factors, the influence of ROA and NPL on NII is significant. Meanwhile, other factors have an effect but are not necessary except for scale, and macroeconomic factors are not enough to conclude the impact without considering additional factors such as the private sector and the presence of foreign investors in the bank.

To ensure the robustness of the findings, the authors conducted various tests, such as the Arellano-Bond test, Hansen test and Sargan test (see Table 8), which all yielded appropriate results. The model is not subject to endogeneity issues and can address endogenous and exogenous factors.

CONCLUSION

The study aimed to examine the factors that influence the non-traditional activities of listed commercial banks in Vietnam and their levels of impact. In addition, the authors also considered the role of gender diversity on the board of directors, the private sector, and foreign investment in bringing about significant changes in the influence of these factors. Overall, the ROE, the ratio of equity to assets, the ratio of loans to deposits and scale contributed to the increase in banks' non-traditional activities, creating opportunities for non-interest income. Conversely, the NIM, the ratio of NPLs to total loans and macroeconomic factors reduced investment in non-traditional activities. The ratio of equity to assets was found to have a significant impact.

Moreover, the presence of female members on the board of directors caused a significant change, specifically shifting the impact of ROE from positive to negative. Meanwhile, macroeconomic factors have turned from a negative

to a positive effect on banks' non-traditional activities. In this study, ROA and business traps also influenced non-interest income. The results showed that women impacted some banks' decisions regarding increasing non-traditional activities. Essentially, women tend to make cautious decisions with a high degree of safety, thus prioritising traditional activities instead of expanding investment into non-traditional activities to diversify income. Similarly, when examining the factors of the private sector and foreign investment, it was found that there was an increase in non-traditional activities of banks in the private sector or those with foreign investment to maximise profit and avoid risks from lending activities. They had more opportunities to formulate policies that favoured the non-traditional activities of banks.

This research has two significant consequences. First, the results shed light on the key determinants influencing the non-traditional activities of listed commercial banks in Vietnam while providing valuable information for policymakers, banking regulators, and industry practitioners. Understanding these factors can help develop effective strategies to encourage income diversification and enhance the overall certainty of the banking industry. Second, the study highlights the importance of gender diversity, private participation and foreign investment in shaping the dynamics of non-traditional banking activities. For example, having female members on boards of directors has been shown to influence decisions, especially regarding expansion into non-traditional activities. Correspondingly, the participation of private entities and foreign investors has contributed to the rising trend of non-traditional activities in banks, led by the goals of profit maximisation and strategic risk reduction.

However, this study still has some limitations. Firstly, it must be recognised that several other factors can influence a bank's non-traditional operations, including the number of branches, education level and age of the CEO, as well as the bank's reputation. However, these factors have not been considered in the current analysis. Secondly, the impact of Basel II and III regulations on non-traditional activities has not been thoroughly researched. Thirdly, this study has not considered aggregation at the bank level because banks may have many more significant shareholders, creating a correlation within banks. Finally, it is worth noting that the scope of this study is limited to the Vietnamese context. Therefore, its findings and conclusions may not be readily applicable or generalisable to other developing countries. According to the authors, these limitations could be exciting ideas for future research.

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