INCOME DIVERSIFICATION AND PROFITABILITY OF VIETNAMESE COMMERCIAL BANKS

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Abstract - The paper aims to investigate the impact of income diversification on commercial banks' profitability in Vietnam. Using a panel data set of 33 Vietnamese commercial banks during the period from 2006 to 2020, the empirical analysis shows the more diverse in revenue sources, the higher banks' financial performance. The research provides some recommendations that banks should look forward to diversifying their income, particularly income from non-traditional activities, in order to improve competitiveness, reduce risk, and raise profitability and policies that encourage banks to diversify their incomes should be enacted. This will not only be beneficial for banks but also helps to mitigate the risk for banking industry and maintain its stability. The main results are robust to a different measure of financial performance and controlling for the period of economic crisis.

Key words - Income diversification; financial performance; commercial banks; Herfindahl Hirschman index; non-interest income

1. Introduction

Nowadays, the operations of Vietnamese commercial banks are plentiful and diversified. Commercial banks are facing an increasingly competitive business climate. Therefore, the development of new operations besides the traditional borrowing and lending activities are necessary in order to increase profits. Typical non-interest income sources include trust activities, service fees on deposit accounts, service fees and insurance commissions, investment income, credit fees, securities trading, profit on loan and rental trading accounts… Especially, due to the impact of Covid-19 pandemic on the traditional banking activities, the new trend of obtaining revenues from non-interest activities is getting more and more traction.

This study aims to investigate the impact of the bank's income diversification on bank financial performance. In term of diversification, previous studies define this concept as following. [1] have observed that when the interests of the studies are different, the term "diversification" will have different meanings. [2] define diversification as an activity that is functionally realized by combining into a corporation, such as securities trading activities, insurance, and other financial services. On the other hand, [3] assert that diversification is the formation of a consortium of multiple banks through a bank's parent company or banking groups. In this study, diversification refers to non-traditional banking activities. Traditional operations are those that focus on bank interest income. Therefore, diversification is the bank's focus on activities to increase non-interest income.

In terms of the relationship between banks' income diversification and their financial performance, previous literature yields mixed findings. According to [4], non-interest income is becoming increasingly important, accounting for 40% of operating income in the US commercial banking industry. A study by [5] argue that in order to survive and succeed in generating revenue and profits, banks are becoming increasingly reliant on non-interest revenue. On the one hand, some studies ([6], [7], [8], [9], [10], [11] and [12]) find that diversification is beneficial to banks because they can take advantage of economies of scope. Diversification, on the other hand, has been shown in certain studies to have a negative impact on bank profitability. It results from the lack of bank management experience ([13] and [14]) when banks expand their activities to non-traditional sectors. These studies are done primarily in the United States and developed countries. The number of researches on this issue in emerging economies is limited, especially, fewer studies have been conducted specifically for commercial banks in Vietnam.

A variety of hypotheses are put forward regarding to the influence of revenue diversification on bank profitability. Some theories suggest that banks should diversify their income so that it can bring many benefits. Others believe that banks should only focus on traditional activities and limit diversification. In addition, some studies do not advocate income diversification or specialization. They believe that diversification depends on the environment and conditions of each bank. Therefore, research on the influence of income diversity on bank profitability in Vietnam is required. A comprehensive understanding of the impact of diversification on profitability is critical to a bank's success, especially, in an increasingly competitive business environment. Moreover, knowing this relationship also helps the policymakers to formulate directional policies for developing and maintaining the banking system's stability.

Using a data set that includes 33 Vietnamese commercial banks from 2006 to 2020, our analysis results show that a stronger income diversification results in higher banks' financial performance. The main results are still valid when using a different measure of financial performance, namely ROE, and controlling for the period of economic crisis.

2. Hypothesis development and literature review

2.1. Hypothesis development

This study assesses whether income diversification benefits commercial banks in Vietnam. The research motivation is driven by the "not putting all your eggs in one basket". This theory suggests that instead of focusing only

on developing traditional lending activities, banks should expand their services and diversify their revenue sources to achieve high efficiency. [15] and [16] mention this theory in their research. [15] suggest that a combination of different banking activities can lead to increased returns and diversification of risks. In addition, [16] study of 266 listed banks in 11 countries finds that diversification can add value to banks.

Another theory that explains the effect of diversification on commercial bank performance is the resource-based theory developed by [17], [18] and [19]. The theory suggests that firms can achieve higher performance if they can exploit the potential synergies between resources. This helps banks being able to share functions, resources and competencies, hence they can reduce cost and improve financial performance [20].

Some studies suggest that banks can enjoy an increasing return to scale by diversifying their revenues. According to [21], banks can collect information on clients who have used one service in order to make other financial services more accessible. Following that, [22] also finds similar results when he suggested that banks would rely on customer information to provide guarantees, insurance, and securities services. So, if the bank engages in more and more different activities, they may achieve better operational efficiency.

From the above discussion, the following research hypothesis is proposed:

H1: Income diversification improves commercial bank performance.

2.2. Literature review

Many studies have investigated the impact of income diversification on bank financial performance. However, there is no consensus conclusion regarding to this topic.

A number of studies find that revenue diversity helps banks reducing risk of bankruptcy and other risks, such as [2], [4], [23], [24], [25], [26], [27], [28], [29], [30] and [31]. At the international level, the research by [28] uses commercial bank statistics from 29 nations in Asia in a period of 15 years from 1995 to 2009 also finds the positive impacts of non-interest income on bank systems. Similarly, research by [33] also suggests that banks can share inputs in joint production or cross-selling, which will help banks take advantage of the diversification of sources of bank earnings through economies of scale.

On the opposite direction, some studies report that although income diversifying improves efficiency but it simultaneously increases the risk for the bank, resulting in a decrease in profitability. [34] suggested that the decrease in bank profitability and the rise in risk are related to the increase in non-interest income. Similarly, [35] analyze bank income structure and risk by using data from 723 European banks over the period 1996–2002. They find that non-credit income can reduce bank performance by increasing profitability and also increase the risk for banks. [36] used data from the Indonesian banking sector and show that income diversification increases the risk of large-sized banks. Similarly, subsequent literature finds that an expansion of non-interest income may harm banks' profitability, see [37], [38], [39], [40] and [41].

In Vietnam, a few studies have been carried to investigate the impact of income diversification on banks' performance, for example, [42], [43] and [44]. All of these studies find a positive effect of diversification on banks' profitability. This study contributes to the current literature by using a larger and updated data set as well as using multiple income diversification proxies in order to investigate the impact of income diversification on commercial banks' profitability.

3. Research methodology

3.1. Data

This paper employs a data set includes 33 commercial banks in Vietnam from 2006 and 2020. The variables using in this paper and their descriptions are listed in Table 1.

Table 1. *List of variables*

Variables	Defining Variables
ROA	Return On Asset (%) is measured by Net Income divided by Total Assets.
ROE	Return On Equity (%) is measured by Net Income divided by Shareholder Equity.
HHI	Herfindahl Hirschman index, measure by $HHI = 1 - \left[\left(\frac{non - interest\ income}{total\ bank's\ icome}\right)^2 + \left(\frac{net\ interest\ income}{total\ bank's\ income}\right)^2\right]$
GNII	Non-interest income growth of the bank (%).
NNII	Net non-interest income (%), calculated by the proportion of non-credit net income to the total net operational income of each bank.
NII	Non-interest income to interest income (%) as a percentage of bank's interest income.
EQUITY	The equity-to-asset ratio (%) is the amount of equity the bank has when compared to the total assets owned by the bank.
NPL	The non-performing loans to loans ratio (%)
SIZE	The natural logarithm of banks' total assets
GDPS	The size of the domestic market measured by the natural logarithm of Gross domestic product.
INF	Annual inflation rates (%)

The data of banks' specific characteristics includes the dependent variables, ROA and ROE, four income diversification proxies, HHI, GNII, NNII and NII, and the control variables, including EQUITY, NPL and SIZE are collected from FIINPRO. The second set of data is macroeconomic variables, including GDPS and INF, are also taken from World Bank Data. Only observations that have data for all variables are included in our data set. The final data set includes a total of 456 bank-year observations.

3.2. Regression model

Following the previous literature (see [2] and [34]), we employ a multivariate regression model as followed:

$$Profitability_{i,t} = \alpha + \beta Diversification_{i,t} + \gamma Control_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where, i and t are individual bank index and year index, respectively. The dependent variable is bank profitability ratio proxied by return on assets ratio (ROA) which is widely used in previous literature (see [45] and [46]). In the robustness test section, an alternative proxy of bank profitability, namely return on equity (ROE), is used. Our mail variable of interest is Diversification represents the level of income diversification of commercial banks. In this paper, we use four variables to proxy for bank income diversification, namely Herfindahl Hirschman index (HHI), non-interest income growth (GNII), net non-interest income (NNII) and non-interest income to interest income ratio (NII). Our regression model is also controlled for bank specific characteristics and macroeconomic variables, including equity to total assets, non-performance loan, bank size, the size of the domestic market and inflation rate. Moreover, the empirical results are also controlled for bank fixed effect. The robust standard errors are also used to correct for the potential heteroscedasticity.

4. Results and discussions

4.1. Descriptive statistics and correlation test

The summary statistics of the variables are shown in Table 2. From the result shows that traditional banking remains the primary source of income for banks in the Vietnamese market, as evidenced by an average non-interest income ratio (the proportion of net income from non-credit activities compared to the total net.

Table 2. *Descriptive Statistics Results*

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	456	0.011	0.008	-0.004	0.06
ROE	456	0.106	0.075	-0.046	0.445
HHI	456	0.3	0.129	0	0.5
GNII	456	0.905	5.317	-25.923	74.275
NNII	456	0.202	0.176	-0.945	0.989
NII	455	0.555	4.166	-0.486	86.83
EQUITY	456	0.107	0.066	0.027	9.463
NPL	456	0.017	0.016	0	0.114
SIZE	456	31.921	1.402	27.441	34.955
GDPS	456	25.791	0.408	24.919	26.326
INF	456	0.072	0.059	0.006	0.231

Over the sample period, return on assets (ROA) of commercial banks in Vietnam ranges from the minimum value of -0.4% to the maximum value of 6% and the average value of 1.1%. The return on equity (ROE) ranges from a minimum value of -4.6% to a maximum value of 44.5% and a mean equal to 10.6%.

In terms of the income diversification proxies, we observe a significant variance across different banks and years in our sample period. The HHI variable ranges between the minimum value of 0 to a maximum value of 0.5 and has a mean equal to 0.3. In addition, the standard deviation of the HHI is 0.129.

Table 3. *Correlation Matrix*

Variables	*HHI*	*GNII*	*NNII*	*NII*	*EQUITY*	*NPL*	*SIZE*	*GDPS*	*INF*
HHI	1.000								
GNII	0.048	1.000							
NNII	0.634	0.032	1.000						
NII	-0.065	0.010	0.330	1.000					
EQUITY	0.014	0.044	-0.068	-0.008	1.000				
NPL	-0.060	0.026	0.016	-0.003	-0.112	1.000			
SIZE	0.134	-0.095	0.142	0.000	-0.696	0.132	1.000		
GDPS	-0.013	-0.093	0.017	-0.056	-0.353	0.159	0.553	1.000	
INF	-0.090	0.046	-0.091	0.011	0.292	-0.029	-0.320	-0.575	1.000

Table 3 presents the pairs of correlation coefficients between variables. We can see that there is no pair of independent variables has the correlation coefficient that is higher than 0.8, so there is no serious multicollinearity problem in our regression results.

4.2. Regression results

Table 4 reports the panel regression results for (1) where the return of asset ratio ROA is regressed against diversification variables, namely HHI, GNII, NNII, and NII respectively. We report some noteworthy results. First, all independent variables (HHI, GNII, NNII, and NII) are found to have statistically significant effects on ROA. Secondly, all of these coefficients are positive. It means that the higher the value of HHI, GNII, and NNII variables are, i.e. higher degree of diversification toward non-interest income, the greater the return on assets of the banks is. In detail, HHI has a coefficient value of 0.0060, GNII has a coefficient value of 0.0002, NNII has a coefficient value of 0.0056 and NII has a coefficient value of 0.00000882. The results imply that banks that focus on income diversification will achieve higher returns than banks that practice a lower degree of income diversification or focus only on traditional activities, i.e. interest income related activities.

In terms of control variables expressing bank specific characteristics, the results show that EQUITY, SIZE have statistically significant effect on ROA at least 5% level across four regression models. An increase in bank size is associated with an increase in bank profitability. These results are similar to that of [45] and [47]. When considering macroeconomic variables, the size of the domestic market (GDPS) is statistically significant in all four models at 5% confident level. the relationship with the ROA dependent variable. However, the direction of impact

is the opposite of the performance of Vietnamese banks. The coefficients range from -0.0188 to -0.0185 and are significant at the 5% level. Moreover, the value of adjusted R^2 is ranging from 62.8% to 64.4%. These results infer the appropriateness of the control variables using in our regression model.

Table 4. *Fixed effects model (FEM) regressions of the impacts of HHI, GNII, NNII and NII on ROA*

	(1)	(2)	(3)	(4)
Variables	*ROA*	*ROA*	*ROA*	*ROA*
HHI	0.0121***			
	[3.8936]			
GNII		0.0002***		
		[3.4857]		
NNII			0.0091***	
			[3.7859]	
NII				0. 00001***
				[4.8712]
EQUITY	0.0795***	0.0848***	0.0823***	0.0806***
	[7.4463]	[6.9512]	[7.2223]	[7.2654]
NPL	-0.0465**	-0.0500***	-0.0505***	-0.0460**
	[-2.4601]	[-2.8944]	[-2.8649]	[-2.5443]
SIZE	0.0082***	0.0080***	0.0077***	0.0079***
	[6.4294]	[6.3464]	[6.4094]	[6.5978]
GDP	-0.0176***	-0.0174***	-0.0169***	-0.0171***
	[-7.5749]	[-7.4173]	[-7.7672]	[-7.9472]
INF	0.0075	-0.0001	0.0036	0.0054
	[1.0527]	[-0.0187]	[0.5799]	[0.8699]
Constant	0.1913***	0.1937***	0.1901***	0.1884***
	[6.8091]	[6.7060]	[7.0008]	[7.0935]
Observations	423	456	456	456
Adjusted R^2	0.596	0.559	0.572	0.581

****, **, and * denotes the significant level at 1%, 5%, and 10% respectively.*

4.3. Robustness tests

To consolidate the results from the main regression model, some robustness tests are implemented. First, an alternative measure of bank profitability is used, namely return on equity (ROE). Second, we control our regressions for the period of crisis from 2007 to 2009 to see whether the impact of income diversification on banks' profitability remains significant.

4.3.1. Using ROE

Previous studies by [6] and [24] also use ROE to measure the bank's performance. Therefore, in the first robustness test we replace return on asset ratio by return on equity ROE as the proxy for banks' profitability in equation (1). Besides ROA, ROE is well-known as a measure for profitability performance not only in banking industry but also in other businesses.

The results of the first robustness test are reported in Table 5. It is noticed that when using an alternative measurement, the results are largely consistent with the main ones. In particular, three out of four proxies for income diversification are found to have statically significant impacts on banks' profitability, except HHI. Moreover, all coefficients are positive. In detail, the GNII has a coefficient value of 0.0006 and it is significant at the 5% level, NNII has a coefficient value of 0.0265 and is significant at the 10% level and NII has a coefficient value of 0.0000441 and is significant at the 10% level. It means non-interest income increases returns to shareholders. These results, again, support our research hypothesis that a higher income diversification degree help banks to improve their financial performance. In terms of the control variables, EQUITY, SIZE and GDPS are statistically significant in our four models reported in Table 4-4. In addition, the adjusted R^2 has values between 64.0% to 65.2%.

Table 5. *Robustness test: Fixed effects model (FEM) regressions of the impacts of HHI, GNII, NNII and NII on ROE*

	(1)	(2)	(3)	(4)
Variables	*ROE*	*ROE*	*ROE*	*ROE*
HHI	0.1013***			
	[3.9752]			
GNII		0.0010***		
		[3.1149]		
NNII			0.0615***	
			[3.1822]	
NII				0.0001***
				[4.6116]
EQUITY	0.0906	0.1306**	0.1144*	0.0990
	[1.3778]	[1.9884]	[1.8131]	[1.6011]
NPL	-0.4190**	-0.4704***	-0.4798***	-0.4480**
	[-2.1716]	[-2.6612]	[-2.7071]	[-2.4831]
SIZE	0.0747***	0.0712***	0.0692***	0.0703***
	[7.5001]	[7.4998]	[7.4435]	[7.5124]
GDP	-0.1599***	-0.1554***	-0.1519***	-0.1529***
	[-8.2190]	[-8.0903]	[-8.2639]	[-8.3713]
INF	0.1134*	0.0478	0.0738	0.0911*
	[1.9153]	[0.9282]	[1.4214]	[1.7849]
Constant	1.8051***	1.8318***	1.7925***	1.7692***
	[6.9899]	[7.0540]	[7.1663]	[7.2155]
Observations	423	456	456	456
Adjusted R^2	0.567	0.538	0.550	0.561

*Note ***, **, and * denotes the significant level at 1%, 5%, and 10% respectively.*

Similar to the results with the ROA dependent variable, the model shows a significant negative effect of market size on bank profitability. The larger the market size, the smaller the return on equity, which adversely affects the bank's performance.

4.3.2. Controlling for economic crisis

To further strengthen the main results, following [25], the study continues to test whether the relationship between income diversification and banks' profitability is held when controlling for the economic crisis. Particularly, a dummy variable of CRISIS and its interaction with diversification variables are added into (1). CRISIS has a value of 1 for the year of 2007, 2008 and 2009 and 0 otherwise.

Table 6. *Robustness test: FEM regressions of the impacts of HHI, GNII, NNII and NII on ROA.*

Variables	(1) *ROA*	(2) *ROA*	(3) *ROA*	(4) *ROA*
HHI	0.0120***			
	[3.4001]			
GNII		0.0001**		
		[2.0624]		
NNII			0.0070**	
			[2.3397]	
NII				0. 000013***
				[3.7424]
CRISIS	0.0029	0.0017*	0.0002	0.0003
	[1.1731]	[1.7148]	[0.1934]	[0.1815]
HHI CRISIS*	-0.0037			
	[-0.5063]			
GNII CRISIS*		0.0001		
		[0.6342]		
NNII CRISIS*			0.0050	
			[1.1742]	
NII CRISIS*				0.0000
				[0.5064]
EQUITY	0.0802***	0.0853***	0.0837***	0.0814***
	[7.6404]	[7.0573]	[7.5083]	[7.4530]
NPL	-0.0403**	-0.0428**	-0.0447**	-0.0422**
	[-2.1554]	[-2.4508]	[-2.5422]	[-2.3583]
SIZE	0.0083***	0.0081***	0.0078***	0.0079***
	[6.4899]	[6.4163]	[6.3950]	[6.5137]
GDP	-0.0171***	-0.0168***	-0.0162***	-0.0166***
	[-6.8489]	[-6.9091]	[-6.8456]	[-7.0320]
INF	0.0054	-0.0020	0.0029	0.0042
	[0.7632]	[-0.3212]	[0.4701]	[0.6927]
Constant	0.1723***	0.1748***	0.1699***	0.1738***
	[5.0905]	[5.1990]	[5.1315]	[5.3584]
Observations	423	456	456	456
Adjusted R^2	0.598	0.561	0.575	0.581

*Note ***, **, and * denotes the significant level at 1%, 5%, and 10% respectively*

The results of the robustness test are presented in Tables 6. In summary, the conclusion about the effect of income diversification on banks' profitability are not changed when controlling for the effect of economic crisis. HHI, GNII, and NII have all been shown to have a statistically significant positive effect on ROA. It means that banks with a high degree of diversification enjoyed higher returns and achieved better performance.

5. Conclusion

The study examines the influence income diversification, proxied by HHI, GNII, NNII and NII, on commercial banks' profitability. The research employs a panel data set of 33 Vietnamese commercial banks from 2006 to 2020. The analysis shows that a higher degree of income diversification is beneficial to banks and results in higher banks' financial performance. Our main results are held when using a different measure of financial performance, namely ROE, and controlling for the period of economic crisis.

These results suggest that banks should look forward to diversifying their revenue streams, particularly income from non-traditional activities, in order to improve competitiveness, reduce risk, and raise profitability. In particular, banks should exploit the current technology development in providing products and services. In order to ensure the effectiveness of the diversification, a research department dedicated to product development should also be established. In addition, commercial banks need to diversify their products and improve the added values by increasing the ability to synergize between products and services in order to maximize benefits for customers.

At the macroeconomic level, policymakers also should implement some policies in order to encourage banks to diversify their incomes. This will not only be beneficial for banks but also helps to mitigate the risk for banking industry and maintain its stability.

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