

DOES DIVERSIFICATION AFFECT LOAN GROWTH? EVIDENCE FROM THE VIETNAMESE BANKING SECTOR

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ABSTRACT

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This study employs a sample of Vietnamese commercial banks from 2008 to 2019 to evaluate whether diversification influences the growth of banks' gross loans as well as the growth of individual loan categories. Geographic diversification is likely to reduce the amount of money available for loans, however over time it may lead to loan growth via new customer relationships. Deposit diversification is likely to increase total funding available for loans. Our findings show that geographic diversification is statistically significant with the expansion of gross loans, consumer loans and corporate loans. In contrast, the empirical results provide evidence of the impact of deposit diversification on the growth of consumer loans only. In the case of other loans, the results do not reveal any significant diversification impact on growth. To an emerging country with loan domination of the banking system, the strategic implications of our findings could be beneficial for both bank managers and regulators.

1. INTRODUCTION

Motivated by the ongoing debate about the impact of diversification on bank operations, this paper evaluates whether diversification is beneficial for banks in an emerging economy. Moreover, the empirical analysis aims to investigate how deposit diversification and geographic diversification influence loan growth in the banking sector by using data on Vietnamese commercial banks during the 2008 – 2019 period.

With financial deregulation and increased competition, commercial banks have an incentive to expand their activities and develop new lines of businesses alongside their

traditional interest earning activities. Vietnamese commercial banks have begun to engage in more non-interest generating activities such as cash ATM withdrawal charges and letters of credit. However, their operations have mostly relied on traditional intermediation activities (deposits funding loans). Thus, loan dominance in banking activities directly affects the performance and risk of these banks. Income from loans continues to be the main component of revenue for Vietnamese commercial banks. In addition, the marginal cost induced by the supply of additional loans is limited to interest expenses when a lending relationship is established (Lepetit et al., 2008). As a result, the banks' strategies involve solutions that aim to improve their share of lending in this competitive market.

To eliminate a firm's idiosyncratic risk or enhance its performance, managers are likely to diversify by offering new products (such as deposits and fee-generating activities) or enter into new geographic markets (Baele et al., 2007; Meslier et al., 2016). As a response to the diversification trend, the Vietnamese banking system has experienced a dramatic increase in both bank services and number of branches. Moreover, the changes have had a dramatic influence on lending activity. Nevertheless, there have been many obstacles for Vietnamese commercial banks to launch new products or expand their network. Firstly, the national economy is heavily dependent on agriculture; therefore, a significant number of customers are in the habit of storing and paying in cash. Additionally, technology has neither been widely adopted by industries nor is it available in every region. In other words, there is still a lack of infrastructure and facilities. Consequently, these barriers prevent banks from offering a range of new products or opening more branches. Thus, it has been challenging for Vietnamese commercial banks to diversify.

There is an extensive literature that questions the implications of diversification on banks in terms of either risk or performance. A vast range of studies contributes to the diversification literature, but there is less discussion about how diversification affects loan or lending growth. To the best of our knowledge, no empirical study has documented the influence of diversification on loan growth in emerging economies such as Vietnam. This paper, hence, aims to contribute to the literature in the following ways. First, it fills a gap in the literature by exploring diversification benefits for lending activity in the banking system using a dataset originating from the banking industry in an emerging country. Second, the analysis not only focuses attention on how diversification relates to the growth of banks' overall loan portfolios but also compares the different effects of diversification across individual loan categories.

The rest of this study is organized as follows. Section 2 presents an overview of the existing literature. Section 3 defines the variables, describes the data sample and presents the methodology that we employ in our analysis. Section 4 details the main results of the analysis. Section 5 includes several robustness tests and finally, Section 6 concludes.

2. LITERATURE REVIEW

Empirical studies in the literature that investigate the role of diversification in the banking sector, mainly focus on the influence upon bank risk and return. The bank diversification literature consists of the following three strands: portfolio diversification, product-market diversification, and geographic diversification.

Firstly, a bank could benefit from diversifying its investment portfolio (e.g. Amihud and Lev, 1981; Lewellen, 1971; Markowitz, 1952). In the pioneering study of Markowitz (1952), focuses on diversification in securities portfolios for a financial institution. Applying the Markowitz optimal portfolio theory to combining enterprises, Lewellen (1971), and Amihud and Lev (1981) find that the multiple lines of business could enable a bank to reduce risk as long as there is no perfect correlation in the prospective profitability. Additionally, the previous studies of Levy and Sarnat (1970) and Grubel (1968) extend the literature to international portfolio diversification. Their findings suggest that international diversification for securities portfolios might result in risk reduction. Related to work on the portfolio approach to banking, Buch et al. (2010) investigates banks' cross border asset positions. They employ the data of banks located in five developed countries: France, Germany, Italy, the UK and the US. A mean–variance portfolio model is applied to estimate the benefits of international diversification in the banking sector of these major economies. The results indicate that banks are likely to improve their risk–return trade offs considerably by holding more international assets.

In reaction to declining market share of loans and deposits, banks have tended to diversify into fee-based services. A variety of products can influence the valuation of a financial institution considerably through return and risk. The second strand of literature, therefore, draws attention to product-market diversification. For example, Deyoung and Roland (2001) assess the influence of product mix on earning volatility at 472 large and medium sized commercial banks in the US from 1988 to 1995. They find that an increase in the share of fee-based activities is associated with the higher profitability volatility. The benefits of mixed banking activities is explored in Stiroh (2004b). Using the Herfindahl Hirschman Index (HHI) to proxy diversification, the empirical analysis provides evidence of a negative link between non-interest-income generating activities and risk-adjusted performance. This result is consistent with the findings of Stiroh (2004a) that the greater reliance on non-interest income, the lower risk-adjusted profits. Similarly, Stiroh and Rumble (2006) investigate whether shifting toward activities that generate fees, trading revenue, and other non-interest income could improve the performance of US financial holding companies. The findings reveal the existence of diversification benefits between Financial Holding Companies; however, the increased exposure to non-interest activities outweighs the diversification benefits.

Also, the issue of focus versus product diversification receives a considerable amount of attention in the literature with contradicting results. Acharya et al. (2006), for instance, addresses this problem by using a sample of 105 Italian banks during the period 1993 to 1999. They suggest that the impacts of loan diversification are different between high-risk banks and low-risk banks. This finding suggests that a bank's risk-taking level, therefore, could determine the effects of diversification. Thus, diversification in lending leads to decreased bank returns and produces riskier loans for high-risk banks. However, for low-risk banks, the trade-off between risk and return generated by loan diversification is inefficient. Following Hayden et al. (2007), an empirical analysis is carried out to support the argument developed by Acharya et al. (2006). To do so, they apply a Value at Risk approach and employ a dataset of the individual bank loan portfolios of 983 German banks. A negative link between diversification and returns is found for almost all German banks, and especially for the low- and moderate-risk banks. It contradicts the conclusion of Acharya et al. (2006), thus, the effect of diversification on returns seems to differ among European countries. In addition, based on a dataset of European banks for the period 1996–2002, Lepetit et al. (2008) shed new light on the association between bank risk and product diversification in the changing structure of the European banking industry. According to their conclusion, the level of risk to banks expanding into non-interest income activities is higher than to banks mainly specializing in loans. Remarkably, this link is the strongest for small banks and for those involved with fee activities.

Focusing on an emerging market such as China, Berger et al. (2010) document the effects of strategic diversification on performance by capturing product diversification in the following dimensions: loans, deposits and assets. A sample of 88 Chinese banks accounting for 90% of commercial banking assets from 1996–2006 is used in their empirical analysis. They find diversification is associated with a decline in a bank's profit and an increase in costs. The findings are consistent regardless of alternative proxies of diversification and performance. A recent study of Meslier et al. (2014) highlights the effects of revenue diversification on the performance in the Philippines. Interestingly, their results are the converse of the aforementioned studies on Western economies. That is, an increase in non-interest income can enable banks to improve their profitability. However, the diversification effect is more beneficial for foreign banks rather than their domestic counterparts.

Apart from the product diversification strategy, there is a growing body of literature that examines the influence of geographic diversification during recent decades and report mixed results. First, Berger and Deyoung (2001) examine how geographic expansion affects bank efficiency in the U.S. from 1993 to 1998. Their findings notify that the impacts of geographic scope on bank efficiency vary from bank to bank. For example, banks with

branches that expanded into nearby states and regions are likely to enhance performance. By contrast, banks' affiliates located further away from parent organizations tend to reduce their efficiency. An increase in the parent-affiliate distance diminishes the efficiency of the affiliates. According to Berger et al. (2010), after controlling for risks, geographic diversification reduces a bank's profit and increases its costs. Meanwhile, the findings of Meslier et al. (2016) conclude that the impacts of geographic diversification depend on bank size. Small banks benefit from geographic expansion in terms of both risk-adjusted returns and default risk. For large institutions, diversified geography only reduces default risk.

The advantages of geographic diversification are evidenced by other studies. To bank holding companies in the US banking industry, diversified geography is associated with both firm value enhancement and risk reduction (Deng and Elyasiani, 2008). As regards international diversification, García-Herrero and Vázquez (2013) investigate the benefit a bank gains from the operations of foreign subsidiaries. The data set covers the 38 largest international banks in the G-7 (Canada, France, Germany, Italy, Japan, UK and US) plus Spain. Similar Hayden et al. (2007), find that the risk-adjusted returns are improved for a bank with a larger allocation of assets overseas. Additionally, overseas subsidiaries are more profitable but riskier. Both returns and the volatility of subsidiaries opened in emerging countries are higher than the average at home or in other industrial countries. Employing a new approach to measure international diversification in banking, Fang and Van Lelyveld (2014) emphasize the association between geographical diversification and reduced credit risk across the 49 multinational banking groups. The study of Goetz et al. (2016) assess the net impact of the geographic expansion of Bank Holding Companies deposits on their risk and loan quality. Their estimations indicate that geographic expansion significantly reduces risks but does not change the quality of bank loans. The results are in line with the argument that banks diversify their exposure to idiosyncratic local market risks, then lower risks through geographic expansion. In a recent study, Yildirim and Efthyvoulou (2018) employ the system Generalized Method of Moments (system-GMM) estimation technique to investigate the value effect of international diversification. The analysis concentrates on a large number of banks in both developed countries and emerging countries. Results suggest that the impact of international diversification on value is dependent upon a bank's home country. Furthermore, greater diversification has a significant and positive association with changes in valuation for emerging country banks, but not for developed country banks. However, there is a difference in the value changes between intra-diversification (diversification across countries within a region) and inter-regional (diversification across different regions). While higher levels of intra-diversification increase bank value, a rise in inter-diversification leads to a decrease in the valuation of emerging country banks.

3. DATA AND METHODOLOGY

3.1. Data and Variables

Regarding Vietnamese bank-specific information, financial information data is obtained from the Fitch database. In addition, other data is hand-collected from individual bank annual reports. The final sample contains 22 Vietnamese commercial banks consisting of three state-owned banks (VCB, BIDV and VIETIN Bank) and 19 privately owned banks for the years 2008- 2019. All macroeconomic data is from the World Bank World Development Indicators database. Table 1 presents definitions of all the variables included in the analysis.

Diversification measures

The study aims to examine the impacts of diversification including deposit diversification and geographic diversification on loan growth. According to Salas and Saurina (2002), a branch growth rate is employed to capture the impact of branch network expansion or geographic diversity. Opening branches in new areas or entering into a new geographic market could help banks increase loans. The influence of geographic diversification on loan growth, therefore, is expected to be positive.

To measure customer deposit diversification, a Herfindahl-Hirschman Index (HHI) is computed for all banks to account for diversification between the types of bank deposits following Berger et al. (2010).

$$HHI = \left(\frac{Current}{Total} \right)^2 + \left(\frac{Savings}{Total} \right)^2 + \left(\frac{Term}{Total} \right)^2$$

$$Total = Current + Savings + Term$$

Where Total customer deposits are captured by *Total*, *Current* is current deposits, *Savings* is savings deposits, and term deposits are denoted by *Term*. *HHI* varies between zero (a bank with customer deposits spread widely across each deposit category) and one (a bank with all customer deposits concentrated in one type of deposit). Thus, a bank will become less deposit concentrated and more diversified if the HHI decreases or we can say that a lower value of the HHI index indicates increased diversity.

Dependent variables

Growth rate of gross loans (or of consumer loans, corporate loans and other loans): The annual changes in the growth of gross loans or each loan category are used to present the dependent variables in the regressions (Kim and Sohn, 2017; Brei et al., 2013; Cull and Martínez

Table 1: Definition of variables

<i>Variables</i>	<i>Definitions</i>
<i>Dependent variables</i>	
Growth rate of gross loans _{it}	% Annual change in gross loans _{it}
Growth rate of consumer loans _{it}	% Annual change in consumer loans _{it}
Growth rate of corporate loans _{it}	% Annual change in corporate loans _{it}
Growth rate of other loans _{it}	% Annual change in other loans _{it}
<i>Main variables - Diversification measures</i>	
HHI _{it-1}	Herfindahl –Hirschman Index based on types of customers deposits _{it-1}
Bran _{it-1}	% Annual change in number of branches _{it-1}
<i>Control variables</i>	
ROA _{it-1}	$\frac{\text{Net income}_{it-1}}{\text{Total assets}_{it-1}}$
NPL _{it-1}	$\frac{\text{Non – performing loans}_{it-1}}{\text{Gross loans}_{it-1}}$
SIZE _{it-1}	$\frac{\text{Total assets}_{it-1}}{\sum_{i=1}^{22} \text{Total assets}_{it-1}}$
Capital _{it-1}	$\frac{\text{Equity}_{it-1}}{\text{Total assets}_{it-1}}$
Liquidity _{it-1}	$\frac{\text{Loans}_{it-1}}{\text{Customer deposits}_{it-1}}$
Ownership _{it-1}	equals to 1 if state-owned commercial banks equals to 0 if otherwise
GDP _{t-1}	Annual percentage growth rate of GDP _{t-1}
LIR _{t-1}	Lending interest rates _{t-1}

Source: Authors' list

Pería, 2013). In the Vietnamese banking sector, consumer loans are the loans to individuals while banks lend corporate loans to corporate and commercial enterprises. These are the main lending types and account for the majority of bank loans. Some Vietnamese commercial banks used to offer residential mortgages but this loan category has been

neither popular nor familiar to customers in Vietnam. Consequently, the growth of residential mortgages is not included in our study. Other loans include all loans not classified as either consumer or corporate loan groups.

Control variables

In order to capture the magnitude of bank-specific and macroeconomic conditions on the loan growth, several variables are used in the model.

ROA: The ratio of income after taxes (net income) to total assets is primarily considered in this study to denote banks' profitability (Cull and Martínez Pería, 2013). Banks with high profitability are likely to have strong balance sheets. Therefore, a positive relationship between profitability and bank lending is expected. By contrast, a higher profitability can imply a greater risk on assets. In this respect, banks with higher profitability might supply fewer loans to improve the quality of assets (Kim and Sohn, 2017). In this case, a relationship between profitability and bank lending can be negative.

NPL: NPL is used to measure loan quality. It is calculated by the ratio of NPL to gross loans. Thus, the higher the level of NPL, the worse the loan portfolio quality is (Kim and Sohn, 2017). The tendency of reducing loans increases when loan quality worsens. The expected sign of NPL is negative.

Capital: The ratio of equity capital to total assets is included in the analysis. Well-capitalized banks tend to increase their loans because they can more effectively absorb the negative effects of shocks on bank lending (Kim and Sohn, 2017; Francis and Osborne, 2012). Also, a rise in capital encourages risk-taking behaviour (Kim and Santomero, 1988; Koehn and Santomero, 1980). However, according to the literature (Berger et al., 1995; Keeley and Furlong, 1990), higher capital links with lower moral hazard problems and better-capitalized banks have greater monitoring incentives. Therefore, managers of these banks could have fewer incentives to lend more to decrease riskiness embedded in their loan portfolios. Consequently, capital is expected to be either positive or negative with loan growth.

Size: Bank size is calculated as the ratio of each bank's assets to total assets for all sample banks. The expected sign of this variable is ambiguous. Following the "too big to fail" hypothesis suggested by Berger and Udell (1997), large banks have incentives to take more risk, thereby enabling them to supply more credit. However, large banks can diversify their portfolio by investing in various types of securities and involving themselves in various activities, whereas small banks tend to pursue traditional lending activities. In other words, diversification and size go hand in hand (Demsetz and Strahan, 1997). In addition, small banks tend to supply relatively more lending to their clients (Brei et al., 2013). From this perspective, the effect of bank size on lending can be negative.

Liquidity: In this study, the ratio of loans to customer deposits is used to capture bank liquidity. Liquid banks are likely to supply more (Brei et al, 2013, Kishan and Opiela, 2000) or there could be a decline in bank credit production when banks hold more loans (Cornett et al., 2011; Ivashina and Scharfstein, 2010).

Ownership: The binary value is employed to denote the ownership status of banks. The types of bank ownership have impacts on bank activities, financial development and economic growth (Sapienza, 2004; La Porta et al., 2002; Barth et al., 2001). Additionally, state-owned banks (or government-owned banks) could increase their lending relatively as compared to private banks (Dinç, 2005).

Macroeconomic variables: To account for the effects of the macroeconomic condition, annual growth rates of GDP and lending interest rates are used (Abedifa et al., 2018; Kim and Sohn, 2017; Brei et al., 2013). The expected sign of the growth rate of real GDP is positive because clients require more funds to broaden business and will increase loan demand. On the other hand, in an upswing period, customers could have more income and revenues to invest instead of borrowing from banks. Alternatively, the influence of changes in bank lending interest rate is expected to be negative because an increase in market rates or a rise in prices of loans could lead to a decrease in loan demands.

3.2. Research Philosophy, Approach and Methods

A research philosophy is relevant to a set of beliefs and assumptions of the knowledge being examined in the research project, in which the philosophical assumptions justify how the research question will be answered (Saunders, Lewis and Thornhill, 2016; Flick, 2015; Bryman, 2012). The five main research paradigms are *positivism*, *critical realism*, *interpretivism*, *postmodernism*, and *pragmatism* (Saunders, Lewis and Thornhill, 2016). This study applies the positivism paradigm since its hypotheses concerns the impact of diversification on the growth of loans in the banking sector. In addition, these hypotheses are developed by using existing theory and can be empirically investigated using researchers' analysis tools rather than their values (Saunders, Lewis and Thornhill, 2016).

The choice of a specific philosophy helps to select the best suited of three research approaches including deduction, induction and abduction. The deductive approach starts from pre existing theory to develop hypotheses, and test those assumptions and, thus, it goes from general to the specific (Saunders, Lewis and Thornhill, 2016; Silverman, 2010). In contrast, the inductive approach moves from the particular to general, as researchers start from observations, and then look for patterns in the data, which can help to generate new theories (Bryman and Bell, 2015; Flick, 2015). Following Saunders, Lewis and Thornhill (2016), instead of moving from theory to data as in a deductive approach or data to theory as an inductive approach, abduction moves back and forth, or it is likely to combine

deduction and induction. This study implements the deductive approach as it was concerned with the need to investigate the casual relationships among variables in order to test hypotheses and, thus, generalise results rather than generate new theories (Saunders, Lewis and Thornhill, 2016).

Research methods take three main forms, namely, quantitative, qualitative, and mixed methods. With quantitative methods, numeric data can be effectively collected from a large number of respondents, measures using various quantitative techniques, such as questionnaires and, thus apply a variety of statistical analysis tools in order to test the established hypotheses (Bryman, 2012; May, 2011). Qualitative methods, on the other hand, collect information using a descriptive and non numerical approach, such as interviews, in order to examine the meaning of social phenomena, rather than causal relationships between variables (Feilzer, 2010; Berg, 2004). The quantitative data required for empirical analysis can be categorised into three groups, cross sectional data, time series data, and Longitudinal or panel data. In cross sectional data, variables from several entities are collected at the same point of time, while in time series data, variables from one entity are observed over a period. In panel data, on the other hand, variables from several entities are gathered over a period (Saunders, Lewis and Thornhill, 2016; Flick, 2015; Bryman, 2012; Greene, 2012; Gujarati, 2003). Mixed methods research is considered as the combination of quantitative and qualitative data collection techniques and analytical procedures. This study uses quantitative methods to collect panel data in order to investigate the impact of diversification on loan growth over a period of 12 years.

Following Goetz et al. (2016), a two-stage least squares (2SLS) methodology is applied to evaluate whether deposit diversification and geographic diversification have influence on the growth of gross loans and the growth of individual loan categories. The empirical regression model is given as follows:

$$L_{it} = \alpha_1 + \alpha_2 L_{it-1} + \alpha_3 HHI_{it-1} + \alpha_4 Bran_{it-1} + \alpha_5 X_{it-1} + \alpha_6 X_{t-1} + \varepsilon_{it} \quad (1)$$

Where i denotes the number of banks, and t represents the yearly time dimension.

The dependent variable - L_{it} is the growth of total gross loans (or of consumer loans, corporate loans, or other loans) for bank i at time t ; HHI_{it-1} denotes deposit diversification; $Bran_{it-1}$ represents geographic diversification; X_{it-1} is a matrix of bank-specific control variables that can impact loan growth (ROA, NPL, Capital, Liquidity, Size, and Ownership); X_{t-1} is a vector of additional macroeconomic control variables including GDP growth rate and lending interest rate and finally ε_{it} is an error term.

The need to control for the endogeneity of the diversification decision is identified in the studies of Stiroh and Rumble (2006), and Campa and Kedia (2002). To solve the

endogeneity problem, we use an instrumental variables (IV) approach and apply the 2SLS estimator. Also, all the bank-specific variables and macroeconomic control variables are lagged one period to mitigate any possible endogeneity bias (Kim and Sohn, 2017; Cull and Martínez Pería, 2013).

4. RESULTS

Table 2 illustrates the summary statistics for all variables in the sample. There are variations in both the growth of gross loans and growth of each loan type. In addition, growth of branches (denoting geographic diversification) significantly varies with a range from zero to 61.11%. The mean of *HHI* (0.621) indicates a relative concentration within the range of deposit categories banks engage in.

Table 2: Descriptive statistics

<i>Variable</i>	<i>Mean</i>	<i>Median</i>	<i>StdDev</i>	<i>Min</i>	<i>Max</i>
Growth rate of gross loans _{it}	0.246	0.195	0.216	-0.045	0.810
Growth rate of consumer loans _{it}	0.288	0.239	0.310	-0.189	1.129
Growth rate of corporate loans _{it}	0.214	0.157	0.238	-0.100	0.797
Growth rate of other loans _{it}	0.069	0	0.498	-0.782	1.392
<i>HHI</i> _{it-1}	0.621	0.63	0.146	0.36	0.85
<i>Bran</i> _{it-1} *	11.585	2.985	17.703	0	61.11
<i>ROA</i> _{it-1} *	1.055	0.995	0.627	0.11	2.305
<i>NPL</i> _{it-1} *	2.028	1.9	1.118	0.4	4.8
<i>SIZE</i> _{it-1} *	4.484	2.69	4.62	0.48	16.04
<i>Capital</i> _{it-1}	0.099	0.086	0.044	0.050	0.206
<i>Liquidity</i> _{it-1}	0.872	0.8538	0.184	0.575	1.252
<i>Ownership</i> _{it-1}	0.136	0	0.344	0	1
<i>GDP</i> _{t-1} *	6.19	6.225	0.633	5.25	7.13
<i>LIR</i> _{t-1} *	10.682	10.22	3.352	6.96	16.95

Note: Variables with an asterisk are in percentages.

Source: Authors' calculations.

The growth of gross loans

Column (1) of Table 3 presents the estimation results for the growth of gross loans for commercial banks in Vietnam. We find that there is no impact of deposit diversification on the total loan expansion. By contrast, there is a statistically significant relationship between geographic diversification and total loan growth. The positive coefficient of this variable implies that banks tend to expand their credit to borrowers when there are more

branches. To an emerging country like Vietnam, small and medium-sized enterprises (SMEs) have dominated the economy with their contribution to the GDP. The number of SMEs accounts for 95 percent of all enterprises in Vietnam and their presence is more geographically spread out. A diversification strategy through branches, therefore, has an important implication for the banks' lending activity and helps banks meet the demand for more customers' finance in many local markets. It can clearly be seen in our sample that there has been a rapid rise in the quantity of bank branches over the last decade. Also, Vietnamese commercial banks have boosted their market share to increase traditional activities and improve performance through more market entry across various regions.

Regarding other bank-level factors, the estimation reveals the significant impacts of bank size and ownership on the total loan growth with expected signs. Concerning the effect of size, its estimated coefficient is negative, signifying that large banks concentrate less on traditional lending activity as compared to small banks. This result is in line with the finding of Kim and Sohn (2017). It is consistent with Cull and Martínez Pería (2013) when they assess the relationship between bank size and loan growth in developing countries in Eastern Europe and Latin America before the 2008-2009 crisis. Recently, taking advantage of large size, Vietnamese commercial banks have varied their portfolio by engaging in different types of activities rather than focusing on lending.

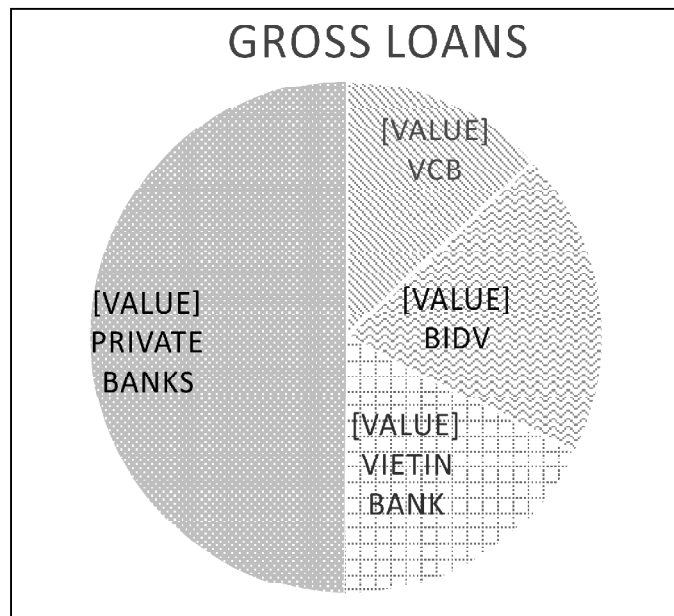


Figure 1: The share of gross loans between state-owned banks and private banks from 2008 – 2019

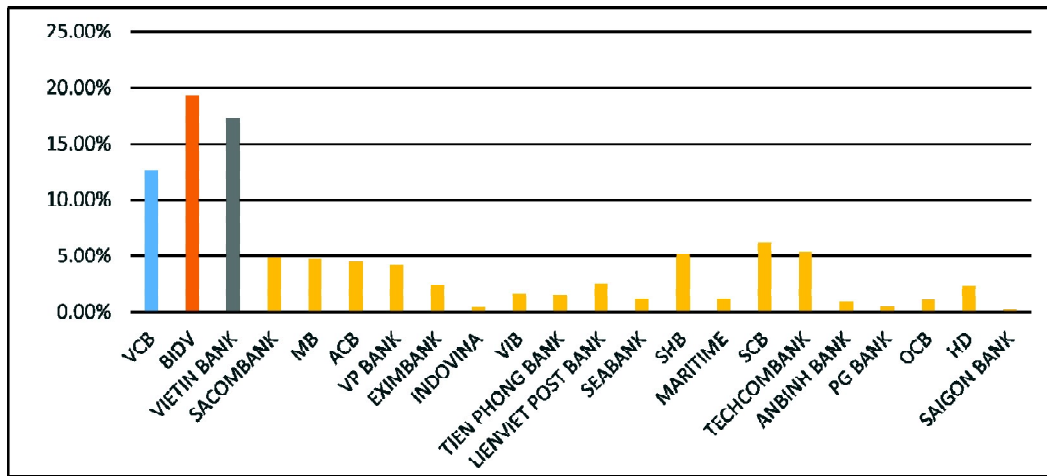


Figure 2: The growth of gross loans between state-owned banks and private banks from 2008 - 2019

Generally, gross loans of the three state-owned banks (VCB, BIDV, VIETIN BANK) accounted for more than 50% of all sample banks' gross loans and their growth of gross loans is higher than other privately-owned banks.

In terms of bank ownership, state-owned banks continue to dominate the banking system in Vietnam with the largest number of branches and customers. Moreover, these banks are under the control of the government to launch new lending schemes that aim at supporting domestic production and businesses. Notably, the state-owned banks play crucial roles in supplying credits to the priority sectors such as agriculture, export, SMEs, and enterprises applying advanced technology. A glance at the result at Column (1) of Table 3, there is a significantly positive influence of ownership on the total loan growth.

The other bank-specific variables, however, do not influence the change in annual gross loan growth, except for the lag one-order value of gross loan growth. For all macroeconomic variables, the estimated coefficients are also found to be insignificant.

The growth of consumer, corporate and other loans

The growth of each loan type replaces the growth of gross loans to assess the extent to which diversification influences loan growth for the consumer, corporate and other category in the Vietnamese banking sector. Column (2) – (4) of Table 3 show the results of regressions for the growth rate of consumer, corporate and other loans, respectively.

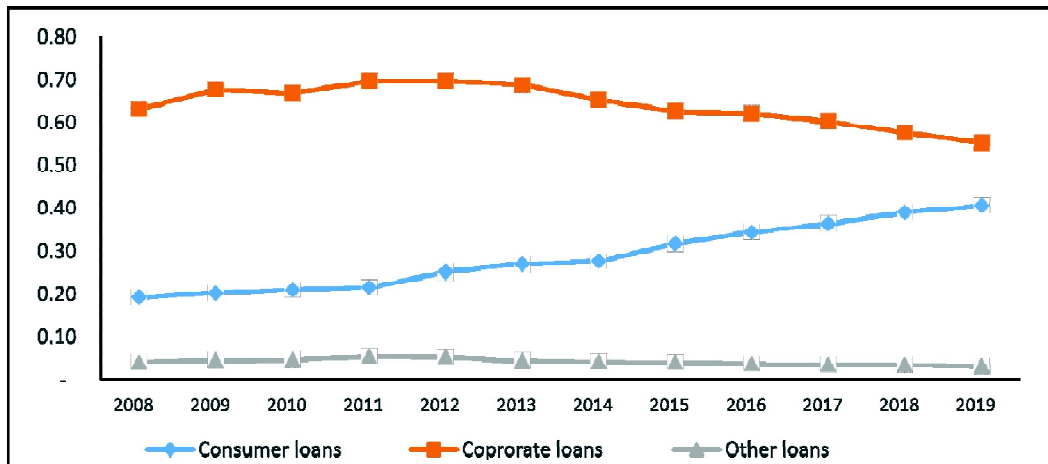


Figure 3: The ratio of each loan category to gross loans

Interestingly, the coefficient of HHI is significantly positive only for the consumer loan growth. It implies that more concentrated could lead to a rise in the growth rate of consumer loans or there is the negative relationship between deposit diversification and the growth rate of consumer loans. Despite expanding non-traditional activities, the operation of commercial banks in Vietnam is heavily based on deposit-funded loans (basic intermediation activities). On the one hand, banks could benefit from more deposit products by attracting more depositors from various social segments to fund more loans. On the other hand, diversified terms of deposit products could mismatch with the terms of consumer loans, and then conversely affect the ability to grow bank consumer loan portfolios.

Specifically, the coefficient of the bank branch variable is positive and statistically significant in the case of consumer and corporate loans. The implication is that the growth of the two loan types are likely to increase with the rise of gross loan growth when banks open more branches. However, this coefficient is insignificant for other loans growth. Similarly, consumer and corporate loan growth are found to be negatively related to bank size. The growth rate of consumer and corporate loans could follow by a decline in the size of banks.

There is a notable difference between the impact of state versus private ownership on consumer loans growth while this indicator does not significantly involve the growth of corporate and other loans. Accordingly, state-owned banks tend to exhibit not only a higher growth rate of gross loans but also of consumer loans. Fig.4 and Fig 5 show the shares of consumer loans and the growth of consumer loans between state-owned banks

and privately owned banks in our sample, respectively. Average consumer loans of three state-owned banks made up nearly 40% of 22 banks and their growth rate of this loan type are higher than most of the private banks.

Following the empirical estimation in Column (3) of Table 3, there is a significantly negative link between capital and corporate loan growth. It indicates that this loan type may have a slower growth rate when banks are better capitalized. In addition, the growth for corporate loans in the current year is associated with its value in the previous year. For the case of other loans, the profitability effect (captured by ROA) is negative, implying that banks with weak profitability are able to grow their other loans. On the contrary, other variables do not affect the growth of other loans (the impact of bank size or ownership on other loans growth are weak). Finally, the effect of GDP is found to be strong only for the case of consumer loan growth. The significance and positive sign of GDP is as expected. A boom in the economy could enhance households' income; consequently, consuming debtors can finance their debts and have fewer incentives to borrow for consumption. Nonetheless, there is no evidence that the lending interest rate influences any loan type growth.

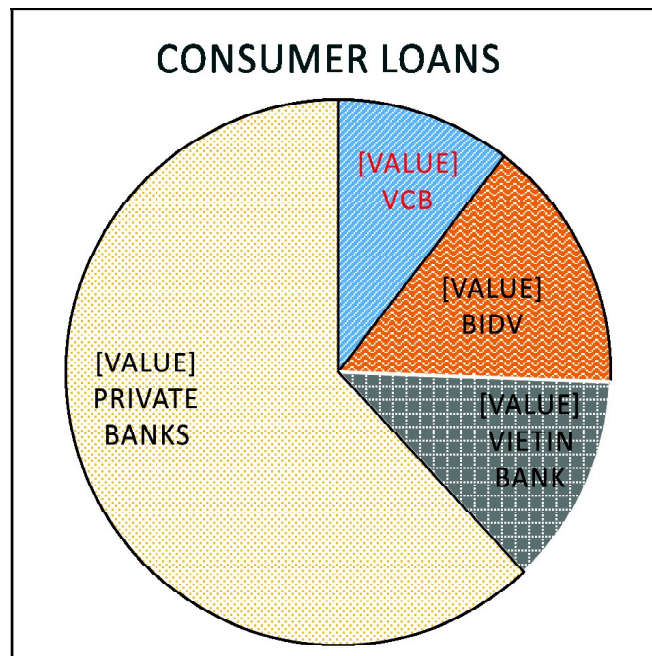


Figure 4: The shares of consumer loans between state-owned banks and privately-owned banks from 2008 - 2019

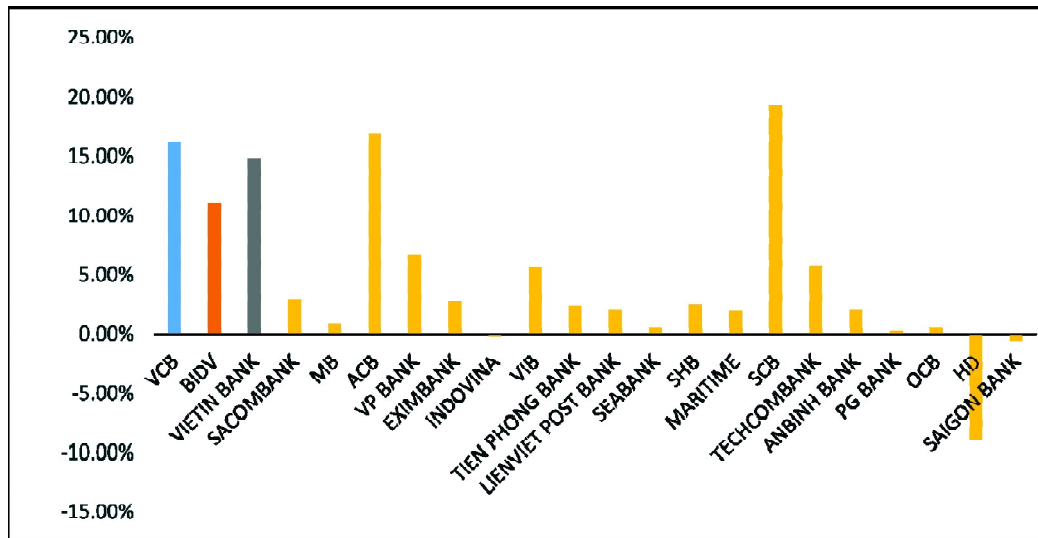


Figure 5: The growth of consumer loans between state-owned banks and private banks from 2008 - 2019

Table 3: Empirical results

	<i>Growth rate of gross loans</i>	<i>Growth rate of consumer loans</i>	<i>Growth rate of corporate loans</i>	<i>Growth rate of other loans</i>
	(1)	(2)	(3)	(4)
HHI_{it-1}	0.0319 (0.34)	0.304** (1.96)	0.272 (1.56)	-0.202 (-0.72)
$Bran_{it-1}$	0.0026** (2.09)	0.0031** (2.13)	0.0024** (2.07)	0.0023 (0.46)
ROA_{it-1}	-0.00267 (-0.06)	0.106 (1.45)	-0.0353 (-0.38)	-0.261** (-2.18)
NPL_{it-1}	-0.0064 (-0.18)	-0.0311 (-0.74)	-0.0320 (-0.98)	0.0348 (0.30)
$Capital_{it-1}$	-1.028 (-1.04)	-2.750* (-1.84)	-2.056** (-2.30)	2.322 (1.24)
$Liquidity_{it-1}$	-0.0782 (-0.55)	-0.356 (-1.46)	0.140 (0.71)	0.184 (0.44)
$Size_{it-1}$	-0.0220** (-2.02)	-0.0753*** (-3.19)	-0.0388** (-2.21)	0.0725* (1.72)

contd. table 3

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	<i>Growth rate of gross loans</i>	<i>Growth rate of consumer loans</i>	<i>Growth rate of corporate loans</i>	<i>Growth rate of other loans</i>
	(1)	(2)	(3)	(4)
Ownership _{it-1}	0.233** (2.12)	0.902*** (3.67)	0.332 (1.60)	-0.755* (-1.69)
GDP _{t-1}	-0.0495 (-1.39)	-0.127*** (-2.58)	-0.0405 (-0.98)	0.0250 (0.20)
LIR _{t-1}	-0.0056 (-0.82)	-0.0176 (-1.25)	0.0073 (0.69)	-0.003 (-0.20)
Growth rate of gross loans _{it-1}	0.231** (2.48)			
Growth rate of consumer loans _{it-1}		-0.148 (-1.63)		
Growth rate of corporate loans _{it-1}			0.226*** (2.64)	
Growth rate of other loans _{it-1}				0.0829 (0.82)
Constant	0.724* (1.84)	1.834*** (3.65)	0.429 (0.94)	-0.395 (-0.36)
N	197	179	169	149
R ²	0.7128	0.4949	0.4584	0.4243
Wald χ^2	107.87	49.44	55.31	27.42
Log-likelihood	-53.935	-24.72	-27.655	-13.71

t statistics in parentheses

*, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

5. ROBUSTNESS CHECKS

This section demonstrates further empirical tests that have been carried out to consider whether our main results are consistent. Generally, the main findings of the robustness checks are broadly similar to the main results. The same methodology (2SLS) is used.

First, ROA is employed in the primary regressions to measure banks' profitability. However, there is a concern that using ROA to approximate bank earnings could cause misleading results. Therefore, we use ROE as another proxy of profitability and re-estimate our models. Table 4 shows the results of new regressions for the growth of gross loans and each loan type. Highly similar results are obtained in this additional analysis of robustness. In terms of our main interest, geographic diversification is strongly significant

to the growth of gross loans, consumer loans and corporate loans. It continues to indicate that greater diversification of geography leads to higher growth rate of gross loans and these two major loan categories. Meanwhile, deposit diversification retains its significance on the growth of consumer loans but its impact is slightly weaker. Other control variables do not change their effects as compared to the original results.

Second, a set of control variables is included into the regressions to avoid a potential omitted variable problem. In respect of the macroeconomic condition, not only GDP growth and the lending interest rate but the inflation rate also is expected to affect bank loan growth. However, there is multicollinearity between the lending interest rate and the inflation rate. Consequently, we have not used both macroeconomic indicators at the same time in the regressions. As a robustness check, further estimations are conducted by using the inflation rate instead and Table 5 performs the results of this test. Clearly, the results provide evidence that the results are robust and consistent for all variables. Geographic diversification maintains statistically positive influences on the gross loans growth and the growth rate of consumer and corporate loans. An exception is the impact of deposit diversification on the consumer loan growth. The effect is still significant with a negative sign (or the positive sign of *HHI* indicator denoting deposit concentration); however, its significance is weaker at the 10% level.

Table 4: Robustness Test (Replacing ROA by ROE)

	<i>Growth rate of gross loans</i>	<i>Growth rate of consumer loans</i>	<i>Growth rate of corporate loans</i>	<i>Growth rate of other loans</i>
	(1)	(2)	(3)	(4)
HHI_{it-1}	0.0250 (0.25)	0.267* (1.75)	0.287 (1.51)	-0.114 (-0.37)
$Bran_{it-1}$	0.0026** (2.14)	0.0037*** (2.68)	0.0027** (2.46)	0.0021 (0.42)
ROE_{it-1}	0.240 (0.48)	0.282 (0.50)	-0.587 (-0.76)	-2.255** (-2.09)
NPL_{it-1}	-0.0290 (-0.93)	-0.0364 (-0.82)	-0.0387 (-1.05)	0.0272 (0.24)
$Capital_{it-1}$	-1.023 (-1.01)	-2.135 (-1.29)	-2.596** (-2.06)	-0.0839 (-0.04)
$Liquidity_{it-1}$	-0.128 (-0.92)	-0.293 (-1.26)	0.161 (0.82)	0.226 (0.54)

contd. table 4

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	<i>Growth rate of gross loans</i>	<i>Growth rate of consumer loans</i>	<i>Growth rate of corporate loans</i>	<i>Growth rate of other loans</i>
	(1)	(2)	(3)	(4)
Size _{it-1}	-0.0304** (-2.20)	-0.0685*** (-2.91)	-0.0408** (-2.23)	0 . 0 6 5 8 (1.59)
Ownership _{it-1}	0.319** (2.49)	0.821*** (3.46)	0.362* (1.74)	- 0 . 6 5 0 (-1.52)
GDP _{t-1}	-0.0584 (-1.58)	-0.119** (-2.31)	-0.0344 (-0.81)	0 . 0 1 7 9 (0.14)
LIR _{t-1}	-0.0063 (-1.05)	-0.0133 (-0.95)	0.010 (0.86)	- 0 . 0 0 4 7 (-0.27)
Growth rate of gross loans _{it-1}	0.201** (2.07)			
Growth rate of consumer loans _{it-1}		-0.122 (-1.38)		
Growth rate of corporate loans _{it-1}			0.209** (2.44)	
Growth rate of other loans _{it-1}				0.0734 (0.74)
Constant	0.885** (2.42)	1.700*** (3.34)	0.439 (1.01)	-0.166 (-0.15)
N	197	179	169	149
R2	0.7183	0.4098	0.4464	0.4032
Wald χ^2	103.89	46.69	49.47	31.79
Log-likelihood	-51.945	-23.345	-24.735	-15.895

t statistics in parentheses

*, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

Table 5: Robustness Test (Replacing Lending interest rate by Inflation rate)

	<i>Growth rate of gross loans</i>	<i>Growth rate of consumer loans</i>	<i>Growth rate of corporate loans</i>	<i>Growth rate of other loans</i>
	(1)	(2)	(3)	(4)
HHI _{it-1}	0.0316 (0.33)	0.305* (1.96)	0.263 (1.55)	-0.196 (-0.70)

contd. table 5

	<i>Growth rate of gross loans</i>	<i>Growth rate of consumer loans</i>	<i>Growth rate of corporate loans</i>	<i>Growth rate of other loans</i>
	(1)	(2)	(3)	(4)
Bran _{it-1}	0.0026** (2.08)	0.0031** (2.09)	0.0027** (2.22)	0.0017 (0.33)
ROA _{it-1}	-0.00517 (-0.13)	0.0969 (1.34)	-0.0127 (-0.15)	-0.254** (-2.03)
NPL _{it-1}	-0.0097 (-0.27)	-0.0320 (-0.77)	-0.0348 (-1.02)	0.0347 (0.29)
Capital _{it-1}	-1.041 (-1.03)	-2.767* (-1.82)	-2.105** (-2.43)	2.358 (1.30)
Liquidity _{it-1}	-0.0781 (-0.54)	-0.358 (-1.48)	0.150 (0.77)	0.0792 (0.25)
Size _{it-1}	-0.0227** (-2.05)	-0.0759*** (-3.16)	-0.0374** (-2.25)	0.0708* (1.67)
Ownership _{it-1}	0.239** (2.16)	0.910*** (3.63)	0.313 (1.57)	-0.724 (-1.60)
GDP _{t-1}	-0.0473 (-1.30)	-0.114** (-2.54)	-0.0635 (-1.48)	0.0363 (0.30)
INF _{t-1}	-0.0036 (-0.83)	-0.0109 (-1.16)	0.0001 (0.02)	-0.0003 (-0.03)
Growth rate of gross loans _{it-1}	0.227** (2.31)			
Growth rate of consumer loans _{it-1}		-0.154 (-1.57)		
Growth rate of corporate loans _{it-1}			0.218** (2.53)	
Growth rate of other loans _{it-1}				0.0841 (0.83)
Constant	0.691* (1.77)	1.667*** (3.91)	0.628 (1.38)	-0.410 (-0.39)
N	197	179	169	149
R ²	0.7113	0.4762	0.4933	0.4225
Wald χ^2	99.97	39.47	54.12	33.16
Log-likelihood	-49.985	-19.735	-27.06	-16.58

t statistics in parentheses

*, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

6. CONCLUSION

The empirical analysis aims to identify the role of diversification in loan growth in Vietnam. The study not only focuses on the growth of gross loans but also separately examines the growth of various individual loan types. The findings are in support of traditional portfolio and intermediation theories that banks can significantly benefit from loan growth diversification.

The study contributes to the existing literature in the following ways. First, we find evidence that geographic diversification (proxied by the growth of bank branches) statistically affects loan growth at Vietnamese commercial banks in the sample. More specifically, banks with a more diversified geographical expansion tend to grow their gross loan portfolio as well as two major loan types, consumer and corporate loans. Additionally, the results are robust for other bank-specific variables and when controlling for macroeconomic conditions. Our results remain consistent even when other additional tests are conducted. Second, contrary to the case of geographic diversification, the estimation suggests a significant impact of deposit diversification (product-market diversification) on the growth rate of consumer loans only. However, this result is weakly significant when we control for bank-level characteristics and macroeconomics by using another proxy of profitability or other macroeconomic indicators.

To an emerging country like Vietnam, lending is the core banking activity and the findings suggest important implications for bank managers and regulators. Policies related to sustaining bank loans and lending schemes should be implemented effectively by referring to banks' strategy of expanding their network and the composition of the deposit portfolio held. Moreover, further research should be carried out by considering the impact of international network expansion on loan growth once Vietnamese commercial banks have opened branches in other emerging countries in South East Asia, especially in Laos and Cambodia.

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