

# Financial Factors and Efficient Supply Chain Practices Affecting the Profitability of Vietnamese Commercial Banks

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**Abstract**-This paper empirically analyses the factors that determine the profitability of Vietnamese commercial banks from 2010 to 2018 along with the efficiency of supply chain practices. Due to the balance sheet data of 26 commercial banks in Vietnam, we use regression models such as OLS, REM, FEM, and GMM to find the correlation between the factors with the profitability of the banks. We found that the differences between the regression models and results of Sargan-Hensen test and AR (2) test showed that the GMM estimation model was the best to analyze the factors affecting the profitability of commercial banks in Vietnam. We recognize a positive correlation between the bank's profitability during these years with equity-to-total assets, the ratio of customer deposits to total liabilities, the annual growth rate of customers' deposits, diversification of income and efficiency of supply chain practices. The loans-to-total assets ratio, the ratio of loan loss provisions to net loans and the cost-to-income ratio will reduce the profitability of the bank as well as the non-economic of scale in the Vietnamese banking system. Finally, we found the macroeconomic factors giving an impact on the Vietnamese banking system.

**Keywords;** Bank profitability, Banking system, Commercial banks, Supply Chain.

## 1. Background

The banking system plays a crucial role in the development of the economy, functioning as a system to mobilize, allocate capital for production and business activities, and promote the circulation of goods through the payment service of the bank. Facing the trend of international integration and financial liberalization, the competition of commercial banks (commercial banks) in Vietnam has been becoming increasingly fierce and harsh. This commitment to opening up the financial market allows foreign banks to open branches in Vietnam. With modern technology, abundant capital, long experience, management level, quality, and service diversity, it will be great pressure for domestic banks. Banks that are not able to compete will gradually be replaced by banks with more efficient and high-profit operations.

Literature from the supply chain witnessed that with the passage of time the concept of supply is securing more

importance. In past, the supply chain was only considered in the mean of transportation. Now the supply chain has proved that it has an effect on the entire process of the organization. Irrespective of the matter that the organization is product or service-oriented. The supply chain is equally important for almost all business entities. The business world is more conscious about the implementation of the supply chain. The supply chain management operates according to the nature of services provided by the organization. In terms of the production process, the operating activities of the supply chain are entirely different in comparison with a services-oriented organization. The importance of services providing organizations can't be ignored. The present investigation is about the banking system. In the banking system, the supply chain responds in different manners like integrated supply chain, supply chain information sharing system etc. [2, 20].

The prime aim of supply chain management in the banking system is to remove the communication barrier between all the stakeholders with the help of monitoring, cooperation, and controlling process in the organization. Some studies proposed that the supply integration aims to strengthen the connection between multiple components exist between the chain process of the organization. The process results provide more flexibility while taking and decision [5, 18].

An efficient supply chain management system affect the organization's operations positively. Literature proposed that there is a positive association reported between supply chain management and the business performance of the organization. The banking system of any country is all about the customers. Studies proposed that there is a positive association reported between supply chain integration and firm financial performance [3, 8].

Along with the development and contribution of commercial banks, the Vietnamese economy has also achieved achievements during more than 20 years of renovation such as pushing back and curbing inflation, improving macro-economy and environment. Investment school; mobilizing domestic capital sources for production

and business development, investment and import-export activities. Therefore, it can be affirmed that the role of commercial banks cannot be ignored in any economy because of the importance of commercial banking functions as financial intermediaries, which can attract leisure capital. available through the mobilization of savings deposits for lending as well as the implementation of investment advisory services, entrustments ... Since joining the WTO, competition in the economic sector has become more intense, especially in the banking sector. After more than 10 years of joining the WTO, Vietnamese commercial banks have shown weaknesses such as poor asset quality, liquidity problems, low profits, weak governance, and the ability to manage risks and securities. It shows that the operation of commercial banks is ineffective and unfair competition. This was demonstrated in the 2008 financial crisis, the interest rate race made deposit interest rates increase significantly (21%/ year). By 2011, fluctuations in interest rates among banks became fierce and risky. Banks have broken the limit in mobilizing capital, the interest rate has risen to 22% / year, leading to a high-interest rate of 25% / year. By the beginning of 2013, the bad debt increased sharply, according to the SBV's announcement of 4.67% in April 2013, although according to independent evaluation agencies, the actual number was much higher. Facing this situation, the Government approved a scheme to restructure the system of credit institutions between 2011 and 2015 to reverse the risk of bank system collapse, improve liquidity system, political security and social safety were maintained, creating a trust for the citizens. From a quite backward economy due to a long war to reunify the country in 1975. Vietnam gradually restored its economy with policies of reform, innovation and opening up the international economic integration. From a poor country to a middle-income country in the world and more than 45 million Vietnamese people escaped from poverty, the poverty rate dropped sharply from over 70% in 2000 to less than 6% in 2018. GDP per capita will reach over USD 2,500 in 2018. The average GDP growth rate from the five periods of 2000-2018 will increase by 6.7% / year. In addition, the enhancement of cooperation and open trade with other countries have had positive results, changing the trade balance clearly. Specifically, if in 2000, the total import-export turnover was the only US \$ 30 billion, by 2018, the total import-export turnover would reach the US \$ 480 billion, bringing Vietnam from a country ranked 50th in terms of exports and ranked 44th in import in 2006, by 2018 it increased to 26th in the export of goods and services and 23rd in the import of goods and services worldwide. With this result, Vietnam is continuously in the group of 30 countries and territories with the largest import and export value of goods in the world, while within ASEAN, Vietnam has the third position in import and exports, only after Singapore and

Thailand. Total trade turnover in the period of 2004 - 2018 reached the US \$ 3,311 billion. In which, export value is 1,063 billion USD, the import value is 1,688 billion USD. Import turnover increased faster than exports, leading to a sharp increase in Vietnam's trade balance deficit in 2007. The trade deficit soared from USD 5.06 billion in 2006 to USD 14.12 billion in 2007 and reached 18.02 billion USD in 2008. In the two years 2007 - 2008, the trade deficit was 1.27 times higher than the whole period of 2000-2006. In the period of 2009 - 2011, the trade deficit value still remained in Highs then tend to decrease. In 2012, the trade balance had a surplus of USD 748 million and increased to USD 2.37 billion in 2014. In 2015, the trade balance fell to a deficit of USD 3.55 billion and by 2016 unexpectedly. peaked at \$ 2.52 billion. By 2018, Vietnam's total import-export value in 2018 reached the US \$ 480.17 billion, up 12.2%, equivalent to an increase of US \$ 52.05 billion in absolute terms compared to 2017. Thus, the balance of Vietnam's trade-in 2018 reached a surplus of US \$ 6.8 billion, 3.2 times higher than the surplus of 2017. These achievements have promoted commercial banks to develop effectively. If in 2002, ROA of Vietnamese commercial banks dropped sharply, then there was a breakthrough during the following years and peaked in 2007 and then decreased slightly but remained at 0.6% -1.2% from 2008 until now (except for 2015, it is 0.53%). The reason for the sharp decline in 2001-2002 is that some state-owned commercial banks are always at a loss when considering frozen debts and bad debts. The net profit of state-owned commercial banks in 1998 was VND 538.3 billion, respectively; In 1999, it was VND 645 billion; In 2000, it was 885.5 billion dong; In 2001, it was VND -305 billion; In 2002, it was VND -1,026 billion and in 2003 was VND 827 billion. In the period of 2006-2009, the period of hot growth in commercial banks reflected by the average ROA and ROE always maintained at a relatively high level. However, this period also revealed the weaknesses of small-scale commercial banks after spectacular growth, reflected in a significant decline in both ROA and ROE in 2008 and 2009. Wearing although from 2012 to 2017 the proportion of capital supply to the economy of commercial banks has decreased, the business results of commercial banks have grown positively. Profit after tax is estimated to increase by 52.3% compared to 2016. Profitability ratios are improved, ROA in 2018 reached 0.7%, ROE in 2018 reached 9.06%.

It is therefore essential to consider the overall situation and determine the factors affecting the profitability of commercial banks in Vietnam. It will help managers and policymakers have a basis to make decisions and complete a reasonable policy framework suitable for the operation of banks in the integration period, helping bank administrators and investors make the right decisions. Stemming from the above practical and urgent

requirements, we research the topic: "Factors affecting the profitability of Vietnamese commercial banks".

## 2. Hypotheses development

The business strategy of a bank is an overall and long-term operational program aimed at creating a certain development step of the bank, which is an advance commitment to the basic and comprehensive objectives. A bank needs to achieve and allocate key resources to achieve those goals in its future operating environment. Therefore, the bank's business strategy must be based on the Government's Financial Policy, the development of the financial system, and the reality of the bank's business activities to ensure the redundant, must be easily changed to adapt to changes of the market in each specific period and period. Therefore, when the goal of improving financial capacity, improving the operational efficiency expressed in the bank's business strategy is a sure guarantee for success, an increase in profits. This objective can be affected by factors such as capital size, customer deposit size, quality of bank assets, degree of diversification, operating costs, technology situation. There have been many types of research on the factors affecting the profitability of commercial banks in the world. In spite of the differences in territories and periods of time, the factors affecting the profitability of commercial banks include the financial factors of the banking system and macroeconomic financial factors.

We are living in a technological world. The world has become a social village. They are no boundaries for the business. The advancement in technology also affects the business world. The competition between the firms is accelerating at a rapid pace. The financial institution is getting more effect from it. The banking system in the world is all about customers. If the customers are satisfied this will ultimately enhance the performance of the firm. The supply chain process intervention to enhance firm performance is considered very vital. In the banking system, the supply chain is all about the integration, information sharing and SOPs. The supply chain integration is to train the employee to build a; long term and healthy relation with the customer. The efficient the supply chain activities the more chances of customer satisfaction [6]. The supply chain integration is all about the in-house employee's cooperation, coordination, training etc. to enhance the firm performance. The supply chain in the form of information sharing is to exchange the information in such a way that it positively influences the organization internally as well as externally. At the first step, the firm receives information from all the stakeholders. In the second step, the supply chain management organizes the information in a demanding way. At the final step, the organization deliver the information to the right person at the right time. There is a positive association reported between supply chain

management and firm performance [10]. The supply chain is also responsible for the proper implementation of the SOPs of the organization.

Literature proposed that the personal cooperation within the organization enhance the organization production and service capacities [24]. The rapid increase in the business world must accelerate the competition which results in increasing demand of the customers. This increasing demand of the customers strongly affects the organization's decisions. Additionally, the organization adjust its decisions in order to meet the customer's demand. The supply chain management is about strengthening the relationship between the firm and the clients. The supply chain management allows the employees to be connected with the clients in order to secure more business. As the increase in business is the ultimate aim of any organization. In the present investigation, the efficient supply chain activities strongly affect business profitability. The more the supply chain activities are efficient within the organization the positively influence the organization profitability. There is a positive association between supply chain and the firm performance [12].

The most critical financial factor of a commercial bank is capital, including legal capital and reserve funds. Thus, capital is the basic condition to ensure the business scale of a bank and the ability to compensate for possible losses, mainly determining the profit of the bank. In general, everyone believes that a bank with good capitalization will have high performance and good profit. Besides, studies of [11], [22], [14], [17] showed similar results. Studies have shown that banks with good capitalization face a lower risk of default. Moreover, a strong capital structure is necessary for banks in a developing economy, as it provides additional strength to banks that can withstand the financial crisis and the safeness for bank depositors in the circumstance of unstable macroeconomic conditions.

The liquidity of a commercial bank is seen as an instantaneous ability to meet the demand for deposits and disbursement of committed credits. Thus, liquidity risk is the type of risk when the bank is unable to provide sufficient cash for immediate liquidity needs; or supply sufficiently but at a high cost. Thus, liquidity risk is a type of risk for banks when holding a lower amount than deposits. With the previous study of [4], there is a negative relationship between liquidity risk and profit of banks because the assets of these banks do not exist in the form of cash but are invested in other activities that bring higher profits. Furthermore, risk-taking is one of the main drivers of banks' profits. Therefore, the asset quality of the loan portfolio is used as a proxy for credit risk, as measured by the ratio of the risk provision divided by the net interest income. This ratio is calculated as the adjusted value of loans to customers, recorded in the income

statement, net interest income. Over a long period of time, low credit quality can negatively impact the return on non-repayment costs that may be higher for banks with lower asset quality with banks with higher asset quality. Banks must keep risks within certain limits, ensure liquidity in accordance with the necessary level in the structure of assets and acceptable profitability levels, in order to be able to stand firm and compete in a business environment, being too focused on one element or another, will negatively affect business results. If a bank is cautious about risks, excessive liquidity, it will lead to reduced profits, more damaging than making customers lose trust, and look for other places that are more beneficial to them. On the contrary, if accepting high risks, low liquidity to expand profitable businesses will risk insolvency, easily leading to bankruptcy. All this directly affects the performance of the bank. Study [11] showed that risk provision effect negative to the bank's profitability.

The effect of bank size on profits can be nonlinear, there are banks with initial profits increasing along with the scale and then gradually reducing the non-economic scale. In principle, it is expected that large banks will have experience and advantages in increasing profits thanks to economies of scale. However, on a certain threshold of scale, non-economic factors of business scale may arise, causing the size of banks to affect the profitability of banks. The studies of [1], [9], [22], [14] have different research results on this issue. In the circumstance of the strong development of science and technology, banks have been making more and more efforts to apply modern technology in activities that create favorable conditions for people and investors to access advanced banking products and services, improving operational efficiency and competitiveness. The studies of both [1] and [7] concluded that income diversification will increase the profits of banks from non-interest income. A positive correlation between non-interest income and bank profit. [7] said that initially, commercial banks often increased diversification by expanding business activities or underwriting insurance contracts. Additionally, a bad debt ratio is a sign that the bank is not utilizing all resources compared to normal to assess credit and monitor lending processes. The bad debt makes the entire banking system operate inefficiently. Asset quality has a direct impact on the profitability of banks and Increasing NPLs requires banks to make a provision, thus reducing profits.

When the economic, political, and social environment is stable, the production process takes place normally, the enterprises are capable of borrowing capital, and repaying capital, the banks' operation will be consequently stable. When the economy grows highly and stably, other areas of the economy need to expand the operation, the demand for loans consequently increases, making it easier for the banking sector to expand credit operations. Therefore, NPLs in banks also decreased because the financial

capacity of businesses in such good economic conditions will be improved. Thus, in this situation, the role of the bank is mediate between the savings and investment sector is maximized. Otherwise, when the economic, political, and social environment becomes unstable, the demand for loans decreases, the risk of overdue debts increases, and the NPLs are high, then the bank's performance will be sharply decreased. The relationship between economic growth and the bank's performance is mixed. On the contrary, [11] demonstrated that economic growth reduces the bank's performance. Besides, the relationship between inflation and bank performance, arguing that the impact of inflation on the bank's profit depends on the impact of inflation on the operating costs. [11] demonstrated the factors affecting the profitability of Jordan's commercial banks, the inflation factor affects negatively on the bank's performance. Whereas, [17], [1] showed that the inflation rate is almost negligible or has no effect on the bank's performance.

### 3. Methodology

The. This study analysis of factors affecting the profitability of Vietnamese commercial banks based on previous studies such as studies of [1], [13], [16], [11], and especially study of Ponce [19] with two groups of banking characteristics and macroeconomic factors, the proposed research model is as follows:

$$Y_{i,t} = \beta_0 + \beta_1 \text{Loan}/\text{TA}_{i,t} + \beta_2 \text{LLP}/\text{NLI}_{i,t} + \beta_3 \text{Eq}/\text{TA}_{i,t} + \beta_4 \text{Dep}/\text{TL}_{i,t} + \beta_5 \text{DepGR}_{i,t} + \beta_6 \text{CIR}_{i,t} + \beta_7 \text{SIZE}_{i,t} + \beta_8 \text{HHIRD}_{i,t} + \beta_9 \text{GDP}_{i,t} + \beta_{10} \text{INF}_{i,t} + \beta_{11} \text{SCPI}_{i,t} + \varepsilon_{i,t}$$

Index  $i$  represents each commercial bank, index  $t$  represents the year of observation.  $Y_{i,t}$  represents the profit of bank  $i$  in year  $t$  with the representative variables ROA and ROE,  $\varepsilon_{i,t}$  is the error and explanatory variable described in the following table:

**Table 1.** Definition of variables

Variables	Abbreviation	Research	Hypothesis
<b>Internal variables</b>			
Outstanding loans / Total assets (%)	Loan/TA	[19] [22]	H1(+)
Risk provisions / Total outstanding loans (%)	LLP/NL	[19]	H2a(+); H2b(-)
Capital and funds / Total assets (%)	EqTA	[11] [19]	H3(+)
Deposit ratio / Total liabilities (%)	Dep/TL	[19]	H4a(+)
Credit growth rate (%)	Dep GR	[19]	H4b(+)

Operating expenses / Operating income (%)	CIR	[19] [11]	H5(-)
Diversify income = $1 - [(INT/TOR)2 + (COM/TOR)2 + (TRAD/TOR)2 + (OTH/TOR)2]$	HHIRD	[19] [21] [7]	H6a(+); H6b(-)
Bank asset size	SIZE	[19]	H7(+)
<b>Macro variables</b>			
Annual GDP index	GDP	[19] Adeusi (2014)	H8(+)
Annual CPI index	INF	[19]	H9(+)
The ratio of time taken by supplier for deliver the products and total time allowed to supplier	SCP	[23]	H10(+)

The study used secondary data from 2010 to 2018 to analyze the factors affecting the profitability of commercial banks in Vietnam. The financial data used for research is collected from the financial statements of commercial banks. The above models were processed by Pooled OLS, FEM, REM, and DGMM regression methods. Simultaneously perform the Breusch- Pagan Lagrange Multiplier test, Hausman test, Sargan - Hensen test, and AR (2) test on the autocorrelation of residuals.

#### 4. Results

The statistical results describing the study variables are presented in Table 2. The average ROA of banks is 0.852% and the average ROE is 8.4%. It can be seen that the profit target of the bank during this period is quite low and there are significant differences between banks. This reflects the difficult business situation of the current banking system.

**Table 2.** Statistics the variables

Variables	Number	Mean	Standard Deviation	Min	Max
ROA	234	0.00852	0.00807	-	0.05952
ROE	234	0.08411	0.08523	0.82002	0.28464
LOAN/TA	234	0.17252	0.10578	0.00748	0.55585
LLP/NL	234	0.06996	0.16127	0.01891	1.84394
EqTA	234	0.09738	0.06255	0.03337	0.44278
DEP/TL	234	0.60280	0.13278	0.18511	0.89372
CIR	234	0.18404	0.46913	0.14996	6.80412
SIZE	234	7.81704	0.53442	6.38357	9.00277

HHIRD	234	0.32879	0.14117	0.00000	0.66267
DEPGW	234	0.29389	0.37400	0.31893	2.60996
GDP	234	0.05956	0.00576	0.05030	0.06780
INF	234	0.08483	0.06393	0.00630	0.19890
SCP	234	0.07458	0.05142	0.00574	0.21451

The correlation coefficient matrix between independent variables shows that there is no serious multicollinearity. Sargan and Hansen's tests in DGMM estimation are the chi-square test of instrumental variables' validity. A good instrumental variable must be appropriate, that is, correlated with endogenous variables as well as orthogonal to the remainder. Therefore, the rejection of the Ho hypothesis implies that instrumental variables do not satisfy the necessary orthogonal conditions. In the research model, the Ho hypothesis cannot be ruled out implying that the tool variables used are valid. Next, test AR for autocorrelation in AR (1) and AR (2). The AR test (2) is considered as an important test of the suitability of the limits for the instrumental variables. In the estimation, the second and third lag of the variables are specified as instrumental variables in the differential equation and the first lag of the variance is the instrumental variable in the regression of levels. The hypothesis that there is no second-chain correlation in the first-order differential residue is not rejected in the research model. Auditing AB results in AR (2) with a high p-value.

**Table 3.** Regression results of ROA

Variable s	ROA			
	OLS	FEM	REM	DGMM
L.ROA				0.27753** *
L.ROE				
LOAN/TA	0.0006	0.00149	0.00087	-0.00545
LLP/NL	0.0004	-0.00410	-0.00148	- 0.00198** *
EqTA	0.05724* **	0.04827* **	0.0552** *	0.06076** *
DEP/TL	0.0045	-0.00962*	-0.00086	0.00753**
CIR	-0.0016	-0.00051	-0.0013	- 0.00121** *
SIZE	0.00331* *	-0.00100	0.00287*	- 0.00961** *
DEPGW	0.0051	0.0072*	0.00693*	0.01249** *
HHIRD	0.00356* *	0.00394* **	0.00375* **	0.00147**
GDP	-0.0068	0.06912	0.01774	0.06158**
INF	0.03365*	0.00865	0.02677*	0.03011**

	**		**	*
SCP	0.04125* **	0.01451* *	0.02451*	0.04174** *
CONS	- 0.03061* *	0.00916	-0.02527*	
Prob > F	0.00000* **	0.00000* **	0.00000* **	0.00000** *
R-squared	20.52%	27.85%	25.26%	
Hausman test	0.1284			
Breusch and Pagan test	0.0000***			
Wooldridge test	0.0001***			
Arellano-Bond test for AR(2)				0.218
Sargan test				0.760
Hansen test				0.995

The dependent variables are ROA and ROE is the bank's profitability. The independent variables are Outstanding loans/Total assets (Loan/TA), Risk provisions / Total outstanding loans (LLP/NL), Capital and funds / Total assets (EqTA), Deposit ratio / Total liabilities (Dep/TL), Credit growth rate (DepGR), Operating expenses / Operating income (CIR), Diversify income =  $1 - [(INT/TOR)2 + (COM/TOR)2 + (TRAD/TOR)2 + (OTH/TOR)2]$  (HHIRD), Bank size (SIZE), efficiency of supply chain practices (SCP) and macro variables: Annual GDP index (GDP), Annual CPI index (INF). Hausman test, Sargan, Hensen, and AR tests (1), AR (2) used to test for regression model for data-panel.\*\*\*, \*\*, \* respectively represent the significance level of 1%, 5% and 10%.

**Table 4:** Regression results of ROE

Variable	ROE			
	OLS	FEM	REM	DGMM
L.ROA				
L.ROE				0.24421** *
LOAN/TA	0.02839	0.02684	0.03032	- 0.13813**
LLP/NL	0.00494	-0.02121	-0.00195	-0.02538
EqTA	-0.09355	-0.20826	-0.10269	0.01284
DEP/TL	0.05389	-0.06967	0.02506	-0.00033
CIR	-0.012	-0.00369	-0.01172	0.00238
SIZE	0.04426* **	-0.02751	0.04022* *	- 0.12105** *
DEPGW	0.06729*	0.04715	0.0724*	0.14857** *
HHIRD	0.04214* **	0.04838* **	0.04456* **	0.04498** *

GDP	0.17775	0.92988	0.31649	1.18886** *
INF	0.39586* **	0.11266	0.35539* **	0.18558** *
SCP	0.2142 **	0.11951* *	0.22481* **	0.29154** *
CONS	- 0.36692* *	0.26431	- 0.32423* *	
Prob > F	0.00000* **	0.00022* **	0.00000* **	0.00000** *
R-squared	17.95%	12.69%	8.62%	
Hausman test	0.0044***			
Breusch and Pagan test	0.0021***			
Wooldridge test	0.0352**			
Arellano-Bond test for AR(2)				0.389
Sargan test				0.723
Hansen test				0.991

The dependent variables are ROA and ROE is the bank's profitability. The independent variables are Outstanding loans/Total assets (Loan/TA), Risk provisions / Total outstanding loans (LLP/NL), Capital and funds / Total assets (EqTA), Deposit ratio / Total liabilities (Dep/TL), Credit growth rate (DepGR), Operating expenses / Operating income (CIR), Diversify income =  $1 - [(INT/TOR)2 + (COM/TOR)2 + (TRAD/TOR)2 + (OTH/TOR)2]$  (HHIRD), Bank size (SIZE), efficiency of supply chain practices (SCP) and macro variables: Annual GDP index (GDP), Annual CPI index (INF). Hausman test, Sargan, Hensen, and AR tests (1), AR (2) used to test for regression model for data-panel.\*\*\*, \*\*, \* respectively represent the significance level of 1%, 5% and 10%.

According to the results in Table 3 and Table 4, the risk provisions on the total outstanding loans, operating expenses over operating income, the size of the bank's assets have a negative correlation with the bank's profits. Capital and funds named total assets, customer deposits on total liabilities, credit growth, income diversification, annual GDP, annual CPI along with supply chain practices have a positive correlation with bank commentary.

It can be seen that after a long period of rapid and continuous credit growth along with limited ability to control risks and adverse factors of the economy, bad debts of the banking system began appearing and rapidly increasing since the end of 2011, seriously affecting the safety and operational efficiency of commercial banks, causing many commercial banks to fall into difficult, unprofitable and unsafe operations. Supply chain practices

efficiency also play a positive role on the profitability of the banks. Therefore, the handling of bad debts is an urgent requirement and an important task of the banking industry and requires the active participation of both the political and social system to reopen capital flows in the country. The economy is frozen in bad debts and financially healthy for commercial banks. [11], and [19] concluded that the higher the ratio of equity over total assets is, the higher the profits are. This argument reflects the direct relationship between equity and efficient supply chain practices and bank profit. These results are consistent with the expectation of the authors and present that the financing structure measured by the ratio of customer deposits over total liabilities is positively correlated with the bank's profitability. These results were similarly demonstrated in the study of Ponce [19]. According to these results, banks cannot earn much profit because they do not meet the requirements of service quality, management quality, labor efficiency, which increase costs but the efficiency is not high. Moreover, banks need to control their operating expenses, especially employee-related expenses and improve the efficacy of the supply chain since it accounts for the highest proportion.

A commercial bank with diversified business operations and services will disperse, reduce risks, and improve profits. Therefore, operating business with many banking services other than exclusive credit operations will help disperse risks and reduce risks thereby increasing the bank's profits. When diversifying the types of commercial banking services, they will fully and effectively use the technical facilities and staff of each bank. Therefore, it can help to reduce management costs, operating costs, and increase maximum profits for the bank. The efficiency of supply chain could increase the production and selling processes of the business while in case of banking, the supply chain practices could enhance the services of the banks that improve the profitability of the banks. Performing diversification of types of banking services can provide many types of banking services quickly, flexibly, and with high quality for customers. The results show that income diversification increases the profits of commercial banks [19].

## 5. Discussion and conclusion

According to the results, we propose the following solutions to improve profits for commercial banks in Vietnam:

Firstly, Vietnamese commercial banks need to improve the quality of credit activities. It is critical to review the appraisal process, the defects of the process. Credit officers also need to thoroughly grasp professional ethics, avoid overstating the value of loan-valuating assets, or ignore anticipated risks for personal benefits. At the moment, banks have very high bad debts due to many

reasons, of which the basic reason is that borrowing enterprises are currently facing many difficulties in business. Furthermore, their capital sources are mainly bank loans, the more difficulties they have, the more they need to loan. These subjects must be carefully considered and limited lending when the bad debt has not been settled. So, Considering and adjusting loan procedures such as reducing conditions on collaterals, considering supplementing the list of accepted assets as collateral, increasing the loan-to-collateral ratio, and easing customer screening criteria. Because the current ratio of loans to collaterals is quite high because most banks consider collaterals as the most important criteria to review loans, and loans are usually less than the value of the loan value of collaterals. This shows that Vietnamese commercial banks are avoiding credit risks by strict conditions with collaterals. In addition, in order to control credit risks, many commercial banks screened borrowers with regulations such as minimum net revenue, minimum business time, etc. Many difficulties in accessing credit loans.

The second solution is converting bad debts into equity. The bank will negotiate with customers about bad debts to determine its origin. The bank will subsequently consider the debts that can be recovered based on the identified causes. In case the customers are not able to pay, the bank will negotiate with customers to convert into capital contribution or shares. Banks also need to classify customers and recognize competent customers for continuous loaning.

Thirdly, increasing equity is also an effective strategy. At first, Vietnamese commercial banks need to expand the size of equity since the low equity will limit the banks' competitiveness. In addition, Vietnamese commercial banks need to strengthen their financial potentials by actively attracting investment capital from international organizations and foreign banks to increase their working capital and to transfer technology in the direction of modern commercial banks, which is capable of comprehensive competition in the international market.

The fourth suggested method is increasing the operational efficiency of the bank. Commercial banks need to pay attention and invest in modern services such as: mobilizing via payment accounts; mobilizing through investment accounts or the market arises. In international economic integration, Vietnamese commercial banks face many challenges from foreign banks when they have many advantages in technology and banking services. Therefore, Vietnam commercial banks need to invest in advanced technologies to better serve the provision of products and services as well as control banking operations, asset capital management, risk management, debt management and accounting, inter-bank payment system, electronic transaction system and remote monitoring ... to improve service quality for customers.

Besides, Vietnamese commercial banks need to cooperate and build strategic partners to support the development and exploitation of each other's technological infrastructure to reduce investment costs, management costs to improve the efficiency of using existing infrastructure.

Fifth, improving executive management capacity is one of the most important steps for improving the operational efficiency of commercial banks. They need to reform their management mechanism to follow new business thinking to minimize operational costs and to use resources efficiently. Besides, it is necessary to standardize the entire business process of major commercial banking activities and to accelerate the implementation of banking administrative reforms.

The sixth solution is diversifying income and continuing to shift the customer-driven model. In the context of an increasingly open economy, the competition between banks in Vietnam is becoming increasingly fierce, Vietnamese commercial banks need to switch to a modern model - towards customers. Therefore, Vietnamese commercial banks need to promote the application of modern technology that creates many utilities for customers, thereby attracting customers to the bank.

The relation between supply chain and firm performance is reported in different manners in different perspectives. Irrespective of the matter that the firm is dealing with products or the services. The supply chain management is a key element for firm performance. There is a positive association reported between firm performance and supply chain management [2, 15]. The results of this investigation show that effective supply chain management activities positively affect firm performance. The betterment in the firm performance also results in an increase in the profitability of the firm. So there is a positive association between the firm effective supply chain management system and the firm profitability.

Finally, the solution to help banks develop effectively is from customers. To access bank loans, customers must have collaterals. This contradicts the reality with the theory that collateral is only the last element in the consideration of credit extension, but with the information of enterprises not as transparent as currently, the fact that banks commercial goods focus on collateral when approving loans is obvious. Therefore, it is necessary to make financial information transparent so that commercial banks can easily accept loans and disburse capital. The transparency of financial information is done by using non-cash payment methods in the economy to increase information exchange between businesses and banks. The non-cash payment will help businesses' revenues, expenses, made through the bank's payment system will reduce the inconsistencies between financial statements

sent to banks and reports finance filed tax authorities. At the same time, the bank account statements of businesses will be more reliable and have a legal basis, which is the basis for commercial banks to use to assess the financial capacity of the business when appraising the problem loan offer. This investigation is limited to the banking system only. The supply chain management is taken up to activities only. Like numerous other studies, this study also has some future suggestions. First, In future studies, the concept of a supply chain can be considered in integrated manners. Second, the supply chain can also be introduced as an information-sharing system. Finally, the supply chain can be employed as a moderator or mediator in future studies.

## REFERENCES

- [1] A. Anbar and D. Alper, "Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Turkey," Business and Economics Research Journal, Vol. 2, No. 2, pp. 139-152, 2011.
- [2] C. Armistead and J. Mapes, "The impact of supply chain integration on operating performance," Logistics Information Management, Vol. 6, No. 4, pp. 9-14, 1993.
- [3] C. Ataseven and A. Nair, "Assessment of supply chain integration and performance relationships: A meta-analytic investigation of the literature," International Journal of Production Economics, Vol. 185, pp. 252-265, 2017.
- [4] A. Çekrezi, "Factors affecting performance of commercial banks in Albania," The European Proceedings of Social and Behavioural Science, Vol 13, 6, pp. 2357-1330, 2015
- [5] S. Chadha, "Empowering quality management systems through supply chain management integration: A survey of select hospitals in Chandigarh, Mohali and Panchkula," IUP Journal of Supply Chain Management, Vol. 10, No. 2, pp. 44-53, 2013.
- [6] R. Chavez, "The effect of customer-centric green supply chain management on operational performance and customer satisfaction," Business Strategy and the Environment, Vol. 25, No. 3, pp. 205-220, 2016.
- [7] R. Elsas, A. Hackethal, and M. Holzhäuser, "The anatomy of bank diversification," Journal of Banking & Finance, Vol. 34, No. 6, pp. 1274-1287, 2010.
- [8] B. B. Flynn, B. Huo, and X. Zhao, "The impact of supply chain integration on performance: A contingency and configuration approach," Journal of Operations Management, Vol. 28, No. 1, pp. 58-71, 2010.
- [9] S. Gul, F. Irshad, and K. Zaman, "Factors affecting bank profitability in pakistan," Romanian Economic Journal, Vol. 14, No. 39, pp. 61-87, 2011.
- [10] J. Jamshi and C. Ganeshkumar, "Causal linkage among business analytics, supply chain



- performance, firm performance and competitive advantage,” Parikalpana: KIIT Journal of Management, Vol. 13, No. 2, pp. 29-36, 2017.*
- [11] H. A. Khrawish, “*Determinants of commercial banks performance: Evidence from Jordan,*” *International Research Journal of Finance and Economics, Vol. 81, No. 1, pp. 148-159, 2011.*
- [12] P. Lii and F.-I. Kuo, *Innovation-oriented supply chain integration for combined competitiveness and firm performance,*” *International Journal of Production Economics, Vol. 174, pp. 142-155, 2016.*
- [13] K. F. Nsambu, “*Factors affecting performance of commercial banks in Uganda a case for domestic commercial banks,*” *Proceedings of 25th International Business Research Conference, 2014.*
- [14] T. M. Obamuyi, *determinants of banks’profitability in a developing economy: Evidence from Nigeria,* *Organizations and markets in emerging economies, Vol 4, No. 08, pp. 97-111, 2013.*
- [15] S. Oh, Y. U. Ryu, and H. Yang, “*Interaction effects between supply chain capabilities and information technology on firm performance,*” *Information Technology and Management, Vol. 20, No. 2, pp. 91-106, 2019.*
- [16] S. Oluwafemi, “*Determinants of commercial banks’ profitability panel evidence from Nigeria,*” *International Journal of Economics, Commerce and Management United Kingdom, Vol. 2, No. 12, pp. 39-47, 2014.*
- [17] V. O. Ongore and G. B. Kusa, “*Determinants of financial performance of commercial banks in Kenya,*” *International Journal of Economics and Financial Issues, Vol. 3, No. 1, pp. 237-252, 2013.*
- [18] M. Pakurár, “*The service quality dimensions that affect customer satisfaction in the Jordanian banking sector,*” *Sustainability, Vol. 11, No. 4, pp. 1-24, 2019.*
- [19] T. A. Ponce, “*What determines the profitability of banks? Evidence from Spain,*” *Accounting & Finance, Vol. 53, No. 2, pp. 561-586, 2013.*
- [20] R. Silvestro and P. Lustrato, “*Integrating financial and physical supply chains: the role of banks in enabling supply chain integration,*” *International Journal of Operations & Production Management, Vol. 34, No. 3, pp. 298-324, 2014.*
- [21] F. Sufian and R. R. Chong, “*Determinants of bank profitability in a developing economy: Empirical evidence from the Philippines,*” *Asian Academy of Management Journal of Accounting & Finance, Vol. 4, No. 2, pp. 379-408, 2008.*
- [22] M. Syafri, “*Factors affecting bank profitability in Indonesia,*” in *The 2012 International Conference on Business and Management, 2012.*
- [23] S. Yahya and B. Kingsman, “*Vendor rating for an entrepreneur development programme: A case study using the analytic hierarchy process method,*” *Journal of the Operational Research Society, Vol. 50, No. 9, pp. 916-930, 1999.*
- [24] Q. Yu, “*Enhancing firm performance through internal market orientation and employee organizational commitment,*” *The International Journal of Human Resource Management, Vol. 30, No. 6, pp. 964-987, 2019.*