MINISTRY OF FINANCE

UNIVERSITY OF FINANCE – MARKETING

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STUDY

ASSESSING THE OPERATIONAL EFFICIENCY OF VIETNAM COMMERCIAL BANK BY DATA ENVELOPE ANALYSIS (DEA)

SPECIALITY: FINANCE - BANKING

CODE: 9340201

SUMMARY OF PHD THESIS

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THESIS SUMMARY

During the last 10 years, the business performance of Vietnamese commercial banks has always been concerned, controlled , and restructured income. promote deep mining . Effective commercial banks will help operate more qualitatively and sustainably , contributing to promoting the development of the economy . Many studies in Vietnam on the performance of commercial banks focus on index evaluation with proportional variables (parametric model) such as ROA, ROE, NIM, etc., used as representative measures . for the performance of the NHS.

study evaluates the performance of Vietnamese commercial banks through the results of estimating the technical efficiency of commercial banks by data envelopment analysis (DEA) method and influencing factors in the evaluation of operational efficiency. business , specifically: (i) Estimating the technical efficiency of commercial banks Vietnam in the period of 2009 - 20 21 ; (ii) Test the results of the tobit regression model to determine the factors affecting the technical efficiency of Vietnamese commercial banks.

Research results show that Vietnamese commercial banks have achieved quite high technical efficiency and tended to change for the better during the research period. The scale of operations is increasing, and the technical efficiency is also gradually improving. Although the pure technical efficiency is high, the scale efficiency is higher, contributing much to the bank's business performance. Banks tend to change technologically more and more strongly, this change makes a

great contribution to improving productivity and improving business performance over the years.

From the research results, the thesis proposes some policy implications on governance to improve costs and improve operational efficiency of Vietnamese commercial banks.

Keywords: *Operational efficiency, technical efficiency, DEA, Tobit, commercial banks*

CHAPTER 1 : RESEARCH INTRODUCTION

1.1 Reasons for choosing the topic

1.2 Research objectives and research questions

1.2.1 Research objectives

Research project on operational efficiency of commercial banks in Vietnam in the period 2009-2021 through the results of technical efficiency estimates from data envelopment analysis (DEA) method and influencing factors in evaluating business performance . Specific goals:

- Estimating the technical efficiency of each bank and of all banks in the period 2009 - 2021 .

- Determining the factors affecting the technical efficiency of Vietnamese commercial banks.

- Clarifying the impact of factors affecting the technical efficiency of the bank and then proposing policy suggestions / implications for governance / models to improve / enhance the performance of the bank commerce.

1.2.2 Research questions

To achieve the above objectives, the study poses the following research questions:

- First, how is the technical efficiency of Vietnamese commercial banks in the period 2009-2021?
- Second, what factors affect the technical efficiency as well as quantify the impact of these factors on the technical efficiency of Vietnamese commercial banks?
- Third, from the research results, the policy /model suggestions any Is it suitable for managers and policy makers to improve

the performance of Vietnamese commercial banks?

1.3 Objects and scope of research

The object of the study is the technical efficiency of joint-stock commercial banks (excluding the merged and consolidated commercial banks in the research period) in Vietnam.

The remaining research subjects are the factors affecting the technical efficiency of Vietnamese commercial banks.

The thesis intends to use data collected from financial statements (audited and listed) of Vietnamese commercial banks in the period 2009-2021. The research phase was conducted to empirically verify the operational efficiency of Vietnamese commercial banks after the period of the international financial crisis 2007-2008 and after the strong social distancing due to the Covid-19 flu pandemic that occurred from early 2020 to 2021.

1.4 Research Methods

1.5 New contributions of the thesis

Scientific significance:

The study has contributed more empirical evidence in Vietnam on a modern approach, combining both asset and operating cost approaches to assess technical efficiency in evaluating business performance of commercial banks. Vietnam in the period after the financial crisis of 2007-2008 and lasting until after the social distancing due to the Covid-19 pandemic occurred from early 2020 to 2021. Domestic studies often use the DEA or DEA method. SFA or both for comparison, but the approach is usually based on assets, income or expenses , etc., but has not been able to assess the overall multi-dimensional impact on the specific operation of commercial banks. Technical efficiency is assessed to provide more

comprehensive results and clearly demonstrate the relevance in practice. Input/output variables on the basis of modern approaches have provided highly reliable technical efficiency estimates when the estimation results show a high degree of similarity with reality in the research period . .

In this study, the author also uses additional independent variables that reflect the direct influence on performance such as: Type of ownership, number of employees, level of income diversification and market share of employees. NHMs. The variables are grouped into groups of internal variables, industry environmental variables and macro variables, this method gives a more complete impact assessment than previous studies.

Practical significance:

Providing a practical basis on the impact of input/output factors on technical efficiency in evaluating business performance of commercial banks, helping managers to refer to and contribute to pointing out the effective/inefficient points to adjust/improve key factors to increase business performance at the bank itself, and at the same time propose policy recommendations.

Research results have shown that the correlation is consistent with the actual business activities of commercial banks studied in the period 2009-2021. Most commercial banks have achieved quite high technical efficiency and tend to change for the better. The growing scale of operations comes with better technical efficiency. Commercial banks tend to change rapidly in technological progress and contribute to improving productivity, helping to improve business performance of commercial banks.

With the advantage of scale of business operations, state-owned commercial banks have shown that scale efficiency has positively

contributed to business performance. The TFP composite factor productivity index has shown that commercial banks have improved year by year and improved productivity in business activities. The change brings business efficiency thanks to the large contribution of increased technical efficiency and technological advancement change. Banks continue to improve productivity through technological changes to optimize redundant operating costs.

During the research period, commercial banks had a decrease in efficiency due to excessive expansion, leading to uncontrolled increase in operating costs, especially massive network expansion. costs have increased but the efficiency has not increased correspondingly. Besides, the regression results have shown that state-owned commercial banks contribute to increasing business performance. In addition, the study also shows a negative correlation between economic growth rate and scale efficiency. Economic growth that is not accompanied by scale growth will lead to better business performance.

1.6 Dissertation layout

The thesis is organized according to the structure of 5 chapters, including the following contents:

Chapter 1: Introduction to the study

Chapter 2: Theoretical foundations and empirical evidence

Chapter 3: Research Methods

Chapter 4: Research results and discussion

Chapter 5: Conclusion and policy implications

CHAPTER 2 : THEORETICAL BASIS AND EXPERIMENTAL EVIDENCE

2.1 Theoretical basis

2.1.1 Overview of commercial banks

2 . 1.2 Operational efficiency of commercial banks

Efficiency *(OE)* is a measure of the benefits brought from business activities on the basis of costs spent , showing the correlation relationship of using all costs. spent and the benefits derived from it. The higher the operational efficiency, the higher the income or profit the business has for the same amount of expenses. The operational efficiency of a production unit or a Bank is achieved through the optimal allocation of given input resources to maximize output.

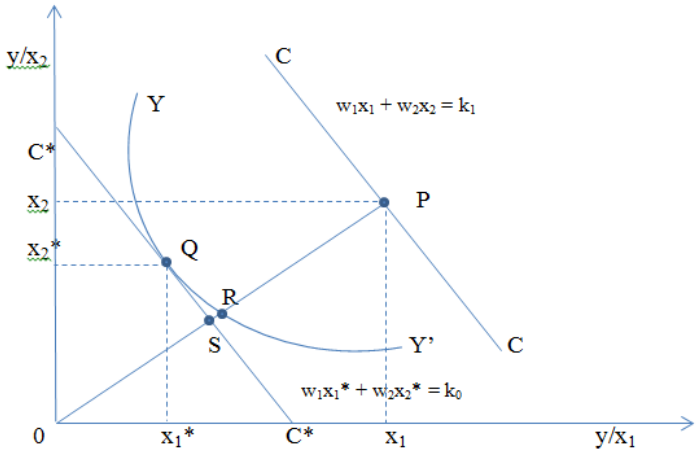
2.1.3 Classification of efficiency in evaluating the performance of commercial banks

According to Farrell (1957), performance evaluation will be based on efficiency classification into: cost efficiency (CE - Cost efficiency); economic efficiency (EE - Economic efficiency), which includes technical efficiency (TE - Technical efficiency) and allocative efficiency (AE - Allocative efficiency).

Technical efficiency reflects the unit's ability to produce maximum output with available inputs. Technical efficiency includes pure technical efficiency (PTE) and scale efficiency (SE).

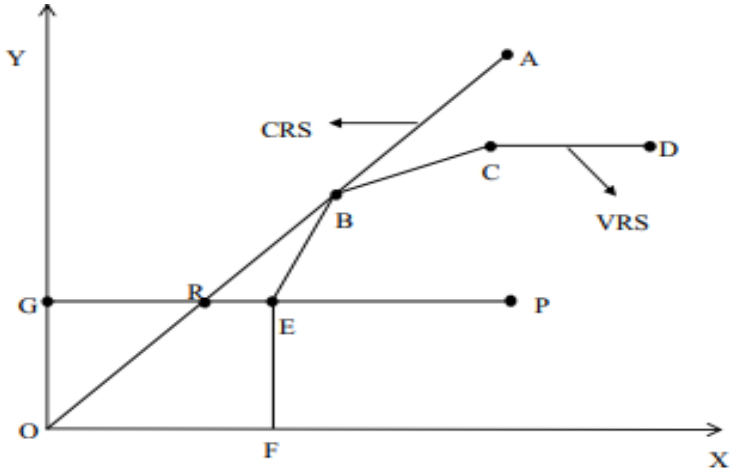
Allocative efficiency reflects the ability of a producer to use inputs in optimal proportions when their respective prices are known.

Economic efficiency requires producing given outputs at minimum cost, either using existing inputs to maximize revenue, or allocating inputs and outputs to maximize profits. profit.



Source: Theo Farrell (1957)

Figure 2.1: Graphs of Technical Efficiency, Allocative Efficiency and Cost Efficiency



Source: Theo Farrell (1957)

Figure 2.2: Graphs of Net Technical Efficiency, Scale Efficiency

2. 1.4 Methods of measuring the performance of commercial banks

2.1.4.1 Method of using ratios reflecting profitability

2.1.4.2 Marginal efficiency analysis method

2.1.5 Factors affecting the performance of commercial banks

2.1.6 Tobit regression model in evaluating technical efficiency from DEA

2.2 Research related to the research problem

2.2.1 Experimental study using ratio method

Foreign studies

Sufian and Chong (2008) used secondary data from financial statements to study banks in the Philippines from 1990-2005.

In 2011, Gul et al (2011) conducted a study with the 15 largest banks in Pakistan, the author used the data set for the period from 2005 to 2009 and macroeconomic indicators in the period. This.

Also in 2011, ACPIer and Anbar (2011) researched on the financial indicators of banks and macroeconomic indicators affecting the profitability of Turkish commercial banks as shown by ROA and ROE in the period 2002- 2010 includes 90 observations. The study used FEM and REM models, the results of Hausman test.

Domestic studies

Truong Quang Thong (2010) used the structure - behavior - performance model (SCP - Structure Conduct Performance) and multiple regression model to evaluate the factors affecting the performance of commercial banks. VN.

Research on factors affecting the performance of Vietnamese commercial banks by Trinh Quoc Trung and Nguyen Van Sang (2013)

using Tobit regression model for 39 Vietnamese commercial banks in the period 2005-2012.

Vo Xuan Vinh and Tran Thi Phuong Mai (2015) study the issue of income diversification affecting profitability and risk of Vietnamese commercial banks.

Tran Ngoc Tho and Nguyen Huu Tuan (2017) study and analyze the economic effects of the presence of foreign banks on domestic commercial banks in Vietnam.

2.2.2 Experimental study using marginal efficiency analysis method

Foreign studies

And in Latin American countries, Sanchez et al (2013) studied the factors affecting the performance of banks in the following countries: Argentina, Brazil, Chile, Columbia, Ecuador, Mexico, Venezuela in the period 1997. -2007.

In Tanzania, Raphael (2013) using the DEA model to estimate the efficiency of banks during the study period 2005-2008 shows that the level of non-economic efficiency is 13%, the level of non-economic efficiency is 9% and the level of non-economic efficiency is 9%. is 4%.

In Libya, Alrafadi et al (2014) studied the performance of economic efficiency, economic efficiency, and financial efficiency using the DEA method of 17 commercial banks in Libya in the period 2004-2010 and the Tobit regression method to analyze the factors. factors affecting the performance of these banks.

And in Tunisia, Ayadi (2014) analyzed the factors affecting the efficiency of resource use of commercial banks in Tunisia in the period 2000-2011, using regression method with panel data through FEM model. and REM, then use Hausman test to select the model.

Domestic studies

Nguyen Thi Loan and Tran Thi Ngoc Hanh (2013) analyzed the performance of Vietnamese commercial banks in the period 2007-2011.

Nguyen Thi Hong Vinh (2014) studies the relationship between bad debt and cost effectiveness of Vietnamese commercial banks in the period from 2007 to 2013.

Nguyen Minh Sang (2017) has shown that his research results are consistent with previous studies of Chronopoulos et al. (2011), Lee et al (2014). Diversifying activities will contribute to increasing revenue diversification, increasing the effective use of input resources, which will help increase the operational efficiency of Vietnamese commercial banks.

2.2.3 Research gap

The author finds the research gaps as a basis for expanding research in the future, as follows:

- First, most studies do not consider competition.
- Second, the results of previous research are mainly considered within countries and regions with economic characteristics that are not similar to Vietnam's, so it is difficult to apply and consider the similarities for commercial banks in Vietnam. . In addition, domestic studies are only limited to a certain extent, not yet comprehensive of Vietnam's commercial banks. As well as there are conflicting results between domestic and foreign studies.
- Thirdly, studies with little interest in revenue diversification will help banks maximize profits and expand their operations both horizontally and in depth.

CHAPTER 3: RESEARCH METHODS

3.1 Approach

3.2 Hypotheses and research models

3.2.1 Hypothesis

Table 3.1 Statistical table of research hypotheses	
Hypothesis	**Hypothetical content**
Hypothesis 1	There is a negative correlation between EOA and economic efficiency of Vietnamese commercial banks
Hypothesis 2	There is a positive correlation between LNA and economic efficiency of Vietnamese commercial banks
Hypothesis 3	There is a positive correlation between LOA and economic efficiency of Vietnamese commercial banks
Hypothesis 4	There is a negative correlation between DOL and economic efficiency of Vietnamese commercial banks
Hypothesis 5	There is a negative correlation between NPL and economic efficiency of Vietnamese commercial banks
Hypothesis 6	There is a negative correlation between STAFF and economic efficiency of Vietnamese commercial banks
Hypothesis 7	There is a negative correlation between SO and economic efficiency of commercial banks in Vietnam
Hypothesis 8	There is a positive correlation between AGE and economic efficiency of Vietnamese commercial banks
Hypothesis 9	There is a positive correlation between NET and economic efficiency of Vietnamese commercial banks
Hypothesis 10	There is a negative correlation between FM and economic efficiency of commercial banks in Vietnam
Hypothesis 11	There is a positive correlation between HHI and economic efficiency of Vietnamese commercial banks
Hypothesis 12	There is a positive correlation between MS and the economic efficiency of Vietnamese commercial banks
Hypothesis 13	There is a positive correlation between GDP and economic efficiency of Vietnamese commercial banks
Hypothesis 14	There is a negative correlation between CPI and economic efficiency of commercial banks in Vietnam

3.2.2 Proposed research model

The author chooses a combination method between asset approach and operating costs to select input and output factors that reflect the multi-dimensional technical efficiency of commercial banks, including:

- Input variable:
    - Employee Costs (CPNV)
    - Non-interest expenses (CPNL)
    - Total assets (LNA)
    - Number of branches (ML)
- Output variable:
    - Non-interest income (TNNL)
    - Total Loans (LOA)

Tobit regression model

Research model to evaluate the economic efficiency of Vietnamese commercial banks is as follows:

$$\mathbf{HQKT}_{i,t} = \alpha + \beta \mathbf{NT}_{i,t} + \mathbf{TT}_{i,t} + \mathbf{VM}_{i,t} + \varepsilon_{i,t}$$

In there:

- $HQKT_{i,t}$ is a dependent variable with representative variables being economic efficiency, economic efficiency, and financial efficiency of bank i in year t.
- $NT_{i,t}$ is the internal independent variable of bank i in year t with the representative variables being EOA, LNA, LOA, DOL, NPL, SO, STAFF, AGE, NET of bank i in year t.
- $TT_{i,t}$ is the independent variable on market competition of bank i in year t with the representative variables being HHI, FM and MS of bank i in year t.

- $VM_{i,t}$ is the independent variable of macroeconomic factors (GDP and CPI) affecting the economic efficiency of bank i in year t.
- α is the intercept factor.
- β, μ and γ are estimated parameters.
- ε is the random error.

From the above general model, the study presents 03 specific research regression models as follows:

Model 1:

$$\mathbf{HQKT_{i,t} = \alpha + \beta NT_{i,t} + TT_{i,t} + VM_{i,t} + _{i,t}}$$

Model 2:

$$\mathbf{HQKTT_{i,t} = \alpha + \beta NT_{i,t} + TT_{i,t} + VM_{i,t} + _{i,t}}$$

Model 3:

$$\mathbf{HQQM_{i,t} = \alpha + \beta NT_{i,t} + TT_{i,t} + VM_{i,t} + _{i,t}}$$

3.3 Methods of data collection

3. 4 Data processing methods

CHAPTER 4: RESEARCH RESULTS AND DISCUSSION

4.1 Current status of business activities of commercial banks in Vietnam

4.2 Descriptive statistics of variables

4.2.1 Descriptive statistics of variables according to data envelope analysis method DEA

4.2.2 Descriptive statistics of variables according to Tobit regression model

Table 4.9 Descriptive statistics of Tobit . regression model variables

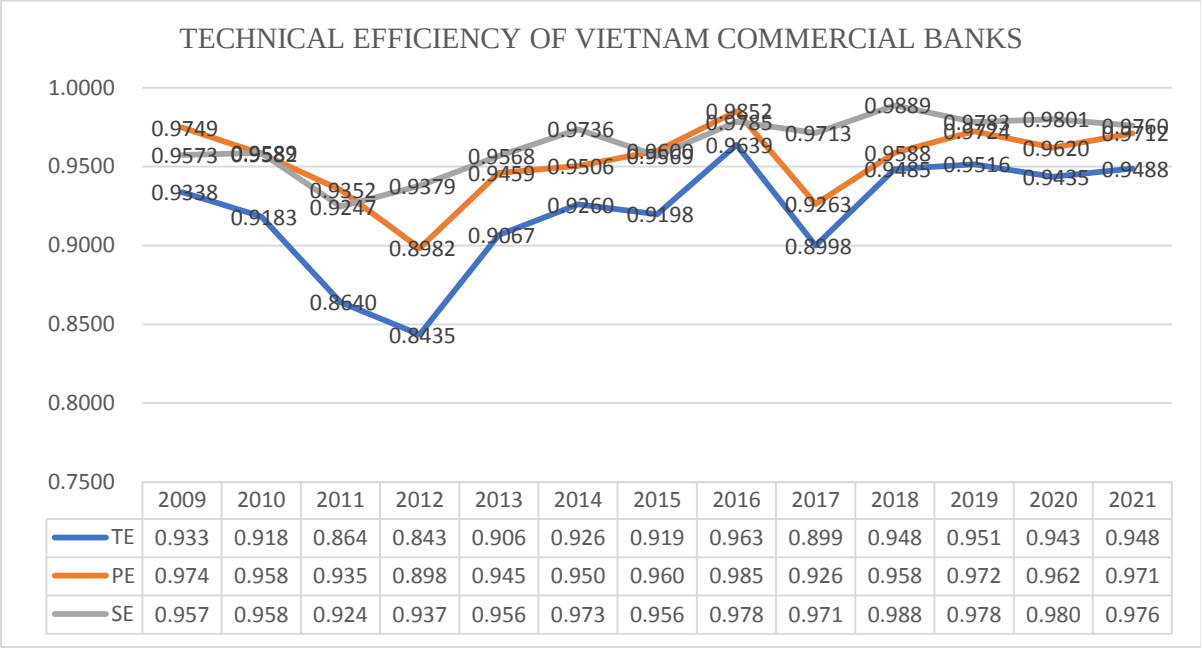
Variable	Number of observations	Medium	Standard deviation	The shortest	Tallest
LNA	286	18.4939	1.2124	15.8275	21,122
EOA	286	0.0924	0.0419	0.0293	0.2554
LOA	286	0.5836	0.1299	0.1721	0.8164
DOL	286	1.6206	0.5122	0.9431	5.1501
NPL	286	0.0238	0.0218	0	0.279
STAFF	286	7.755	8,677	411	39,950
NET	286	352	481	17	2.305
AGE	286	23.3077	10.8633	2	63
SO	286	0.1538	0.3614	0	first
FM	286	0.1069	0.0110	0.0867	0.1263
HHI	286	-0.5975	14.6909	-248.1571	0.4999
MS	286	0.0385	0.0443	0.0022	0.2188
GDP	286	0.0616	0.0064	0.0525	0.0708
CPI	286	0.0675	0.0597	0.0063	0.189

The author extracts from descriptive statistics on Excel according to audited financial statements of Vietnamese commercial banks

4.3 Research results and discussion

4.3.1 Determination of technical efficiency

Figure 4.1 Technical efficiency DEA model results for Vietnamese commercial banks



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
TE	0.933	0.918	0.864	0.843	0.906	0.926	0.919	0.963	0.899	0.948	0.951	0.943	0.948
PE	0.974	0.958	0.935	0.898	0.945	0.950	0.960	0.985	0.926	0.958	0.972	0.962	0.971
SE	0.957	0.958	0.924	0.937	0.956	0.973	0.956	0.978	0.971	0.988	0.978	0.980	0.976

The author extracts from DEAP results 2.1 Technical efficiency of commercial banks in Vietnam

4.3.1.1 Technical Efficiency - TE_{CRS}

4.3.1.2 PE Net Technical Efficiency (TE_{VRS})

4.3.1.3 Efficiency of scale – SE

4.3.1.4 Distribution of technical efficiency and scale efficiency

4.3.1.5 Technical efficiency according to CRS – DRS – IRS

4.3.1.6 Total Factor Productivity TFP - Malmquist Index

Table 4.15 Malmquist Index Results

	TFPCH	EFCH	TECHCH	PECH	SECH
2010	1.1369	0.9919	1.1522	0.9858	1.0052
2011	0.7789	0.9468	0.8221	0.9797	0.9685
2012	1.1559	0.9911	1.1724	0.9661	1.0374
2013	1.0846	1.1114	0.9681	1.0681	1.0317
2014	1.0230	1.0389	0.9771	1.0140	1.0231
2015	0.9804	0.9979	0.9757	1.0141	0.9838
2016	1.1371	1.0634	1.0674	1.0338	1.0273
2017	1.0743	0.9354	1.1553	0.9410	0.9938
2018	1.0886	1.0765	1.0129	1.0547	1.0207
2019	1.0470	1.0057	1.0374	1.0161	0.9893
2020	0.9845	0.9928	0.9927	0.9928	0.9999
2021	1.0657	1.0079	1.0558	1.0127	0.9954
Medium	**1.0464**	**1.0133**	**1.0324**	**1.0066**	**1.0063**

The author extracts from DEAP results 2.1 Technical efficiency of commercial banks in Vietnam

4.3.2 Factors affecting technical efficiency

4.3.2.1 Testing of variables

Before considering the research results of the Tobit regression model for the dependent variables in the model, which are TE - PE - SE, we see that the results of the correlation matrix of the independent variables

show that most of them are valid. less than 0.8. Except for the following pairs of variables that are highly correlated with each other:

- The variable STAFF has a positive correlation with LNA, NET and MS quite high 0.8048, 0.8478 and 0.8683.
- The DOL and LOA variables are negatively correlated and the correlation is -0.8869 (>0.8).
- MS variable is positively correlated with SO variables with a correlation of 0.9257.

As the analysis says, MS and STAFF, after being removed from the model, have yielded much better VIF test results. The average VIF has decreased from 6.14 to 3.21, the other independent variables are all < 7. Thus, we decided to remove 2 variables MS and STAFF from the model and perform the regression step. tobit rules.

4.3.2.2 Tobit regression model TE – PE – SE

Tobit regression results for the independent variables with the dependent variable being the technical efficiency of TE - PE - SE, we get the results that the statistical value of the model is significant at 1% level for all 3 dependent variables. . The results also show that the Tobit regression model for two variables TE - PE gives quite similar results with the independent variables having statistical significance at 1%-5%-10% including 6 independent variables. Setup: LNA, LOA, NET, SO, AGE and HHI. But with the dependent variable SE, the model only results in 3 independent variables: EOA, LOA and HHI have statistical significance at 1%-5%-10%.

Independent variables: EOA, DOL, NPL, FM, GDP are negatively correlated with technical efficiency of commercial banks but not statistically significant in the model. Independent variable: CPI has a

positive correlation with technical efficiency of commercial banks and has no statistical significance in the model.

Independent variables: DOL, EOA and CPI have a positive correlation with the net technical efficiency of commercial banks but are not statistically significant in the model. Independent variables: NPL, FM and GDP are negatively correlated with the net technical efficiency of commercial banks and have no statistical significance in the model.

Independent variables: LNA and CPI have a positive correlation with the scale efficiency of commercial banks but are not statistically significant in the model. Independent variables: DOL, NPL, NET, AGE, SO, FM and GDP are negatively correlated with the scale efficiency of commercial banks and have no statistical significance in the model.

Table 4.20 Results of regression model TE - PE - SE						
Variable	**TE**		**PE**		**SE**	
	Value	**Expectation mark/Model mark**	**Value**	**Expectation mark/Model mark**	**Value**	**Expectation mark/Model mark**
LNA	0.0302***	+/+	0.0305***	+/+	0.0107	+/+
EOA	-0.2663	-/-	0.2292	-/+	-0.4474***	-/-
LOA	0.693***	+/+	0.443***	+/+	0.26***	+/+
DOL	0.0182	-/+	0.0176	-/+	-0.0081	-/-
NPL	-0.3043	-/-	-0.2083	-/-	-0.1182	-/-
NET	-0.0001***	+/-	-0.0002***	+/-	-0.0000	+/-
AGE	-0.0047***	+/-	-0.0044***	+/-	-0.0009	+/-
SO	0.125**	-/+	0.1625***	-/+	-0.0211	-/-
FM	-0.7446	-/-	-0.2966	-/-	-0.4982	-/-
HHI	0.0943***	+/+	-0.0505*	+/-	0.05**	+/+
GDP	-0.1737	+/-	-0.0536	+/-	-0.0575	+/-
CPI	0.1085	-/+	0.0631	-/+	0.0719	-/+
_cons	0.1515		0.2215		0.7361	

, ** and * at the 10%, 5%, and 1% statistical significance levels, respectively.*
Extract the results of data processing from STATA 16.0.

CHAPTER 5: CONCLUSIONS AND POLICY IMPLICATIONS ONLY

5.1 Conclusion of the study

The results of the study by the DEA method gave results that were relatively consistent with the actual business activities of 26 commercial banks during the research period. Most banks have achieved quite high performance and tend to change for the better. The growing scale of operations and the technical efficiency also gradually improved significantly. Although the pure technical efficiency is high, the scale efficiency is higher, contributing much to the bank's business performance. Banks tend to change technologically more and more strongly, this change makes a great contribution to improving productivity and improving business performance over the years.

With the advantage of business scale, state-owned commercial banks have shown that scale efficiency has significantly improved their business performance compared to joint stock commercial banks. However, the scale development must be strictly controlled. If not properly calculated and control operating costs well, the increase in scale will increase costs and reduce the efficiency of the bank's business operations. Particularly for the group of Joint Stock Commercial Banks, the expansion of operation scale will create conditions to increase operational efficiency.

The TFP composite factor productivity index from the Malmquist index results clearly shows that banks have improved and increased productivity in business activities. The main contribution to TFP is through changing technical efficiency and changing technological progress. This shows that banks need to continue to improve further in cost management and operation management, but apply technological advances through

changing management technology and banking technology. The operation and exploitation of the maximum benefits and utilities from technology will greatly contribute to reducing costs, developing new products and services to increase competition - increasing the utility of using products and services. services from customers, thereby increasing income through service activities, trading activities and lending.

In the scope of the study, we see that banks are still simply using a lot of cost resources in business activities. However, research results have shown that banks can quickly apply technological advances to reduce operating costs in a reasonable way to increase business efficiency.

Table 5.1 Statistics of Tobit regression model results

Variable	TE	PE	SE
LNA	0.0302***	0.0305***	0.0107
EOA	-0.2663	0.2292	-0.4474***
LOA	0.693***	0.443***	0.26***
DOL	0.0182	0.0176	-0.0081
NPL	-0.3043	-0.2083	-0.1182
NET	-0.0001***	-0.0002***	0
AGE	-0.0047***	-0.0044***	-0.0009
SO	0.125**	0.1625***	-0.0211
FM	-0.7446	-0.2966	-0.4982
HHI	0.0943***	-0.0505*	0.05**
GDP	-0.1737	-0.0536	-0.0575
CPI	0.1085	0.0631	0.0719
_cons	0.1515	0.2215	0.7361

. ** and * are at the 10% statistical significance level, respectively. 5% and 1%*

Extract table data processing results from STATA 16.0

5.2 Policy implications

5.2.1 Policy implications for state managers, policy makers

Firstly , although the research results show that the larger the operating network of commercial banks, the lower the operating efficiency. But this may be true for commercial banks that have large networks but have not yet optimized their operations. In terms of most other commercial banks, the network size is low, with the characteristics of Vietnamese commercial banks growing in size, but currently being bound to develop the network operating on the scale of equity. The State Bank of Vietnam needs to develop more flexible policies on mandatory regulations in expanding the operating network - transaction network for commercial banks that meet the conditions of financial quality. go up. In case commercial banks meet the above basic requirements, the SBV allows banks to expand their transaction points, which can be in the form of traditional transaction points or automatic transaction points with current high-tech equipment. grand. Priority will be given to commercial banks to innovate technology to expand transaction networks with smart machine systems with customers, especially in big cities of Vietnam.

Second , the research results show that lending in total assets has statistical significance and has a high impact on the performance of commercial banks. In fact, lending activities still play an important role and contribute most of the income of commercial banks. According to the regulations, commercial banks are only allowed to lend a large part of the total capital after making deductions to ensure the liquidity ratio . capital adequacy and reserve requirements. Most of this required reserve is currently in an unprofitable state. This invisibility is reducing the operational efficiency of commercial banks when they cannot exploit this asset into a profitable asset status. It is really necessary to make a flexible

open policy in this case. The SBV can use the open market channel for commercial banks to replace compulsory reserves into a profitable form that still has high liquidity such as bills, government bonds, investment deposits, etc. In case of need for payment. From the required reserve, commercial banks can resell these bills and bonds to get cash to meet operational needs. This can optimize cash flow, profitable assets are brought into the economy through lending to continue to create maximum capital efficiency.

Third , build clear and open legal frameworks in building more non-credit operations to increase efficiency for commercial banks. Typically, derivative transactions are similar to the international financial market. Currently, the market for exchange rate derivatives, commodities , etc. is active and diversified in the financial markets of developed and emerging countries such as Vietnam. These activities bring quite good business results to the banks involved in providing products. In addition to increasing effective operations for commercial banks, this is also a way to expand Vietnam's financial services to the world as well as bring more types of financial services to customers. inland. Diversifying income sources will help commercial banks to spread operational risks into many segments and thereby have resources to compensate for other inefficient activities or credit risks when the market has bad movements, making it difficult for commercial banks to operate. increase in bad debt.

Fourth , the general situation is that commercial banks are operating on the basis of different information technology systems with core-banking systems with a modern level corresponding to the ability to invest initial capital. However, the level of modernization and development of information technology is increasingly fast and complex, so the safety of

the banking system needs to be given due attention. In recent years, a series of organizations/individuals have used high technology to perform intrusions to steal information, steal accounts, and steal customers' money. sophisticated method. Commercial banking activities are associated with large deposits of customers, so to ensure account safety requires a modern information technology system and high anti-intrusion. The SBV should be concerned about the introduction of minimum regulations periodically according to each stage of information technology development. In which, it clearly stipulates the mandatory safety requirements, the minimum criteria for building and upgrading a core-banking system to meet the increased level of transactions, diversified and safe products and services. This mandatory minimum requirement is to ensure the service quality of the entire commercial banking system, the quality of customers' transactions, enhance the modern financial experience environment of Vietnam and minimize security risks. the whole system of commercial banks in Vietnam. Thereby also contributing to improving the image, brand and people's trust in the operation of commercial banks in Vietnam. At the same time, it contributes to minimizing cybercrime causing damage to commercial banks in the increasingly modern and complex high-tech era 4.0.

5.2.2 Governance Implications for Vietnamese Commercial Banks

Firstly , the operation of commercial banks is associated with continuous and substantial scale growth. Build a business strategy in the direction of maximizing internal strengths. Especially, reorganizing the operating apparatus to optimize costs. Develop a policy to centralize transaction activities instead of organizing many departments/departments/departments with overlapping functions leading to reduced labor productivity. Building specialized business centers to handle

internal transactions by region/domain. gradually abolish the model of distributed business support department in business units.

Second , the network is also an important channel to expand the scope of activities and increase the number of customers coming to commercial banks. In recent years, there has been an explosion in the transaction network of large commercial banks with potential assets, which has promoted the expansion of the transaction network throughout the country. When transferring basic transactions to the automated service system, commercial banks will reduce the transaction volume - freeing up transaction staff time to perform other profitable operations, reducing costs. operate regularly.

Thirdly , with the increasing competition in service activities, commercial banks with core banking systems that have been innovated in the past 5 years have had great changes in increasing operational efficiency through technical and technological improvement to meet business needs. The modern and advanced information technology system helps commercial banks to optimize complex operations that previously had to maintain a staff of service personnel as well as develop new products and services. transaction quality.…

Fourth , the diversification of income from non-credit activities has shown an increasing contribution to the operational efficiency of Vietnamese commercial banks. Modern financial products and services are an important business channel in the business strategy of commercial banks in the new era. The trend of shifting focus to retail activities at Vietnamese commercial banks has brought many positive highlights not only domestically and internationally.

Fifth, through the covid-19 pandemic crisis, different industries and sectors have had different developments. like the retail sector. Real estate was heavily affected, but the medical and logistics sectors still had high growth,... Building business strategies associated with the development of each key and strong field.

5.3 Limitations of the study and directions for further research

This study considers the period of Covid-19 pandemic events taking place from 2020-2021, so in the coming time, it will expand to evaluate and compare the operational efficiency of Vietnamese commercial banks in the period after the extension. strongly due to Vietnam's Covid-19 pandemic. In addition, this study can expand and deepen the assessment of the impact of factors affecting the technical efficiency of commercial banks when considering more **aspects** of competition in the financial industry (e.g., commercial enterprises). Fintech), the level of technology improvement or the growth rate of some fields - key industries - leading - spearheads to the efficiency of Vietnamese commercial banks.

LIST OF WORKS OF THE AUTHOR

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