EVALUATION OF THE BUSINESS EFFICIENCY OF COMMERCIAL BANKS

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Abstract

This study aims to evaluate the impact of the COVID-19 pandemic on the business efficiency of 15 listed commercial banks in Vietnam, from 2016–2023. We use qualitative analysis methods and T-test models in SPSS software to compare the efficiency of indicators before and after COVID-19. Research results have shown that the operating picture of the banking industry has a rare bright spot when the business efficiency of the entire banking industry has grown, in which state-owned commercial banks have a significant gap with the group of private commercial banks, thanks to better total asset size and risk buffer. The authors find that the Joint Stock Commercial Bank for Foreign Trade of Vietnam (VCB) is the state-owned bank with the most stable and best performance in the research sample and observation period, while the Military Commercial Joint Stock Bank (MBB) is the best private bank. In the post-COVID-19 period, from 2021–2023, the business performance of commercial banks in Vietnam has grown in return on equity (ROE), net interest income (NII), and profit after tax (PAT). At the same time, capital adequacy ratio (CAR) has no difference, showing that the financial safety level of commercial banks remains stable. Thereby, the authors propose four solutions to commercial banks and recommend four policy implications to the management agency.

Keywords: Efficiency, Return, Profit, Banks, Return on Equity, Return on Asset, Capital Adequacy Ratio, Vietnam, COVID-19

1. INTRODUCTION

When a company performs well, it gains a competitive edge for both the company and the country (Aljaman et al., 2023). Efficiency has long been recognized as a crucial indicator of business performance, especially during economic uncertainty. More efficient banks are expected to tend to get optimal profits, more loan funds, and provide better service to their customers (Ikhwan et al., 2023). The COVID-19 pandemic has heightened the need for businesses to optimize their operations, particularly in the financial sector. Rose (2013) highlights that efficiency is critical in

ensuring resilience during market disruptions, such as those caused by the pandemic. Efficiency is measured by financial or nonfinancial metrics, used in different tiers of the business to measure success in achieving objectives, critical success factors, strategies, and plans — planning (Otley, 1999). Business efficiency measurement aims to meet stakeholder expectations through quantifiable results (Banker et al., 2000). Especially in the banking sector, with the pivotal role of the economy, especially in the context of Vietnam's more profound and broader regional and worldwide integration. Besides development opportunities, the integration process puts the Vietnamese banking system in front of many difficulties and challenges. With low financial capacity, limited risk management capacity, and technology level, Vietnamese commercial banks face fierce competition from multinational economic groups, financial technology (FinTech) companies, mobile network operators (MNOs), etc.

Numerous risks stemming from the COVID-19 pandemic directly or indirectly affect businesses across various sectors, including operational shutdowns, supply chain disruptions, labor shortages, and changes in consumer behavior (Chang & Chiu, 2006; Denizer et al., 2007). The widespread impact of the pandemic has led to significant economic challenges, particularly for the financial sector. Consequently, there has been increasing interest in assessing the extent of firms' exposure to pandemic-related risks and exploring effective strategies for managing them (Wood, 2006; Halabi et al., 2010; Hu et al., 2006).

The above case studies show that the COVID-19 pandemic has had a severe negative impact on key financial indicators of commercial banks worldwide (World Bank, 2022). The main factors influencing this include interest rate cuts, an increase in non-performing loans, a reduction in credit demand, and higher provisions for credit losses (Financial Stability Board [FSB], 2020). These factors have led to a significant decline in banks' profitability due to a sharp decrease in net interest income (NII), which in turn has led to a drop in return on equity (ROE) and return on total assets (ROA) of banks in the US, Europe, and Asia. At the same time, the increase in non-performing loans and credit loss provisions has also put the capital adequacy ratio (CAR) of the banking system at risk, affecting the financial stability of the sector (World Bank, 2022). However, banks in various countries have managed to maintain profitability primarily due to rescue and financial support policies, as well as interest rate cuts and regulatory easing from central banks (World Bank, 2022). Banks in developed economies such as the US, EU, and Japan often have robust financial systems and are supported by government financial policies, therefore, they benefited from aggressive monetary easing and fiscal stimulus to stabilize operations. However, banks in developing countries face more difficulties in maintaining liquidity and credit growth. Unlike global banks that had diversified portfolios and robust capital markets, Vietnamese banks relied heavily on traditional lending, leaving them more exposed to pandemic-related shocks. Weaker economies have faced a sharp decline in loan demand and the ability of clients to repay debt (EIU, 2021; FSB, 2020; World Bank, 2022). In addition, banks in emerging markets like Vietnam faced greater structural and operational constraints. Furthermore, Vietnam's banking sector had to navigate these challenges while implementing international standards such as Basel II and digital transformation under limited resources. According to the assessment of prestigious international organizations such as the World Bank and the International Monetary Fund (IMF). The operational efficiency of Vietnam's commercial banking system is still poor compared to commercial banks in the world. Nevertheless, Vietnam's relatively stable macroeconomic environment and swift government response created unique opportunities for domestic banks to recover faster compared to some peers in ASEAN or South Asia.

The COVID-19 pandemic not only posed significant financial stress but also reshaped operational strategies. Vietnamese banks had to accelerate digitization, adopt remote working policies, and reassess credit risk strategies. These strategic shifts mirror global trends in enhancing operational resilience, but also highlight Vietnam's context-specific adaptation and performance resilience in post-pandemic recovery. The COVID-19 epidemic also changed how the unit is organized and operated, the supply operations to customers, and new opportunities and challenges affecting the entity's business and profit contribution structure.

In the context that there has not been much research in Vietnam during the COVID-19 pandemic, analyzing the efficiency of business activities of the banking system in general and the listed commercial banks in Vietnam is critical.

Although there are many domestic and foreign studies evaluating the business performance of commercial banks through financial indicators (such as ROE, ROA, NII, CAR) as well as applying quantitative models (data envelopment analysis [DEA], stochastic frontier analysis [SFA], extended production function) in the period before COVID-19, there is still an important gap in the references related to the impact of the pandemic as well as the transformation process of the Vietnamese banking industry after the pandemic.

This study is structured as follows. The existing literature is reviewed in Section 2. The research method is detailed in Section 3. The results of the study evaluating the business efficiency of commercial banks are presented in Section 4. Discussion and some proposed solutions to help improve the business efficiency of commercial banks in general in the future are described in Section 5. The conclusion with the results of the study of 15 commercial banks in the period 2016–2023 is provided in Section 6.

2. LITERATURE REVIEW

When evaluating the business efficiency of commercial banks, studies often focus on measuring through two main groups of indicators: financial indicators and nonfinancial indicators.

Firstly, regarding economic indicators, the primary indicators mentioned include:

• Indicators reflecting profits such as profit before tax, profit after tax (PAT), and profit margin (Chang & Chiu, 2006; Gul et al., 2011). Generally, the higher a bank's profits, the more its business efficiency develops.

• Indicators reflecting profitability ratios such as ROE, ROA, and return on investment (ROI)

(Bhattacharyya et al., 1997; Pasiouras & Kosmidou, 2007; Gul et al., 2011). Research shows that ROA, ROE, and ROI are directly proportional to the bank's business efficiency, and the higher these indicators are, the better the bank's profitability from capital and assets. In addition, for banks, due to the specific nature of the money lending business, it is one of the main activities of the bank, so the next group of financial indicators that are also frequently used are (Hussain et al., 2024; Malik, 2023).

- Indicators reflecting capital adequacy, CAR, and lousy debt ratio; risk provisioning ratio (Bandaranayake & Jayasinghe, 2014; Chang & Chiu, 2006). Banks usually only aim for a CAR index that meets the central bank's regulations because the more significant the CAR, the more effective it is. Meanwhile, the lower the bad debt/total outstanding debt ratio and the higher the bad debt coverage provision ratio, the more sustainably the bank's operations will develop in the long term, and the better the buffer will be. Prevent risks from arising. Some other indicators can also be used to evaluate a bank's business efficiency, such as cost efficiency, technical efficiency, and allocative efficiency (Chang & Chiu, 2006), labor productivity, and macro factors, such as GDP and inflation (Gul et al., 2011).

Research can apply qualitative methods to measure and analyze indicators or use quantitative methods through experiments using different models, such as DEA (Chang & Chiu, 2006; Ferrier & Lovell, 1990), SFA (Ferrier & Lovell, 1990; Bhattacharyya et al., 1997), the pooled ordinary least squares (POLS) regression model (Gul et al., 2011), and Tobit regression model (Pasiouras & Kosmidou, 2007).

Secondly, nonfinancial indicators. Besides the financial factors mentioned above that are used to evaluate a bank's business efficiency, nonfinancial elements can also be used to assess the bank's position. Valuable and widely used indicators are: 1) brand value (BRA); 2) corporate social responsibility (CSR); 3) customer experience and satisfaction; 4) level of information technology development; and 5) digital maturity level. For nonfinancial indicators, the analytical approach is mainly carried out by testing factors affecting business efficiency, with independent variables being financial indicators. Research results show that the more brand value, social responsibility, customer experience, information technology development level, or digital maturity level of a bank increases, the higher the bank will be.

Thus, the publications of other authors in Vietnam are mainly researched in the pre-COVID-19 period, with various criteria groups depending on the authors' ability to collect data and measure. International publications show no studies by foreign authors evaluating the business efficiency of commercial banks in Vietnam. The studies also mainly focus on the pre-COVID-19 period. This is also the space for this study to perform and compare the two periods, inheriting the previous research of the authors' team and continuing to study the other financial indicators. The following research questions are currently unanswered:

RQ1: What was the business efficiency of Vietnamese commercial banks before and after COVID-19?

RQ2: What are the implications for recommendations for Vietnamese commercial banks to improve business efficiency in the coming time?

Therefore, we will focus on the gaps in investigations to evaluate the effectiveness of the two periods before and after COVID-19, and simultaneously inherit and apply selected fundamental financial indicators to assess. Business efficiency of listed commercial banks in Vietnam in the period 2016–2023, in the main criteria are: 1) ROE; 2) ROA; 3) NII, and growth rate of NII; 4) PAT; and 5) minimum CAR. The results of this research are the scientific basis for assessing banks' business operations in the post-COVID-19 period, thereby proposing solutions to enhance their operational efficiency in the future.

3. RESEARCH METHODOLOGY

3.1. Research methods

The authors use a combination of qualitative and quantitative research methods. Qualitative research uses technical processes such as analysis and synthesis, descriptive and comparative statistical methods, and logical reasoning. The authors also performed group comparisons using the T-test model in SPSS to evaluate the difference in bank business performance before and after COVID-19.

Research process and steps:

1. *Step 1*: Select the research and overview.

- Research sample: The authors will select 15 commercial banks currently listed on Vietnam's stock market for research (see Appendix).

- Research period: Pre-COVID-19 from 2016 to 2018 and post-COVID-19 from 2021 to 2023 COVID-19. The total number of observations in the study is 90:45 observations for pre-COVID-19 and 45 observations for post-COVID-19.

2. *Step 2*: Collect the original data. Secondary data is collected from financial statements obtained from websites about banking and finance (for example, CafeF — https://cafef.vn, State Bank of Vietnam [SBV] — https://sbv.gov.vn, FiinTrade — https://fiintrade.vn) and the official website of commercial banks. With the average of each report sample in the range of 30–40 indicators, the total number of original reports collected is: 30–40 indicators, three reports, 90 observations.

3. *Step 3*: Calculate all secondary financial indicators for each year of each observed sample research using SPSS software to support and serve calculations.

4. *Step 4*: Compare, evaluate, and synthesize to distill and select the best essential criteria.

5. *Step 5*: Analyze indicators by a) time and b) compare with other banks to evaluate, analyze, and show research results.

Table 1. List of joint stock commercial banks and total assets

Bank	2016	2017	2018	2021	2022	2023
ABB	67,465	64,375	74,172	102,600	116,400	120,900
ACB	179,600	201,500	233,700	383,500	444,500	527,800
BID	650,300	850,700	1,006,000	1,490,000	1,517,000	1,762,000
BVB	25,783	29,019	32,385	51,809	61,102	76,511
CTG	661,200	779,500	948,600	1,241,000	1,341,000	1,532,000
MBB	200,500	221,000	256,300	411,500	495,000	607,100
MSB	104,400	104,300	92,606	157,000	176,700	203,700
OCB	39,095	49,447	63,815	118,200	152,500	184,500
SHB	169,000	204,700	233,900	365,300	412,700	506,600
STB	189,800	292,000	332,000	453,600	492,500	521,100
TCB	175,900	192,000	235,400	383,700	439,600	568,700
TPB	51,478	76,221	105,800	164,400	206,300	292,800
VCB	577,000	674,400	787,900	1,223,000	1,326,000	1,415,000
VIB	80,661	84,309	104,500	184,500	244,700	309,500
VPB	163,200	193,900	228,800	377,200	419,000	547,400
Total	3,335,381	4,017,371	4,735,877	7,107,309	7,845,002	9,175,611

Note: Unit–billion VND. The list of full names of banks is presented in the Appendix.
Source: Authors' elaboration based on the FiinTrade database.

Figure 1. Total assets of 15 listed commercial banks in Vietnam
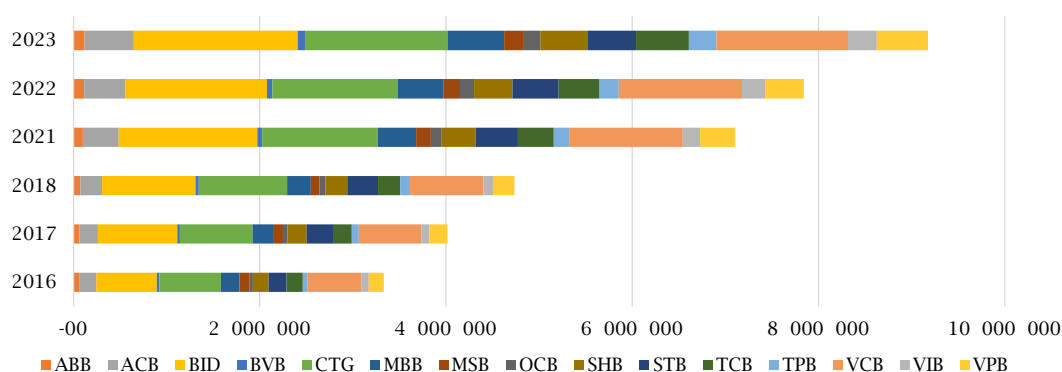
Note: Unit–billion VND.
Source: Authors' elaboration based on the FiinTrade database.

3.2. Indicators

The study highlights the following indicators:

• *ROE (Profit after tax / Average equity). ROE* reflects a bank's ability to earn a net profit per dollar of equity. A high *ROE* is good, showing the bank's ability to generate a high *ROE* or, in other words, offering optimization in using equity-bank ownership (Bhattacharyya et al., 1997; Pasiouras & Kosmidou, 2007; Gul et al., 2011). According to international practice, *ROE* ≥ 12%–15% is considered good.

• *ROA (Profit after tax / Average total assets).* The *ROA* ratio shows how much after-tax profit is generated from a dollar of purchases. The larger the *ROA* result, the better the ability to generate income from the bank's assets, and the better the business efficiency and vice versa (Bhattacharyya et al., 1997; Pasiouras & Kosmidou, 2007; Gul et al., 2011). CAMEL shows banks are most effective when *ROA* is ≥ 1.5%.

• *NII and the growth rate of NII.* The bank's net income includes net interest, net profit (loss) from operations, capital contribution, and share purchase income. Net income growth rate reflects a bank's revenue growth rate over the years, showing whether the bank is operating efficiently or not. Most calculated indicators are taken from the bank's financial reporting system information. For banks, with the monetary function, *NII* accounts for a significant proportion of the total net income of

the unit (Hussain et al., 2024; Malik, 2023; Pasiouras & Kosmidou, 2007; Gul et al., 2011). Thus, this study will focus on *NII* and growth rate.

• *PAT (Total revenue – Total expenses – Tax). PAT* is an indicator that determines the overall business efficiency of commercial banks. The higher the difference between total revenue and total costs, with the prescribed corporate income tax rate, the higher the unit's *PAT* and vice versa (Hussain et al., 2024; Malik, 2023; Pasiouras & Kosmidou, 2007; Gul et al., 2011). Therefore, the revenue-cost structure is essential in determining the unit's profit. At the same time, *PAT* is also a numerical component in financial indicators measuring the business efficiency of commercial banks, namely *ROE* and *ROA*, thereby affecting these economic indicators in the same direction. Therefore, *PAT* is the primary financial indicator used in the analysis of the business efficiency of commercial banks.

• Minimum capital adequacy ratio (*CAR*). *CAR* is the basis used to measure the capital adequacy of a bank; *CAR* reflects the level of soundness and "health" of a bank to ensure that banks can withstand the level of losses from operating losses. The *CAR* shows the bank's intrinsic strength to withstand losses in times of crisis. The Basel Committee recommends that banks maintain a minimum *CAR* to control the stability and efficiency of the financial system. For the minimum *CAR,* Basel recommends is not less than 8%.

4. RESEARCH RESULTS

4.1. Descriptive statistics

Before conducting inferential analysis, descriptive statistics were compiled to provide a general overview of the dataset and the underlying distribution of key indicators. Table 2 below summarizes the minimum, maximum, mean, and standard deviation for the main performance metrics of the 15 listed banks during the entire period (2016–2023).

Table 2. Descriptive statistics

Variable	Min	Max	Mean	Std. dev.
ROE (%)	0.4	30.33	17.18	6.57
ROA (%)	0.01	3.65	1.48	0.62
PAT (billion VND)	3	21.919	6.931	5.892
NII (billion VND)	550	46.823	12.378	10.402
CAR (%)	8.4	14.2	12.86	1.64

Source: Authors' elaboration.

The descriptive statistics indicate a considerable disparity in the performance of Vietnamese commercial banks during the study period. The average *ROE* was 17.18% and *ROA* was 1.48%, suggesting relatively strong but uneven profitability across banks. High standard deviations in *PAT* and *NII* reveal significant differences in business scale and efficiency between large and smaller banks. Meanwhile, the average *CAR* stood at 12.86%, exceeding the Basel II minimum requirement, reflecting strong and stable capital resilience across the system. Overall, the banking sector maintained operational efficiency despite clear variations among different bank groups.

4.2. Profit after tax

Research results show that the *PAT* of commercial banks in both the pre- and post-COVID-19 period has a positive *PAT* and tends to increase over the years at 15/15 commercial banks in the research sample.

Table 3. Results for profit after tax (*PAT*)

Bank code	Index	2016	2017	2018	Average before COVID-19	2021	2022	2023	Average after COVID-19
ABB	PAT	244	489	715	483	1.001	1.118	1.560	1.226
	Growth	167%	100%	46%	105%	40%	12%	40%	30%
ACB	PAT	1.325	2.118	5.137	2.860	6.010	7.683	9.603	7.765
	Growth	29%	60%	143%	77%	17%	28%	25%	23%
CTG	PAT	6.838	7.432	5.275	6.515	9.461	13.694	14.089	12.415
	Growth	20%	9%	-29%	0%	79%	45%	3%	42%
BID	PAT	6.138	6.787	7.358	6.761	8.368	6.997	10.540	8.635
	Growth	5%	11%	8%	8%	14%	-16%	51%	16%
BVB	PAT	3	34	94	44	126	161	249	179
	Growth	-95%	1149%	181%	412%	34%	28%	55%	39%
VIB	PAT	562	1.124	2.194	1.293	3.266	4.642	6.410	4.773
	Growth	8%	100%	95%	68%	49%	42%	38%	43%
VPB	PAT	3.935	6.441	7.356	5.910	8.260	10.414	11.721	10.132
	Growth	64%	64%	14%	47%	12%	26%	13%	17%
OCB	PAT	387	817	1.761	988	2.582	3.535	4.405	3.507
	Growth	85%	111%	116%	104%	47%	37%	25%	36%
SHB	PAT	913	1.539	1.672	1.375	2.418	2.607	5.007	3.344
	Growth	15%	69%	9%	31%	45%	8%	92%	48%
MBB	PAT	2.912	3.520	6.113	4.181	7.823	8.263	12.697	9.594
	Growth	17%	21%	74%	37%	28%	6%	54%	29%
STB	PAT	89	1.182	1.790	1.020	2.455	2.682	3.411	2.849
	Growth	-86%	1233%	52%	400%	37%	9%	27%	25%
TCB	PAT	3.149	6.446	8.463	6.019	10.075	12.325	18.052	13.484
	Growth	106%	105%	31%	81%	19%	22%	46%	29%
TPB	PAT	565	964	1.805	1.111	3.094	3.510	4.829	3.811
	Growth	1%	70%	87%	53%	71%	13%	38%	41%
VCB	PAT	6.876	9.091	14.606	10.191	18.511	18.451	21.919	19.627
	Growth	29%	32%	61%	41%	27%	0%	19%	15%
MSB	PAT	140	122	868	377	1.044	2.011	4.035	2.363
	Growth	20%	-13%	612%	206%	20%	93%	101%	71%
Total	PAT	34.076	48.106	65.207	49.128	84.494	98.093	128.527	103.704
	Growth	30%	41%	36%	36%	30%	16%	31%	26%

Note: Unit–billion VND.
Source: Authors' elaboration based on the FiinTrade database.

In the whole period of 2016–2023, the *PAT* of 15 commercial banks has grown significantly, nearly three times from VND 34,076 billion to over VND 100 trillion, despite being affected by the COVID-19 pandemic since 2021. However, the annual profit growth rate has declined quite sharply compared to the pre-pandemic period, nearly 10% from the average growth rate of 36%/year. This result is similar to the FSB (2020) and World Bank's (2022) data on declining profit growth. However, there are differences between banks of different sizes. In the post-COVID-19 period, 2023 is the year when *PAT* is recorded at the highest level among most commercial banks, in which Joint Stock Commercial Bank for Foreign Trade of Vietnam (VCB) is the highest (VND 21,918 billion), followed by Vietnam Technological and Commercial Joint Stock Bank (TCB) (VND 18,052 billion) and Vietnam Joint Stock Commercial Bank for Industry and Trade (CTG) (VND 14,088 billion). It shows that the cost control efficiency of commercial banks is also different. Typically, VCB has the top 3 in net income, but the *PAT* is the industry leader, or TCB is in the top 4 in revenue. *PAT* reached the top 2. BanVietBank (BVB) is the bank with the lowest yield in the industry, at 248 billion dong in 2021. This is possible because commercial banks have accumulated profit buffers from previous periods to face the challenges of the unprecedented COVID-19 period and, at the same time, benefit from many policies of the bank. The Government and the SBV issued support for the economy.

Table 4. Efficiency before and after COVID-19 of commercial banks for *PAT*

Group	*Obs.*	*Mean*	*Std. err.*	*Std. dev.*	*[95% Conf. interval]*	
Before COVID-19	45	54,531	130.7122	147.0512	0.050575	1.106917
After COVID-19	45	116,238	143.8397	161.8197	0.047116	0.989738
Combined	90	85,384	138.2212	155.4989	0.049697	1.044846
Diff		-61,707				
diff = Mean (before COVID-19) – Mean (after COVID-19) *H₀*: diff = 0 *Ha*: diff < 0; *Ha*: diff ! = 0; *Ha*: diff > 1 Pr (T < t) = 0.5623; Pr (|T| > |t|) = 0.0481; Pr (T > t) = 0.0274						

diff = Mean (before COVID-19) – Mean (after COVID-19)
H_0: diff = 0
Ha: diff < 0; *Ha*: diff != 0; *Ha*: diff > 1
Pr (T < t) = 0.5623; Pr (\|T\| > \|t\|) = 0.0481; Pr (T > t) = 0.0274

Source: Authors' elaboration.

The test results from the T-test model in Table 4 also show that Pr (\|T\| > \|t\|) = 0.0481 < 0.05, which confirms that there is a difference in the average value of *PAT* between the two periods (before and after COVID-19). Specifically, the average value of *PAT* before COVID-19 is VND 54,531 billion, and the average value of *PAT* after COVID-19 is VND 116,238 billion. Thus, the period after COVID-19 is VND 61,707 billion, higher than before COVID-19.

This result can be assessed from two main groups of issues: first, banks enjoy preferential policies from the government with economic stimulus packages after the pandemic. Second, on the internal solutions that commercial banks have implemented to respond and adapt to the pandemic situation. Commercial banks have accumulated profit buffers from previous periods to face the challenges of the unprecedented COVID-19 period.

4.3. Return on equity

According to data collected and calculated from the financial statements of 15 Vietnamese commercial banks, Table 5 and Figure 2 show the *ROE* value statistics for 2016–2023.

Table 5. Results for return on equity (*ROE*)

Bank code	2016	2017	2018	2021	2022	2023
ABB	4.19	8.17	11.01	13.6	13.34	15.12
ACB	9.87	14.08	27.73	24.64	24.31	23.90
CTG	11.78	12.02	8.05	13.10	16.9	15.88
BID	14.41	14.94	14.59	12.93	9.18	13.06
BVB	0.08	1.01	2.78	3.51	4.22	5.83
VIB	6.47	12.83	22.55	27.11	29.57	30.33
VPB	25.75	27.48	22.83	21.47	21.92	16.51
OCB	8.65	15.05	23.58	25.44	24.43	22.45
SHB	7.46	11.02	10.78	13.88	12.26	16.81
MBB	11.59	12.42	19.41	21.79	19.13	23.49
STB	0.40	5.20	7.48	9.56	9.63	10.79
TCB	17.47	27.71	21.53	17.96	18.41	21.59
TPB	10.79	15.59	20.87	26.11	23.54	22.6
VCB	14.78	18.09	25.49	25.90	21.11	21.59
MSB	1.03	0.89	6.31	7.28	12.67	20.74
Whole industry	11.97	15.68	18.89	19.71	17.31	18.48

Note: Unit–%.
Source: Authors' elaboration based on the FiinTrade database.

Figure 2. *ROE* of listed commercial banks
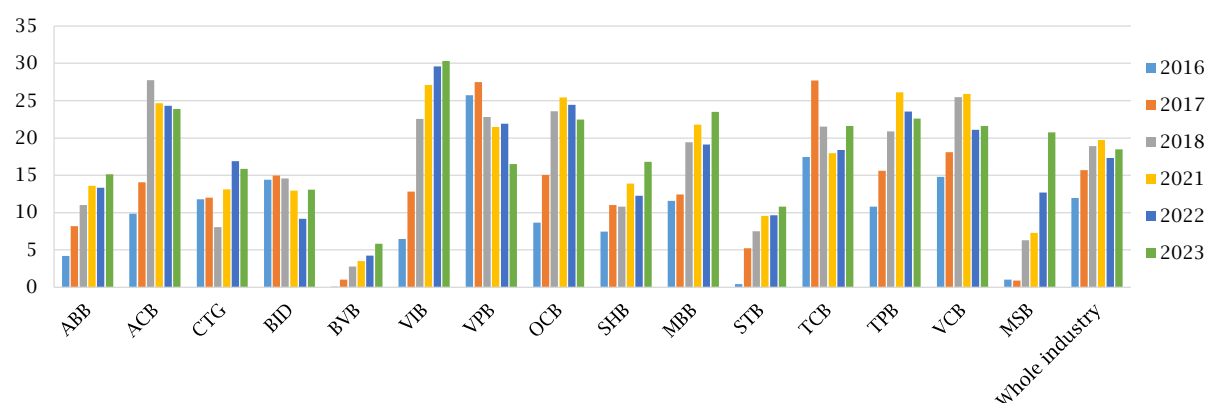
Source: Authors' elaboration.

According to the above report, the industry average *ROE* data shows that despite the powerful impact of the COVID-19 pandemic, the *ROE* trend still maintains an upward momentum in the period 2016–2023, but in the period 2021–2022, *ROE* shows signs of decreasing and recovering at the end of 2023. However, Vietnam is one of the few countries with a financial system that remains effective thanks to the flexibility and quick response from the management of business and monetary policies of regulatory agencies, similar to the research results of Ikhwan et al. (2023).

Table 6 shows that Pr (\|T\| > \|t\|) = 0.0000 < 0.05, which confirms that there is a difference in the average value of *ROE* between the two periods (before and after COVID-19).

Table 6. Efficiency before and after COVID-19 of commercial banks for *ROE*

Group	Obs.	Mean	Std. err.	Std. dev.	[95% Conf. interval]	
Before COVID-19	45	0.15513	0.025266	1.662026	1.354071	1.453141
After COVID-19	45	0.18321	0.020453	1.212752	1.219048	1.299248
Combined	90	0.16917	0.016703	1.479266	1.306103	1.371589
Diff		-0.0280				
diff = Mean (before COVID-19) – Mean (after COVID-19) *H₀*: diff = 0 *Ha*: diff < 0; *Ha*: diff != 0; *Ha*: diff > 1 Pr (T < t) = 1.0000; Pr (|T| > |t|) = 0.0000; Pr (T > t) = 0.0000						

diff = Mean (before COVID-19) – Mean (after COVID-19)
H_0: diff = 0
Ha: diff < 0; Ha: diff != 0; Ha: diff > 1
Pr (T < t) = 1.0000; Pr (|T| > |t|) = 0.0000; Pr (T > t) = 0.0000

Source: Authors' elaboration.

Specifically, the average value of *ROE* before COVID-19 is 0.15513, lower than the period after COVID-19. Banks generally have *ROE* ratios that fluctuate in many trends (increase-decrease) and different amplitudes. The group of seven banks with *ROE* higher than the industry average in the pre-COVID-19 period still maintained their position, even somewhat different from the rest of the group of banks (VCB, Asia Commercial Joint Stock Bank [ACB], Vietnam International Commercial Joint Stock Bank [VIB], Vietnam Prosperity Joint Stock Commercial Bank [VPB], TCB, Orient Commercial Joint Stock Bank [OCB], Military Commercial Joint Stock Bank [MBB], etc.), only TCB had an *ROE* that dropped sharply in 2021 to below the industry average but rose again in the following years. For banks with *ROE*s lower than the industry average, volatility has changed after the pandemic.

Vietnam Maritime Commercial Joint Stock Bank (MSB) had a substantial shift in this index and had an *ROE* higher than the industry average for the first time in 2023. Some banks also had a steadily increasing *ROE* during this period, although still at a low threshold (A Binh Commercial Joint Stock Bank [ABB], Saigon Thuong Tin Commercial Joint Stock Bank [STB], BVB). The remaining group showed an uneven increase, a decrease over the years.

4.4. Return on assets

Unlike the fluctuations of the *ROE* analyzed in the table above, the industry average *ROA* in the post-COVID-19 period tends to increase over the years and is higher than in the pre-pandemic period, showing the effectiveness of the industry.

Table 7. Results for return on assets (*ROA*)

Bank code	2016	2017	2018	2021	2022	2023
ABB	0.35	0.62	0.82	1.04	1.02	1.31
ACB	0.61	0.82	1.67	1.69	1.86	1.98
CTG	0.79	0.73	0.47	0.79	1.07	0.99
BID	0.67	0.63	0.60	0.61	0.48	0.66
BVB	0.01	0.09	0.22	0.26	0.28	0.36
VIB	0.59	0.99	1.67	2.02	2.16	2.31
VPB	1.86	2.54	2.45	2.36	2.62	2.38
OCB	0.68	1.10	1.91	2.37	2.61	2.61
SHB	0.42	0.59	0.55	0.70	0.67	1.09
MBB	1.21	1.22	1.83	2.90	1.90	2.40
STB	0.03	0.34	0.46	0.57	0.57	0.67
TCB	1.47	2.55	2.87	2.90	3.06	3.65
TPB	0.62	0.84	1.39	2.06	1.89	1.93
VCB	0.94	1.00	1.39	1.61	1.45	1.60
MSB	0.14	0.12	0.69	0.71	1.21	2.12
Whole industry	0.77	1.03	1.36	1.42	1.50	1.68

Note: Unit — %
Source: Authors' elaboration based on the FiinTrade database.

Figure 3. *ROA* of the listed commercial banks
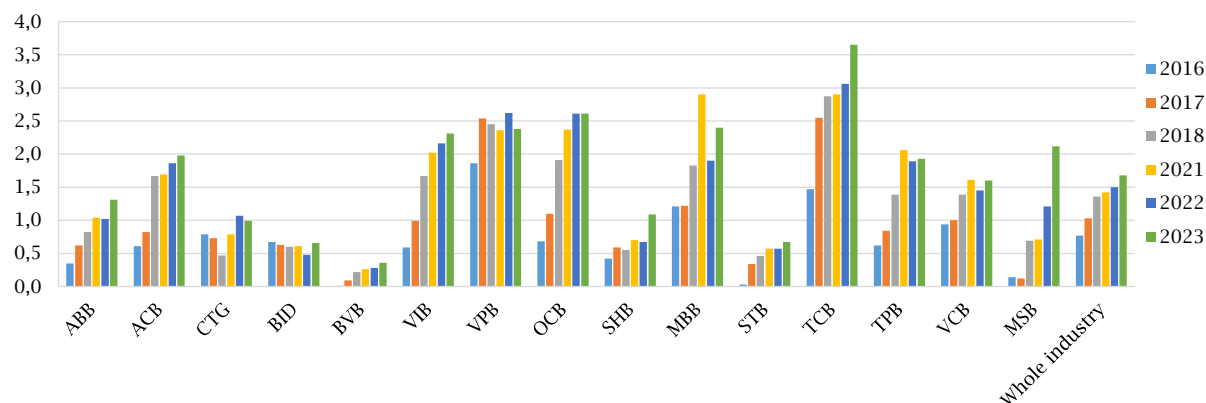
Source: Authors' elaboration.

Asset utilization of the banking sector has improved markedly. The volatility of this index for each bank in 2018 — the time before the COVID-19 pandemic and the first year after the pandemic in 2019 — also tended to increase in all banks in the sample. However, in the following years, when the impact of the epidemic "infiltrated" the economy more robustly and deeply, the fluctuations in each group of banks had a different trend. Of the 8/15 commercial banks with ROA higher than the industry average maintained for at least 2021–2023, only 4/8 commercial banks continued to maintain an uptrend and remained stable in the following years, namely ACB, VIB, OCB, and TCB.

Table 8. Efficiency before and after COVID-19 of commercial banks for *ROA*

Group	Obs.	Mean	Std. err.	Std. dev.	[95% Conf. interval]	
Before COVID-19	45	0.01053	0.003157	0.207663	0.113662	0.126041
After COVID-19	45	0.01533	0.003677	0.218032	0.104473	0.118891
Combined	90	0.01293	0.002398	0.212399	0.111488	0.120897
Diff		-0.0048				
diff = Mean (before COVID-19) – Mean (after COVID-19) H_0: diff = 0 Ha: diff < 0; Ha: diff != 0; Ha: diff > 1 Pr (T < t) = 0.9539; Pr (|T| > |t|) = 0.0753; Pr (T > t) = 0.0124						

Source: Authors' elaboration.

The test results from Table 8 show that Pr (|T| > |t|) = 0.0753 > 0.05, which is not enough to confirm that there is a difference in the average between the two periods before and after COVID-19. The difference in the average value of *ROA* between the two periods is only -0.0048.

4.5. Net interest income

Regarding *NII*, from 2016 to 2023, commercial banks in both the period before and after COVID-19 had positive *NII*. It increased over the years at 12/15 commercial banks in the past year. The study sample reflects the industry's overall efficiency, which is relatively stable and growing compared to other sectors of the economy.

However, there is a vast difference in *NII* between large groups of commercial banks and the rest. Despite the heavy and profound impact of the COVID-19 epidemic on business activities, 2023 still recorded the highest *NII* compared to other years, with VND 46,823 billion (Joint Stock Commercial Bank for Investment and Development of Vietnam — BID), followed by VCB (VND 42,400 billion), CTG (VND 41.788 billion). TCB has the highest *NII* of VND 26.699 billion among private joint stock commercial banks. BVB is the commercial bank with the lowest *NII* of VND 1,435 billion. Table 9 shows that Pr (|T| > |t|) = 0.0218 < 0.05, which confirms that there is a difference in the average value of *NII* between the two periods (before and after COVID). Specifically, the average value of *NII* before COVID-19 is VND 175,012 billion, and the average value of *NII* after COVID-19 is VND 292,907 billion. Thus, the period after COVID-19 is VND 11,789 billion higher than before COVID-19.

Table 9. *NII* and the growth rate of *NII*

Bank code	Index	2016	2017	2018	Average before COVID-19	2021	2022	2023	Average after COVID-19
ABB	*NII*	1.826	2.182	2.039	2.015	2.478	2.382	3.065	2.641
	Growth	11%	19%	-7%	8%	22%	-4%	29%	15%
ACB	*NII*	6.892	8.458	10.363	8.571	12.112	14.582	18.945	15.213
	Growth	17%	23%	23%	21%	17%	20%	30%	22%
CTG	*NII*	22.405	27.073	22.212	23.897	33.199	35.581	41.788	36.856
	Growth	19%	21%	-18%	7%	49%	7%	17%	25%
BID	*NII*	23.435	30.955	34.956	29.782	35.978	35.797	46.823	39.533
	Growth	21%	32%	13%	22%	3%	-1%	31%	11%
BVB	*NII*	550	669	800	673	932	1.105	1.435	1.157
	Growth	26%	22%	20%	22%	17%	18%	30%	22%
VIB	*NII*	2.626	3.456	4.825	3.636	6.213	8.496	11.816	8.842
	Growth	12%	28%	40%	28%	29%	37%	39%	35%
VPB	*NII*	15.168	20.614	24.702	20.161	30.670	32.346	34.349	32.455
	Growth	47%	36%	20%	34%	24%	5%	6%	12%
OCB	*NII*	1.661	2.401	3.436	2.499	4.101	4.982	5.766	4.949
	Growth	25%	45%	43%	38%	19%	21%	16%	19%
SHB	*NII*	4.175	4.797	5.556	4.843	7.830	9.933	15.570	11.111
	Growth	13%	15%	16%	15%	41%	27%	57%	42%
MBB	*NII*	7.979	11.219	14.583	11.260	18.000	20.278	26.200	21.492
	Growth	9%	41%	30%	27%	23%	13%	29%	22%
STB	*NII*	4.021	5.278	7.634	5.644	9.181	11.527	11.964	10.891
	Growth	-39%	31%	45%	12%	20%	26%	4%	17%
TCB	*NII*	8.142	8.930	11.390	9.488	14.258	18.751	26.699	19.903
	Growth	13%	10%	28%	17%	25%	32%	42%	33%
TPB	*NII*	2.121	3.172	4.378	3.224	5.633	7.619	9.946	7.733
	Growth	51%	50%	38%	46%	29%	35%	31%	32%
VCB	*NII*	18.533	21.938	28.409	22.960	34.577	36.285	42.400	37.754
	Growth	20%	18%	30%	23%	22%	5%	17%	15%
MSB	*NII*	2.253	1.602	2.902	2.252	3.062	4.822	6.216	4.700
	Growth	42%	-29%	81%	31%	6%	57%	29%	31%
Total	*NII*	121.787	152.744	178.185	150.905	218.224	244.486	302.982	255.230
	Growth	18%	25%	17%	20%	22%	12%	24%	19%

Note: Unit–billion VND.
Source: Authors' elaboration based on the FiinTrade database.

Table 10. Efficiency before and after COVID-19 of commercial banks for *NII*

Group	Obs.	Mean	Std. err.	Std. dev.	[95% Conf. interval]	
Before COVID-19	45	175012	152.523	171.5884	0.059014	0.064131
After COVID-19	45	292907	167.841	188.8211	0.054978	0.060675
Combined	90	233959	161.285	181.4456	0.057989	0.061792
Diff		-11789				
diff = Mean (before COVID-19) – Mean (after COVID-19)						
H_0: diff = 0						
Ha: diff < 0; *Ha*: diff != 0; *Ha*: diff > 1						
Pr (T < t) = 0.7221; Pr (|T| > |t|) = 0.0218; Pr (T > t) = 0.0174						

Source: Authors' elaboration.

Regarding the *NII* growth rate, this indicator of 15 commercial banks from 2016–2023 is relatively high. However, the growth rate was different before and after COVID-19, in which most commercial banks had a higher income growth rate in the pre-COVID-19 period and a lower one in the post-COVID-19 period (Ikhwan et al., 2023). Although the scale of *NII* of units after the pandemic increased, the growth rate was influenced by the epidemic situation. At the same time, commercial banks with small net profit scales have higher growth potential, and growth rates are less pressured than commercial banks with high net profit scales. The growth rate of *NII* decreased the most in 2022, therefore, on average, the whole post-COVID-19 period decreased slightly compared to the pre-COVID-19 period. This comes from the main reason for the decrease in credit demand after the pandemic, partly due to supply chain disruptions, stagnation of production, and business from social isolation. Another reason is the policy of reducing interest rates to support the economy, causing total interest income to decline in growth rate.

4.6. Minimum capital adequacy ratio

To assess financial stability, we examined the *CAR* as one of the key indicators. *CAR* reflects a bank's ability to absorb a reasonable amount of loss and complies with statutory capital requirements. Table 10 below provides *CAR* values of 15 commercial banks over the 2016–2023 period, covering both pre- and post-COVID-19 phases.

Table 11. Minimum capital adequacy ratio (*CAR*)

Bank	2016	2017	2018	2021	2022	2023
ABB	11%	9%	9%	13%	13%	12%
ACB	7%	6%	7%	11%	12%	13%
BID	5%	5%	5%	6%	6%	6%
BVB	12%	11%	10%	8%	8%	5%
CTG	8%	7%	7%	7%	8%	8%
MBB	12%	12%	11%	13%	13%	12%
MSB	20%	17%	15%	15%	18%	17%
OCB	9%	10%	11%	15%	16%	15%
SHB	7%	7%	6%	9%	10%	11%
STB	8%	8%	7%	8%	8%	8%
TCB	10%	12%	20%	21%	22%	21%
TPB	7%	8%	10%	13%	14%	12%
VCB	8%	8%	8%	10%	10%	12%
VIB	10%	8%	9%	10%	12%	12%
VPB	9%	13%	13%	20%	20%	21%

Note: Unit–%.
Source: Authors' elaboration based on the FiinTrade database.

Between 2016 and 2023, commercial banks generally met *CAR* standards according to the regulations of the State Bank, depending on the Circular of the units applied. The average *CAR* ratio of commercial banks did not fluctuate much. In general, large banks have a lower *CAR* than small banks. In 2016–2023, commercial banks moved from applying Circular No. 22/2019/TT-NHNN, closely following Basel II with calculation regulations. Related equity capital and Tier I equity are more closely related. This will lead to the *CAR* coefficient calculated according to Circular No. 41/2016/TT-NHNN tending to be lower than if calculated according to Circular No. 22/2019/TT-NHNN. However, the application and calculation of the CAR coefficient according to Circular No. 41/2016/TT-NHNN will help commercial banks: 1) increase transparency, facilitate investors and investor units, partners, and customers with supervision conditions; set requirements for commercial banks to apply appropriate risk management policies; 2) increasing the quality assessment of commercial banks in the international perspective, which is a positive factor to raise the credit rating, thereby, making it easier to access international capital sources at a reasonable cost.

Table 12. Efficiency before and after COVID-19 of commercial banks for *CAR*

Group	Obs.	Mean	Std. err.	Std. dev.	[95% Conf. interval]	
Before COVID-19	45	0.12523	0.029747	1.956758	1.594193	1.710831
After COVID-19	45	0.13154	0.02408	1.427814	1.435226	1.529648
Combined	90	0.12856	0.019666	1.741589	1.537718	1.614817
Diff		-0.0063				
diff = Mean (before COVID-19) – Mean (after COVID-19) *H₀*: diff = 0 *Ha*: diff < 0; *Ha*: diff ! = 0; *Ha*: diff > 1 Pr (T < t) = 0.8523; Pr (|T| > |t|) = 0.0618; Pr (T > t) = 0.0287						

Source: Authors' elaboration.

T-test results in Table 12 show that Pr (|T| > |t|) = 0.0618 > 0.05, which is not enough to confirm that there is a difference in the average between the two groups of enterprises. Considering the average *CAR* value before and after COVID-19 (0.12523 and 0.13154), the difference is slight (-0.0063).

5. DISCUSSION

5.1. For commercial banks in Vietnam

Firstly, continue to promote the growth of the operation scale, in which it is necessary to focus on sustainable scale growth. Banks must promote the development of small and medium-sized enterprises and retail segments, prioritize credit for production and business loans, and increase the weight of high-yield, low-cost products associated with risk control. New customer development needs to be done in parallel with the selection and retention of existing customers. In addition, it continues to promote the exploitation of benefits from large corporate customers and foreign direct investment customers, focusing on customers with high total benefits.

Secondly, increase the proportion of NII, in which the focus is on improving the size of income from non-credit services through focusing on developing and promoting the supply and diversification of non-credit products and services to customers: account services, payment services, e-banking services, insurance services, trade finance services, and other added utility services. These are non-credit services which have a high growth rate, especially during the COVID-19 pandemic, making a significant contribution to the proportion of the bank's NII and, from there, restructuring operations in the direction of increasing the structure of non-credit activities and income from non-credit activities in the total income of the bank. Non-credit activities have many advantages compared to credit activities.

Third, the concentration of resources promotes capital growth, mainly focusing on developing low-cost capital sources. Commercial banks need to be flexible in managing the size of their capital sources, using capital to ensure liquidity ratios according to the regulations of the State Bank, and have a money supply to meet business needs at low costs. In addition, units need to improve their customers' cash flow management capacity, promote the development of electronic banking channels, promote preferential product and service packages, promote the use of new payment accounts, attract and develop a customer base through association with FinTech partners, payment intermediaries, etc.

5.2. For SBV and regulatory agencies

Firstly, it is necessary to promulgate a policy to flexibly manage credit solutions to control the scale and reasonable credit growth, targeting production and business fields and priority areas according to the Government's policy; strictly control credit for potential risk areas. Secondly, continue to effectively carry out the restructuring of the system of credit institutions according to the Project on Restructuring the System of Credit Institutions Associated with Bad Debt Settlement in the 2021–2025 Period (Decision No. 689/QĐ-TTG), which focuses on handling weak credit institutions, develop a system of credit institutions capable of competing in the domestic market, gradually improving international competitiveness. Third, implement solutions to control and handle bad debts, prevent and minimize new bad debts, and avoid cross-investment, cross-ownership, and manipulative and dominant ownership in relevant credit institutions. The SBV strengthens the inspection and supervision of credit institutions' activities, especially in high-risk areas, striving to maintain the on-balance sheet loan-to-debt ratio in the whole system and credit institutions at a safe level (less than 3%). Fourth, focus on promoting digital transformation in banking and non-cash payment activities. At the same time, strengthening measures to ensure security and safety in payment activities and digital transformation is also an urgent solution to be implemented in the context of such extensive and global digital transformation.

6. CONCLUSION

The results of a study of 15 commercial banks in the period 2016–2023 show that commercial banks in Vietnam are one of the few countries that maintain business stability and efficiency. The scale of net interest profit and total profit maintained growth. Indicators reflecting ROE and ROA profitability continued to maintain a stable level. Financial stability is maintained, as shown in the CAR index maintained by 15/15 commercial banks to meet the regulations of the management agency. However, the negative impact of the COVID-19 pandemic on banking activities will inevitably increase when the scale of business results increases, but the growth rate will decline, showing the strongest in 2022, when 4/5 indicators have dropped sharply and will only gradually recover from 2023. In addition, the impact on banks also differs according to the size of the banks. State-owned commercial banks, with large total assets and large risk provisions, still maintain a good increase, a big difference compared to the rest of the group of private commercial banks. From the results of

the research and analysis, recommendations have been made to enhance operational efficiency and amplify ROE, ROA, and the goal of capital adequacy, including:

1) promoting the growth and focus on sustainable scale growth;

2) increasing the proportion of NII;

3) promotes capital growth, mainly focusing on developing low-cost capital sources;

4) promote the application of technology and digitization in all aspects of operations of the entire commercial banking system;

5) promote lousy debt settlement and improve asset quality;

6) improve the effectiveness of risk management.

Policy suggestions, one of the main results drawn from the analysis and assessment of the policy's impact on the unit's efficiency, have also been mentioned in the study. While the study provides valuable insights into the business efficiency of Vietnamese banks, there are several limitations. First, the dataset is limited to 15 listed commercial banks, which may not fully capture the performance of the entire banking system, especially non-listed or rural banks. Second, the impact of macroeconomic volatility, such as inflation or interest rate fluctuations post-COVID, is not deeply modeled. Future research could broaden the scope to include cross-country comparisons, more robust econometric models.

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APPENDIX. LIST OF COMMERCIAL BANKS

Bank code	Bank name
ABB	A Binh Commercial Joint Stock Bank
ACB	Asia Commercial Joint Stock Bank
CTG	Vietnam Joint Stock Commercial Bank for Industry and Trade
BID	Joint Stock Commercial Bank for Investment and Development of Vietnam
VIB	Vietnam International Commercial Joint Stock Bank
VPB	Vietnam Prosperity Joint Stock Commercial Bank
OCB	Orient Commercial Joint-Stock Bank
SHB	Saigon-Hanoi Commercial Joint Stock Bank
MBB	Military Commercial Joint Stock Bank
STB	Saigon Thuong Tin Commercial Joint Stock Bank
TCB	Vietnam Technological and Commercial Joint Stock Bank
TPB	Tienphong Commercial Joint Stock Bank
VCB	Joint Stock Commercial Bank for Foreign Trade in Vietnam
MSB	Vietnam Maritime Commercial Joint Stock Bank

Source: https://iboard.ssi.com.vn/