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DETERMINANTS OF BANK PROFITABILITY IN VIETNAM: A FOCUS ON FINANCIAL AND COVID-19 CRISES

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Abstract. This research examines the determinants of banks' profit by employing the GLS, GMM and SEM regression method for 574 observations obtaining from 35 banks functioning in Vietnam between 2005 and 2022. Our evidence indicates that non-performing loans, deposit, loan, capital, operating cost, provisions, bank size, Covid-19 pandemic, inflation, economic growth, deposit rate, credit risk, exchange rate and ownership are key factors affecting bank profitability. Our findings show that the global crises are negatively associated with ROA and NIM while they are negatively related to ROE. The COVID-19 has a stronger effect than the financial crisis. Both crises play a moderating role in bank profitability. This research expands the existing literature by analyzing the impact of crises and the moderating effects, crisis comparison, and ownership effect which have not been done so far, to our best knowledge. This research also extends the literature by offering additional understandings about the determinants of bank profitability in emerging economies. Different from the previous studies, our dataset including foreign banks helps us analyze all banks. The investigation of factors affecting profitability also assists banks in regulating and supporting prudential supervisions carefully.

Keywords: financial crisis, COVID-19 pandemic, global crisis, determinants, bank profit, Vietnam.

JEL Classification: G00, G01, G20, G21.

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1. Introduction

Previous studies have paid much attention to the determinants of bank profitability in the recent decades. A large number of research like Garcia and Guerreito (2016), Dietrich and Wanzenried (2014) indicate that bank profitability exerts a vital role in steadiness and competitiveness of the banking system. Bank failure and collapse arise from the low profitability (Bolarinwa et al., 2019). Therefore, an analysis of bank profitability is very important to the banking system's stability and development.

Previous studies posit that bank profit is influenced by many influences at micro and macro level. For micro level, Naceur and Omran (2011) present that bank profit is influenced by bank magnitude by enjoying economies of scale meanwhile Batten and Vo (2019) show that very big banks can face diseconomies of scale and thus little saving cost, leading to lower profitability. Other factors affecting bank profitability are liquidity and credit risk (Miller & Noulas, 1997), non-interest income (Nguyen, 2012), loan loss

provisions (Bouvatier & Lepetit, 2008), non-performing loans (Nguyen, 2024a). For macro level, researchers point out that inflation (Batten & Vo, 2019), interest rate (Levine, 1996), exchange rate (Nguyen, 2024b), and GDP growth (Bekhet et al., 2021) are key determinants of bank profitability.

Many studies indicate that the international financial crisis between 2007 and 2009 is the worst financial crisis in the world since the Great Depression (Andries & Ursu, 2016) but the worst effect on all sectors of the economies around the world since World War II is the COVID-19 epidemic (International Monetary Fund [IMF], 2020). The financial crisis forced many banks and financial institutions to collapse and many organizations such as banks have been closed and incurred big losses by the COVID-19 epidemic. The global crises have impacted strongly the bank profitability and the business cycle is correlated with bank profits (Bolt et al., 2012) while the COVID-19 epidemic has affected entire parts of individuals (Mulyaman & Julianto, 2021; Nguyen, 2024c). Bouzgarrou et al. (2017) highlight that the relationship between the financial crisis and bank profitability is positive for local banks and negative for foreign banks. The financial system and financial stability are strongly affected by the financial crisis. Bank profit is affected by the financial crisis (Almonifi et al., 2021) and bank credit risk has climbed during the COVID-19 epidemic (Marcu, 2021). Most studies indicate the negative effect on the COVID-19 pandemic while Nguyen (2024a) shows a positive correlation between the pandemic and bank effectiveness. Regulators have given many measures to assure the financial stability and decrease the risks to the banking system but the knowledge about the effects of crises on bank profit is so important and thus requiring a careful examination of bank profitability.

This research has four main contributions. Firstly, in spite of the significance of global crises for policymakers and researchers, there are only a limited number of studies that discover the impact of financial crises or the COVID-19 epidemic on bank profit. As far as we know, no existing studies have investigated the combined effect of both the financial crisis and the epidemic on bank profit. The influence of the financial crisis on banks in Vietnam has been paid little attention. Our study is one of the earliest studies to analyze the determinants of bank profit while considering the effects of crises. Therefore, our primary contribution to the existing literature is providing an empirical investigation employing Vietnamese data from the financial crisis and the COVID-19 epidemic. We offer additional understandings into the factors affecting bank profit in emerging markets. The bank panel data set of 35 banks between 2005 and 2022 is then employed. Secondly, the simultaneous impact of the crises on bank profitability and its determinants have not been examined. The moderating role of the crises on bank profit have been ignored in the existing literature. Therefore, we analyze the simultaneous impact and moderating effect by using the SEM. Thirdly, we compare the effects of the COVID-19 and financial crisis on bank profitability. Finally, we analyze factors affecting and evaluate the influence of the COVID-19 and financial crisis on bank profitability. Our dataset includes foreign banks which have not been done so far. The previous research has focused only on domestic banks when analyzing the determinants while we analyze all. The investigation of factors influencing bank profitability assists banks in regulating and supporting practical supervisions wisely.

The rest of this research is structured as follows. Section 2 illustrates the literature review. Section 3 shows the data and research methodology. Empirical evidence, the research results and discussion, is investigated in Section 4. Section 5 presents conclusion and implications.

2. Literature review

Theoretically, researchers point out that the efficiency structure theory, signaling theory, and risk-return hypothesis are widely used theories to investigate factors affecting bank profit. The efficiency structure theory proposed by Demsetz (1973) states that bank can get bigger profits when they operate more efficiently. The reason to explain for this is that bigger banks might have smaller expenses thanks to economies of scale. Bank with higher profits can obtain bigger market share, leading to better efficiency and consequently bigger profits (Smirlock, 1985). Banks obtain income, decreasing operating costs and thus better income if they operate more efficiently than their competitors (Onuonga, 2014). Obamuyi (2013) indicates that bank profitability can be affected by internal efficiencies.

The signaling theory indicates that banks can improve their profits by disclosing their outstanding performance and positive images. This theory also classifies the association between capital structure and bank profit. An increase in capital promotes future expectancy (Trujillo-Ponce, 2012). A lower leverage ratio could lead to the fact that banks run better than their competitors.

The risk-return theory shows that capital and profitability are negatively connected (Ommeren, 2011). Ommeren (2011) points out that higher risk arising from high return is due to small equity proportions and large leverage levels. In addition, financial crisis and COVID-19 pandemic bring shocks in financial market, which banks can be in danger of a high liquidity risk. The business shutdowns, movement limitations, and reduced demand for goods and services during these periods might encourage default payment and massive withdrawals of money from banks (Goodell, 2020). The decrease in deposit arising from low consumption trend can increase financing cost and thus lowering bank profitability (Elnahass et al., 2021).

Empirically, most researchers have analyzed factors affecting bank profitability for a specific nation and their studies have paid little attention to all regions or making an international comparison among a big quantity of nations (Lamothe et al., 2024). Feng and Wang (2018), Le and Ngo (2020), Caterini et al. (2021), Kozak (2021), Çolak and Öztekin (2021), Le et al. (2022), Ho et al. (2023), and Lamothe et al. (2024) are typical examples of across banking sector studies around the world. Feng and Wang (2018) investigate the case of Europe and America. They indicate that European banking system has a lower profitability than American banking system since the banking system in Europe has a bigger funding expenses. Le and Ngo (2020) examine the influences impacting bank profit in 23 nations over the period 2002–2016 to conclude that capital market development positively affects bank profit. Caterini et al. (2021) investigate the risk and return of banks to compare the diverse models of every European banking system. They show that the banks with the best risk profile have profits. Kozak (2021) investigates bank profitability for Central, Eastern and South Europe to indicate that bank risks negatively influence bank profitability. Lamothe et al. (2024) employ the dataset of 2,091 commercial banks functioning in 110 nations worldwide to conclude that both inside and outside influences impact bank profit. The inside elements are listed units, non-performing loans, effectiveness, profit, and market capitalization. The outside causes are price changes, joblessness, interest rates, economic fluctuations, and the situation of the nations in the asset standing. Mirović et al. (2024) examine the case of Euro zone countries to present that non-performing loans and expense to income are negatively associated while net interest income, profit arising from exchanging properties, net fee and commission income are positively correlated with bank profitability. In addition, several researchers also examine the effect of COVID-19 epidemic on the banking sector worldwide. Çolak and Öztekin (2021)

examine the effect of COVID-19 on loan growth in 125 countries to point out that banks with developed and robust financial system can maintain their loan growth. Le et al. (2022) investigate the influence of COVID-19 on bank profit by employing the dataset of 24 Islamic nations between 2013 and 2020 to conclude that sectoral diversification affects positively bank profitability and this diversification could decrease the opposing influence of COVID-19 on bank profitability. Ho et al. (2023) also examine the influence of COVID-19 on bank profitability for 1,231 banks in 90 countries to conclude that revenue diversification could decrease the COVID-19 adverse influence.

For specific country studies, many researchers indicate that bank profitability has been determined by both inside and outside influences. For inside influences, bank size is used by most researchers to investigate the influence of bank size on bank profit. Bank size has both positive and negative effect on bank profit. Evidence from Akhavein et al. (1997) and Smirlock (1985) shows that bank dimension is a positive relation with bank profit. Bank profit and bank size are closely linked (Demirgüç-Kunt & Maksimovic, 1998). Bigger banks can get higher net interest margins (Were & Wambua, 2014). Bank size can improve bank profitability by enjoying economies of scale (Alam et al., 2019). In contrast, very large banks can face diseconomies of scale and thus an increase in bank size will lead to little cost saving (Berger et al., 1987). Banks can get lower profit when they become bigger due to lower quality of management (Batten & Vo, 2019) or lower profitability if bank stability can keep lower earnings fluctuations (Nyola et al., 2021). Larger banks may want to promote their brand name through a higher geographic diversification, and this diversification can be associated with lower valuation, and hence lower profitability. However, banks might get higher profit when they expand geographic complexity with lower default risk, higher fluctuations in earnings (Nyola et al., 2021).

Bank risk management is so important since low property quality and low liquidity positions are two of most determined sources of bank failures. Bank profitability plays a negative role in liquidity and credit risk (Miller & Noulas, 1997). This is because banks providing high risk loans can get more unpaid loans, and hence lower returns. Bank expenses also influence bank profitability. The quality of bank management can improve bank profits and thus a better management quality might enhance bank profits (Molyneux & Thornton, 1992). Many other researchers indicate that bank profits can be affected by many factors such as non-interest income (Nguyen 2012), credit loss provisions (Bouvatier & Lepetit, 2008), non-performing loans (Nguyen, 2024a). Batten and Vo (2019) evidence that bank risk measured by the credit risk provisions divided by total loans affects bank profitability. Bank profitability can be improved by an increase in credit guarantee since the guarantee can decline the expected loss from non-performing loans and rise in profit from lending (Liang et al., 2017). Loan assurance and capital adequacy can improve issues of adverse selection and moral hazard, and hence quality of bank asset leading to operation efficiency (Liang et al., 2017). However, an increase in bank liquidity proportion is negatively connected to net interest margin (Were & Wambua, 2014).

Recent research presents that bank profit is impacted by many factors. Gazi et al. (2022) analyze listed banks' profit in Bangladesh to show that non-performing loans, liquid properties, big volumes of cover capital, bank dimension affect bank efficiency. Yuan et al. (2022) investigate the case of Bangladesh and India between 2020 and 2021 to conclude that bank dimension and leverage play a direct role in bank profitability. Belcaid and Al-Faryan (2023) employ the case of Morocco listed banks to confirm that concentration and foreign ownership have an adverse influence on bank efficiency while domestic ownership has an encouraging

effect. Qehaja-Keka et al. (2023) analyze the case of Kosovo and Albania to conclude that total loans and interest rate are positively related each other while non-performing loans and bank efficiency are adversely associated. Mashamba and Chikutuma (2023) analyze the case of Zimbabwe to indicate that non-interest revenue, bank liquidity, expense effectiveness, capital appropriateness, and bank steadiness are positively associated while industry factor and bank concentration are adversely connected to bank profits. Gazi et al. (2024) evidence that property controlling quality, liquidity and loan risk are positively related while capital appropriateness, functioning effectiveness and bank magnitude are adversely associated with bank efficiency.

For external causes, we can see that macro factors like price change, interest rates, and output growth, might have an influence on bank profits. Interest rates play an important role in bank profits since banks borrow money to lend to get the margin between the deposit rate and the loan rate. Interest rate fluctuations can shorten the interest spread between assets and liabilities, the net savings return and gross investment return (Levine, 1996). This spread can mirror the bank interest margin. Interest rates can be a source of inflation and default risk of loans (Madura & Zarruk, 1995) because interest rates can affect money supply and cost of the banking sector. Interest rate is considered as an essential macroeconomic determinants of bank profit (Hanson & Racha, 1986). An adjustment in interest rates affects bank profits (Ogunleye, 2001). This is because an increase in interest rates help banks get more income from their new assets (Demirgüç-Kunt & Huizinga, 1999). Gazi et al. (2024) point out that both price change and interest rate spread play a positive role in bank profits. In contrast, Naceur (2003) indicates that interest rates have an adverse influence on bank effectiveness while Beckmann (2007), Yap and Kader (2008) show the ambiguous association between interest rates and bank profit. In addition, most researchers point out that price change, GDP and central bank interest rates are the main determinants of bank effectiveness (Bolt et al., 2012). Other economists show that bank profitability can be impacted by the business cycle, short-term interest rates, anticipated price changes, and exchange rates (Bekhet et al., 2021). Mirović et al. (2024) evidence that GDP has a positive influence while inflation, unemployment rate and gross government debt are negatively associated with bank profitability. However, Mashamba and Chikutuma (2023) point out that the connection between GDP, inflation and bank performance does not exist.

Previous studies indicate that bank profit is affected by crises like financial crisis and disease crisis (Almonifi et al., 2021). The financial crisis has an adverse effect on commercial banks' profit efficiencies and costs in Europe (Andries & Ursu, 2016). Bank failures might escalate during pandemics, as seen during the global financial crisis in the United States (Seelye & Ziegler, 2020). Bank got losses between 2006 and 2009 (Yip & Bocken, 2018) and bank credit risk has increased throughout the COVID-19 epidemic (Marcu, 2021). However, the influence of the crises on bank profitability have been relatively small in the strictly controlled financial system like Islamic countries (Erfani & Vasigh, 2018). The evidence shows that banks in Sweden performed well in the worldwide financial crisis in the period 2006–2009 (Lindblom et al., 2010). The COVID-19 pandemic has a negligible influence on Saudi Arabia's financial system (Almonifi et al., 2021). Most of commercial banks in Indonesia have performed well while a few banks have incurred losses during the COVID-19 pandemic (Rahmi & Sumirat, 2021). Gazi et al. (2022) reveal that during the COVID-19 period, non-performing loans, liquid properties, large volumes of cover capital, and irrelevant dimensions led to a decline in bank performance. Nguyen (2024b) evidence that the COVID-19 is significantly connected to bank performance. In addition, the COVID-19 has an adverse influence on bank performance

through higher non-performing loans (Kozak, 2021). Furthermore, the international crises create an environmental turbulence. This environmental turbulence could moderate the relationship bank performance (Zambon et al., 2021). Nguyen (2024d) evidences that the COVID-19 has the moderating effect via bank size, ownership, non-performing loans, and bank equity.

3. Data and research methodology

3.1. Data

Our research sample of 35 banks operating in Vietnam accounts for 74.47% of the bank population in Vietnam because the banking system currently has 47 banks operating in Vietnam. The sample size represents well the Vietnamese banking system. This is because, among the 4 state-fully owned banks, Agribank and OCB are two state-owned banks. Out of 31 joint stock banks, 29 banks are collected in our research sample. 4 out of 9 foreign banks, which have data available and operating a long period in Vietnam are collected.

Our data set is a comprehensive data set since we collected more than 74.47 percent of the commercial banks functioning in Vietnam for a long period. We collected 574 observations from the financial reports of 35 Vietnamese commercial banks between 2005 and 2022. We collect the macro data from the websites of the State Bank of Vietnam and General Statistics Office of Vietnam.

3.2. Methodology

Based on models of previous research like Batten and Vo (2019), and we add three variables, ownership, CRISIS and PAN into the model, reflecting the influence of the financial crisis and the COVID-19 epidemic, the following model for regression is proposed to investigate the determinants of the banks' profitability in Vietnam.

$$Y_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 SIZE_{it} + \beta_3 CR_{it} + \beta_4 OCI_{it} + \beta_5 DEP_{it} + \beta_6 LOAN_{it} + \beta_7 RISK_{it} + \beta_8 CRISIS_{it} + \beta_9 PAN_{it} + \beta_{10} INF_{it} + \beta_{11} GDP_{it} + \beta_{12} RIR_{it} + \beta_{13} EXRATE_{it} + \beta_{14} OWN_{it} + \beta_{15} FOR_{it} + \varepsilon_{it}; \quad (1)$$

$$X_{it} = \beta_0 + \beta_1 CRISIS_{it} + \beta_2 PAN_{it} + \varepsilon_{it}, \quad (2)$$

where Y_{it} are dependent variable, ROA_{it}, ROE_{it} and NIM_{it} measuring the profitability of banks. ROA_{it} is the return on asset, the ratio between net income and total asset. ROE_{it} represents the return on equity, which is the ratio of net income to total equity. NIM_{it}, net interest margin, is measured as the difference between interest earned and interest paid, divided by the average total assets. X_{it} is bank characteristic variables, including NPL_{it}, $SIZE_{it}$, CR_{it}, OCI_{it}, DEP_{it}, $LOAN_{it}$ and $RISK_{it}$. There are eleven independent variables. NPL_{it}, non-performing loans, is calculated by dividing the amount of non-performing loans by the total loans. $SIZE_{it}$ represents the size of the bank, measured by the logarithm of its total assets. CR_{it} is the capital indicator, measured as the ratio of equity to total assets. OCI_{it} is the ratio of operating costs to income. DEP_{it} represents the ratio of customers' deposits to total assets. $LOAN_{it}$ is the indicator measured by total loans divided by total assets. $RISK_{it}$ is the proportion of credit risk provisions to total loans. *CRISIS* denotes the financial crisis during the period 2008–2009, assigned a value of 1 for this timeframe and 0 otherwise. PAN_{it} is the COVID-19 epidemic, assigned a value of 1 for the 2020–2021 epidemic and 0 otherwise. CR_{it} is the capital proportion, measured by equity divided by total assets. INF_{it} is the yearly change in *CPI* and GDP_{it} is the yearly rate

of *GDP*. RIR_{it} is the yearly actual deposit rate. $EXRATE_{it}$ represents the natural logarithm of the exchange rate. OWN_{it} is the ownership which assigns value of 1 for banks with government-owned shares and 0 for otherwise. FOR_{it} is the foreign ownership which assigns value of 1 for banks with foreign-owned shares and 0 for otherwise. ε_{it} is the error term.

The standard regression techniques of panel data, generalized least square, the difference GMM and the SEM are employed to run the regression model. The GLS regressions are employed to solve the problem of multicollinearity and heteroscedasticity if any. Furthermore, the problem of endogeneity may occur, hence the dynamic model is also employed to supply robust results. The GMM technique developed by Arellano and Bond (1991) is used to estimate the regressions. The usage of the system GMM can increase efficiency but this estimation method needs more instruments than the difference GMM and thus this method might not be appropriate to employ with a dataset with small number of groups. Therefore, the difference GMM is appropriately used to estimate our model (Arellano & Bond, 1991) since our first-differenced instruments are not correlated with the unobserved group effects and we include in the levels equation only those variables, which are not correlated with the fixed effects. We also employ the SEM to analyze the interaction between crises and bank characteristic variables, and the moderating role of crises on bank profitability.

4. Research results and discussion

4.1. Descriptive analysis

Figures 1 and 2 show that there is a fluctuation in bank profitability between 2005 and 2022 in the Vietnamese banking sector. ROA increased from 1.5% in 2005 to 2.6% in 2009 due to a decrease in operating costs as shown in Figure 2 while NIM reduced from 3.2% in 2005 and then remained relatively constant at 2.9% till 2009 due to constant lending and borrowing activities. Financial crisis occurred in the period 2008–2009 but the government supported banks and hence increasing in their profit. ROA reduced to 1.6% in 2013 while NIM increased to 3.7% in 2012 because the government stopped supporting, banks increased their lending rates and inflation was high. The lowest level of ROA and ROE between 2012 and 2016 was attributed to banking system instability and deteriorating economic conditions. High NPLs also worsened ROA and ROE (Nguyen, 2024a). ROA increased from 1.1% in 2016 to 2.1% in 2021 because inflation reduced and economic growth was good but NIM remained relatively unchanged. This period shows that ROE sharply raised from 5.4% in 2015 to 15% in 2022. This reflects the fact that management's success in creating income from the Vietnam banks'

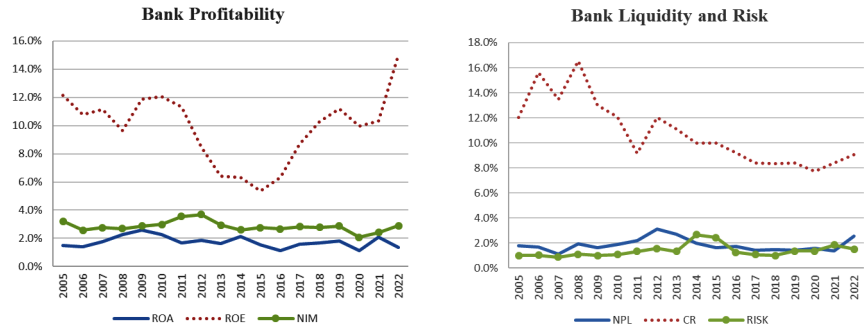

Figure 1. Bank profitability, liquidity and risk

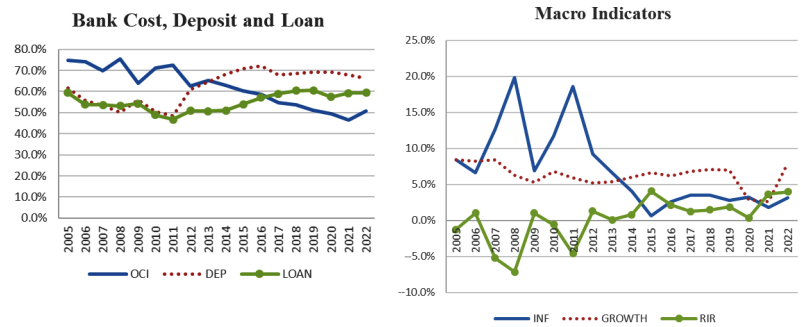

Figure 2. Bank cost, deposit, loan and macro indicators

investment and huge increase in net sales (Nguyen, 2024a). The decline in NIM and ROE from 2019 to 2021 was attributed to reduced dividends paid by banks and directives from the State Bank of Vietnam to lower lending rates amid the COVID-19 pandemic.

Bank equity fraction decreased rapidly from 16.5% in 2008 to 9.2% in 2011, increased to 12% in 2012, reduced to 7.7% in 2020, and then increased to 9.1% in 2022. The period 2005–2011 forced banks to enhance their assets because they prepared for serious competition with foreign banks' entry. This is because Vietnam joined WTO in 2007 and Vietnamese banking market was opened for foreign banks in 2011. This pressure forced banks to increase their capital and equity in 2012. Banks got used to with competition and then maintained reasonable equity compared to asset. In contrast, non-performing loans and risk provisions have not much fluctuated over the period 2005–2022. NPLs were higher between 2011 and 2013 due to the postponed impact of 2008–2009 financial crisis and NPLs have increased since 2021 because of the COVID-19 effect (Nguyen, 2024b). Bank cost, credit and fund mobilization reduced to 2011 due to decreasing economic growth level and high price fluctuation. The economy and inflation have been improved since 2012, hence loan and deposit have been also improved. Banks mobilized funds for their lending and investments over the period 2012–2022.

Table 1 illustrates the average, standard deviation, maximum and minimum values. The maximum value of the ROA is 38.27%, TPBank in 2021 resulting from its positive digital change, and the minimum value of ROA is –9.45%, TPBank in 2011 because of a thoughtful corruption which General Director was detained. The average value of ROA is 1.74% and the standard error is 3.84%. The mean ROE stands at 9.72%, accompanied by a standard deviation of 7.15%. The minimum value of ROE is –5.36%, Saigon Commercial Bank in 2006, and the maximum value of ROE is 29.79%, Asia Commercial Bank in 2006. NIM's minimum value is 0.64%, TPBank in 2011 and its maximum value is 15.44%, Eximbank in 2007. The average NIM stands at 2.83%, with a corresponding standard deviation of 1.41%. This highlights the profit variability among banks in the Vietnamese banking sector, underscoring its high competitiveness and varying levels of financial efficiency. There have been a few banks with loss. Saigon Commercial Bank reported its losses for 2006, 2007, TPBank stated its loss in 2011 and SGbank presented its loss in 2021 because of corruption problem and a rise in bank expenses, the rest of banks have enjoyed their positive profits revealing the strong market power of commercial banks in Vietnam.

In contrast to foreign banks operating in Vietnam and globally, Vietnamese banks typically have smaller sizes and assets. For instance, Agribank, the largest domestic bank in Vietnam,

boasts total assets exceeding USD 70 billion, whereas Shinhanbank's total assets stand at USD 582.67 billion. The logarithm of bank size of Vietnam is 9.06, while that of Thailand and Malaysia is 24.2 and 24.3, respectively. Vietnamese banks' income is around one-fourth of foreign banks' income (Mai Ngoc, 2017). However, Vietnamese banks' ROA (1.74%) is higher than that of Malaysia (1.13%) and Thailand (1.27%). Foreign banks are very cautious in lending but boost retail banking, while Vietnamese banks pay attention to lending. Vietnamese banks' NPLs (1.85%) are higher than that of Malaysia (1.78%) but lower than that of Thailand (2.84%). Vietnamese banks exhibit lower profitability, efficiency, and soundness levels compared to counterparts in Thailand and Malaysia, while their operational and lending risks are comparatively higher.

Table 1. Description of variables (source: our calculation)

Description of variable	Variable	Number of Observations	Mean	Standard deviation	Min	Max
Return on asset	*ROA*	574	0.0174	0.0384	–0.0954	0.3827
Return on equity	*ROE*	574	0.0972	0.0715	–0.0536	0.2979
Net interest margin	*NIM*	574	0.0283	0.0141	–0.0064	0.1544
COVID-19 Pandemic	*PAN*	574	0.1220	0.3275	0	1
Financial Crisis	*CRISIS*	574	0.1481	0.3555	0	1
Capital Ratio	*CR*	574	0.1055	0.0780	–0.7110	0.6903
Operating Cost to Income	*OCI*	574	0.6113	0.2119	0.0010	1.4907
Bank Size	*SIZE*	574	9.0642	2.3261	5.5761	14.466
Deposit rate	*DEP*	574	0.6327	0.1375	0.1851	0.9122
Liquidity risk	*RISK*	574	0.0141	0.0285	0.00005	0.5036
Loan rate	*LOAN*	574	0.5500	0.1393	0.0710	0.8797
Non-Performing Loan	*NPL*	574	0.0185	0.0167	0	0.1830
Inflation	*INF*	574	0.0662	0.0535	0.0063	0.1989
GDP growth	*GDP*	574	0.0618	0.0159	0.0258	0.0846
Real deposit rate	*RIR*	574	0.0047	0.0292	–0.0716	0.0405
Exchange rate	*EXRATE*	574	9.9252	0.1335	9.6715	10.0550
Ownership	*OWN*	574	0.2038	0.4032	0	1
Foreign ownership	*FOR*	574	0.0993	0.2993	0	1

Table 2 displays the correlation matrix between profitability and explanatory variables in the dataset. All of the association values are moderately minor and thus the problem of multicollinearity and serial autocorrelation do not exist in our estimation models.

4.2. Estimated results and discussion

Tables 3, 4 and 5 bellow present the regression results of three methods of estimation, GLS, the difference GMM and the SEM. Our regressed results are robust since the variance inflation factor (VIF) is 2.73, showing no problem of multicollinearity. The GMM test, such as AR (2), addresses first-order autocorrelation and rejects second-order autocorrela-

Table 2. Correlation matrix among variables (source: our calculation)

	ROA	ROA_{t-1}	ROE	ROE_{t-1}	NIM	NIM_{t-1}	NPL	SIZE	CR	OCI
ROA	1									
ROA_{t-1}	0.74***	1								
ROE	–0.01	–0.08*	1							
ROE_{t-1}	–0.04	–0.02	0.78***	1						
NIM	0.003	–0.06	0.36***	0.34***	1					
NIM_{t-1}	–0.02	–0.02	0.30***	0.34***	0.59***	1				
NPL	–0.14***	–0.12***	–0.12***	–0.07	0.03	0.11**	1			
SIZE	0.35***	0.37***	–0.26***	–0.24***	–0.22***	–0.21***	–0.26***	1		
CR	0.04	0.005	–0.13***	–0.10**	0.08*	0.07	–0.05	0.12***	1	
OCI	–0.13***	0.06	–0.08**	–0.05	–0.11***	–0.06	–0.04	0.07	–0.01	1
DEP	–0.10**	–0.11**	–0.01	–0.05	–0.04	–0.04	0.04	0.07*	–0.28***	–0.12***
LOAN	–0.06	–0.10**	0.06	0.03	0.13***	0.09**	0.02	–0.18***	–0.16***	–0.13***
RISK	–0.03	–0.03	0.03	0.08*	0.04	0.06	0.09**	–0.07	–0.02	–0.001
CRISIS	0.05	0.01	0.10**	0.07*	–0.02	–0.06	–0.07*	–0.18***	0.10**	–0.1
PAN	–0.01	–0.03	0.04	0.07	–0.16***	–0.11**	–0.10**	0.13***	–0.11***	–0.03
INF	0.03	0.04	0.13***	0.20***	0.13***	0.06	0.12***	–0.21***	0.07*	0.11***
GDP	0.01	0.01	0.03	–0.04	0.09**	0.04	–0.05	–0.19***	0.12***	0.01
RIR	–0.02	–0.02	0.12***	–0.16***	–0.06	–0.04	–0.04	0.20***	–0.07	–0.09**
EXRATE	–0.03	–0.03	0.12***	–0.13***	–0.05	–0.03	–0.01	0.33***	–0.14***	–0.02
OWN	–0.12***	–0.12***	0.17***	0.17***	0.02	0.02	0.14***	–0.05	–0.18***	–0.02
FOR	–0.003	0.004	0.11**	0.12***	–0.06	–0.05	–0.20***	0.22***	0.11***	–0.03

End of Table 2

	DEP	LOAN	RISK	CRISIS	PAN	INF	GDP	RIR	EX	OWN	FOR
DEP	1										
LOAN	0.38***	1									
RISK	0.13***	–0.11***	1								
CRISIS	–0.211***	–0.03	–0.06	1							
PAN	0.20***	0.10**	0.03	–0.17***	1						
INF	–0.41***	–0.19***	–0.07	0.48***	–0.31***	1					
GDP	–0.18***	–0.01	–0.05	0.15***	–0.08***	0.22***	1				
RIR	0.32***	0.13***	0.07*	–0.58***	0.24***	–0.09***	–0.27***	1			
EXRATE	0.36***	0.11**	0.07	–0.66***	0.39***	–0.06***	–0.05***	0.06***	1		
OWN	0.21***	0.25***	0.06	0.01	–0.004	0.004	0.02	–0.01	–0.03	1	
FOR	0.10**	–0.11***	0.23***	–0.06	0.02	–0.06	–0.05	0.06	0.08*	–0.17***	1

tion. The Hansen test confirms the validity of all instrumental variables, as indicated by the p-values in Tables 3 and 4 aligning with our null hypothesis. Therefore, we use the difference GMM to estimate our model robustly. Our estimated results show that many coefficients are statistically significant.

Banks are looking for ways to attract depositors, borrowers, customers, and find out the key factors affecting bank profitability to increase their profits due to fierce competition. They have found out the factors determining their profits and then constructed their development strategies. Our primary findings have contributed to our knowledge about determinants of bank profitability. Beginning the first factor, several previous studies like Berger et al. (1987), Batten and Vo (2019) show that bank size and profitability are adversely related. They explain that management problem and higher geographic diversification may increase bank costs quicker than bank revenues. Nevertheless, our regression results indicate that the variable SIZE shows a statistically significant positive relationship with both return on assets and return on equity. This suggests that Vietnamese commercial banks have benefited from economies of scale and that larger banks yield greater market influence. By contrast, this variable is negatively significant with net interest margin. This shows the fact that bigger banks spend less dividend than smaller banks. Smaller banks pay higher dividend to attract more investors since they need capital. Larger banks take deposits with lower deposit rates but offer loans to more reliable customers with lower lending rates compared to smaller banks. This is because they can get sound profits when they become bigger. Smaller banks charges higher lending rates due to riskier borrowers and thus higher net interest margin (Nyola et al., 2021).

Table 3. Estimated results – GLS

Variable	ROA		ROE		NIM	
	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
Constant	0.2679	1.33	–0.0792	–0.23	–0.0093	–0.13
NPL	–0.0291	–0.32	–0.6220***	–3.87	–0.0551	–1.64
SIZE	0.0066***	8.31	0.0083***	–6.04	–0.0014***	–4.86
CR	0.0224	1.07	–0.1385***	–3.81	0.0441***	5.80
OCI	–0.0119	–1.46	–0.1186***	–8.41	–0.0153***	–5.20
DEP	–0.0173	–1.25	0.0103	0.43	0.0034	0.68
LOAN	0.0256**	2.10	–0.0139	–0.65	0.0165***	3.73
RISK	0.0758	1.43	–0.0581	–0.63	0.0371*	1.92
CRISIS	–0.0759***	–3.87	0.0082	0.24	–0.0039	–0.54
PAN	0.0190	0.94	0.1252***	3.57	–0.0281***	–3.83
INF	0.0869	1.11	0.8306***	6.09	0.0904***	3.18
GDP	0.0952	0.53	1.4962***	4.81	–0.1587**	–2.44
RIR	0.1234	0.90	1.1081***	4.62	0.0777	1.55
EXRATE	–0.0738	–1.63	0.0417	0.53	0.0117	0.71
OWN	–0.0115***	–3.00	0.0279***	4.18	9.84e–06	0.01
FOR	–0.0150***	–2.74	–0.0306***	3.21	–0.0063***	–3.15
PAN*SIZE	–0.0017	–0.97	–0.0060*	–1.91	0.0016**	2.42
CRISIS*SIZE	0.0097***	4.23	0.0014	0.35	–0.0002	–0.19
Observations	574		574		574	

Note: * – significant at 10%; ** – significant at 5%; *** – significant at 1%.

Table 4. Estimated results – The Difference GMM

Variable	ROA		ROE		NIM	
	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
Constant	0.1103	1.07	0.3615	0.38	–0.3690**	–2.52
ROA (-1)	0.3292***	6.66				
ROE (-1)			0.5751***	9.35		
NIM (-1)					–0.0080	–0.06
NPL	0.0108	0.56	0.0638	0.46	–0.0557**	–2.23
SIZE	0.0037***	3.84	0.02287***	2.95	–0.0028***	–2.97
CR	0.0439	1.06	0.2344	0.71	0.0623	0.78
OCI	–0.0006	–0.13	–0.1177***	–2.74	0.0025	0.36
DEP	–0.0135*	–1.65	0.0666	0.41	–0.0136	–0.60
LOAN	0.0022	0.24	–0.0371	–0.28	–0.0110	–0.64
RISK	0.0392	1.11	0.2794	0.43	0.0096	0.09
CRISIS	–0.0844***	–4.03	0.1558**	2.01	–0.0074	–0.52
PAN	–0.0019	–0.30	0.2403***	3.77	–0.0275***	–2.65
INF	0.0336**	2.36	0.5208**	2.08	0.0208	0.41
GDP	–0.0069	–0.10	1.8453***	4.61	–0.0637	–0.63
RIR	0.0849***	3.06	0.7736*	1.82	0.0258	0.29
EXRATE	–0.0300	–1.30	–0.1550	–0.67	0.0999***	2.64
OWN	–0.0061**	–2.23	0.0226	0.97	0.0056	1.16
FOR	–0.0108**	–2.30	–0.0581*	–1.91	0.0012	0.20
PAN*SIZE	0.0001	0.12	–0.0192***	–3.35	0.0022***	2.81
CRISIS*SIZE	0.0113***	4.21	–0.0170*	–1.95	0.0014	0.88
Hansen test	0.360		0.412		0.540	
AR (2)	0.593		0.629		0.958	
Number of groups	35		35		35	
Number of instruments	33		33		33	
Observations	539		539		539	

Note: * – significant at 10%; ** – significant at 5%; *** – significant at 1%.

While the relationship between equity and profit remains ambiguous, several researchers suggest that the capital ratio significantly impacts bank profitability. Higher ratio of capital may lead to higher bank profitability (Athanasoglou et al., 2008). Lower risk bank may use their advantages to transmit their positive signals by employing a high capital ratio in the case of asymmetric information between investors and managers. Many studies indicate that capital ratio can improve commercial banks' profits since banks with a higher capital ratio might attract lower yielded and more stable deposits (Athanasoglou et al., 2008). Our findings indicate a positive impact of the capital ratio on bank profitability, as evidenced by the statistically significant coefficients in the regression equation for NIM. This underscores the importance of maintaining appropriate bank capital levels to sustain profitability among commercial banks in Vietnam. Increasing the capital ratio could lead to improved bank profitability, as banks may strengthen their core banking operations. This is due to the regulatory policies set by the State Bank of Vietnam, which require commercial banks to maintain a strong capital ratio to ensure the stability and soundness of the banking system (Batten & Vo, 2019). This reflects the fact that banks can potentially reduce their financing costs by maintaining a higher capital ratio, thereby lowering bankruptcy risks. Banks become the best performing ones if they maintain their high level of equity to assets (Lee & Hsieh, 2013). Therefore, commercial banks in Vietnam tend to keep more equity to get higher profits (Thuy et al., 2018). However, the ratio exhibits a statistically significant negative correlation with return on equity.

This suggests that these banks incur higher costs of capital. The equity capital requirement could decrease operational effectiveness, leading to a decline in bank profit. Increasing capital levels can reduce risk, but according to the conventional risk-return hypothesis, lower risk typically corresponds to lower potential returns. The agency theory indicates that a higher equity can lead to a higher agency cost. In addition, banks with higher equity might operate over cautiously and thus miss growth opportunity, leading to lower profit.

It is believed that operating costs are a crucial factor influencing bank profitability (Samad, 2015). Bank profitability was strongly affected by the cost management (Athanasoglou et al., 2008). Any improvement in management efficiency is translated into an improvement in bank profitability. Our estimated results show that operating cost to income is adversely associated with bank profitability. This implies that commercial bank in Vietnam has incurred cost to maintain customers. Bank profitability is channeled from higher cost and thus the income instability for commercial banks. In the reality, Vietnamese commercial banks normally pass their operating cost to borrowers and depositors leading to a risk increase in the competitive environment. In addition, commercial banks' income in Vietnam has rapidly increased while their operating costs has also rised in the period of overheating growth, and thus effective cost management assuring bank profits (Thuy et al., 2018). The poor management performance brings a higher cost and thus worsen bank profits (Nguyen, 2024a). On the other hand, this evidence shows the struggle of commercial banks in Vietnam. They have been more cautious about new lending when they have higher non-performing loans. This has forced them to increase costs of dealing with bad debts and pre-lending, and hence reducing their profits (Samad, 2015). Commercial banks have expanded their geographic diversification which labor cost and new branch office cost have been in turn increased, and hence increasing operating costs and lower bank profitability.

Bank effectiveness is influenced by the market structure since banks base on market structure in setting loan and deposit prices (Mirzaei et al., 2013). Our finding shows that deposit fraction has an adverse effect on return on asset and net interest margin while loan ratio is positively correlated with return on asset, return on equity and net interest margin. This indicates the fact that there exists a positive correlation between the loans divided by assets and bank profit (Nguyen, 2024b) since commercial banks in Vietnam obtain income mainly from offering loans. By contrast, the ratio between deposit and asset presents an adverse relation with bank profits. This result reveals that the liabilities of commercial banks occupy a high proportion of customer deposits. There have been "deposit wars" among banks, which have harmed bank profitability. Commercial banks are more pressured to make deposits effectively since they take high interest deposits (Ha, 2020). This is because a rise in deposit might result in a rise in interest paying and thus lower bank profits.

Several studies indicate that bank risk is a significant issue for various stakeholders, and banks may achieve higher profits if they adopt a more risk-taking approach (Olszak & Pipień, 2016). However, Lassoued et al. (2016) argue that excessive risk-taking was the root cause of the financial crisis between 2007 and 2009. Our findings suggest that credit risk positively impacts the return on assets and net interest margin of banks, aligning with the conclusions drawn by Naceur and Omran (2011) and Batten and Vo (2019).

Crises such as financial crisis and disease crisis normally affect strongly bank profitability (Almonifi et al., 2021). Financial crisis and bank profit exist a positive relationship (Seelye & Ziegler, 2020). Similarly, our findings show the financial crisis and the pandemic exert an adverse impact on return on asset and the pandemic is negatively correlated with net interest margin. By contrast, our findings show that financial crisis between 2008 and 2009 is

positively correlated with commercial banks' profits in terms of return on equity. Interestingly, we find that the COVID-19 endemic shows a positive influence on return on equity. This reflects the fact that commercial banks in Vietnam run their business very well during the crises (Trang, 2021). Banks have used dividends, which should be paid to shareholders, to obtain more reserves for crises for many years (Nguyen, 2024a). The findings also indicate that the financial crisis and the epidemic present an indirect impact on bank profit through bank size.

The results in Table 5 show that the financial and COVID-19 crises play a moderating influence on bank profitability through bank size, non-performing loans, capital ratio, operating cost, deposit, loan, and loan-loss provisions. The financial crisis discourages bank size while the COVID-19 pandemic encourages it and in turn bank size enhances bank profit. Both crises reduce non-performing loans and consequently improve bank return. The financial crisis forces bank leaders to increase their capital to improve their profit meanwhile the pandemic shows the opposite. The pandemic reduces the costs to improve bank profit. Banks take less deposits during the financial crisis but they receive more deposits during the pandemic. Banks provide more loans and loan-loss provisions leading to better bank profit during the pandemic while the financial crisis has no effect.

Table 5. SEM results

Relationships	ROA	ROE	NIM
CRISIS → SIZE	–1.0105*** (0.000)	–1.0105*** (0.000)	–1.0105*** (0.000)
PAN → SIZE	0.7810** (0.15)	0.7810** (0.015)	0.7810** (0.015)
CRISIS → NPL	–0.0041** (0.011)	–0.0041** (0.011)	–0.0041** (0.011)
PAN → NPL	–0.0052*** (0.000)	–0.0052*** (0.000)	–0.0052*** (0.000)
CRISIS → CR	0.0299** (0.013)	0.0299** (0.013)	0.0299** (0.013)
PAN → CR	–0.0326*** (0.000)	–0.0326*** (0.000)	–0.0326*** (0.000)
CRISIS → OCI	–0.1406 (0.495)	–0.1406 (0.495)	–0.1406 (0.495)
PAN → OCI	–0.3563* (0.083)	–0.3563* (0.083)	–0.3563* (0.083)
CRISIS → DEP	–0.0801*** (0.000)	–0.0801*** (0.000)	–0.0801*** (0.000)
PAN → DEP	0.0741*** (0.005)	0.0741*** (0.005)	0.0741*** (0.005)
CRISIS → LOAN	–0.0100 (0.578)	–0.0100 (0.578)	–0.0100 (0.578)
PAN → LOAN	0.0359** (0.045)	0.0359** (0.046)	0.0359** (0.046)
CRISIS → RISK	–0.0047** (0.024)	–0.0047** (0.024)	–0.0047** (0.024)
PAN → RISK	0.0014 (0.628)	0.0014 (0.628)	0.0014 (0.628)

End of Table 5

Relationships	ROA	ROE	NIM
SIZE → BANK PROFITABILITY	0.0075*** (0.000)	–0.0084*** (0.000)	–0.0913*** (0.003)
NPL → BANK PROFITABILITY	–0.0836 (0.160)	–0.7763*** (0.000)	–0.0012*** (0.000)
CR → BANK PROFITABILITY	–0.0228 (0.101)	–0.0635** (0.019)	0.0161** (0.028)
OCI → BANK PROFITABILITY	–0.0019*** (0.000)	–0.0016*** (0.000)	–0.0004*** (0.000)
DEP → BANK PROFITABILITY	–0.0249* (0.063)	–0.0179 (0.425)	–0.0029 (0.550)
LOAN → BANK PROFITABILITY	0.0200* (0.065)	0.0028 (0.907)	0.0186*** (0.000)
RISK → BANK PROFITABILITY	0.0853*** (0.009)	–0.0179 (0.745)	0.0362** (0.046)
CRISIS → BANK PROFITABILITY	0.0042 (0.394)	0.0299** (0.011)	–0.0038 (0.115)
PAN → BANK PROFITABILITY	0.0011 (0.893)	0.0776*** (0.000)	–0.0108*** (0.001)
INF → BANK PROFITABILITY	0.1115 (0.152)	0.7702*** (0.000)	0.0947*** (0.000)
GDP → BANK PROFITABILITY	0.0662 (0.605)	1.6470*** (0.000)	–0.1422* (0.062)
RIR → BANK PROFITABILITY	0.1861 (0.149)	1.1302*** (0.000)	0.0980** (0.046)
EXRATE → BANK PROFITABILITY	–0.0345*** (0.006)	0.1054*** (0.008)	0.0090 (0.180)
OWN → BANK PROFITABILITY	–0.0123*** (0.000)	0.0328*** (0.000)	–0.0001 (0.911)
FOR → BANK PROFITABILITY	–0.0128*** (0.008)	0.0447*** (0.000)	–0.0019 (0.405)

Note: * significant at 0.10, ** significant at 0.05, *** significant at 0.01. P-value is in bracket with robust standard error.

Many economists point out that bank profits are influenced by the business cycle, short-run interest rates and price change expectations (Chronopoulos et al., 2015). Other researchers such as Albertazzi and Gambacorta (2009) and Bolt et al. (2012) consider inflation, output growth and central bank interest rates as the key factors affecting bank profit. Our findings suggest that inflation, economic growth, exchange rate and deposit rate play a significant role in bank profit in Vietnam (Minh & Canh, 2015) since coefficients of these variables are positively significant. This is because commercial banks may pass the cost of inflation to their customers, and deposit rates and lending rates are rapidly adjusted when inflation changes (Batten & Vo, 2019; Nguyen, 2024b). Banks can enjoy benefits from higher rate of inflation since Vietnam is still developing country and commercial banks can shift their development towards retail segments to obtain these benefits (Hai et al., 2020). As economic environment becomes better, commercial banks can get profits because they offer higher interest-bearing loans due to a high money demand and borrowers get higher profits and in turn pay back

interest and loans as promised. The estimated results also show that an appreciation in Vietnamese Dong could harm bank efficiency measured by return on equity and net interest margin while this appreciation could improve return on asset. Banks with the government and foreign ownership have lower returns than private ownership banks.

5. Conclusions and implications

5.1. Conclusion

Examining the factors affecting bank profit in Vietnam between the financial crisis and the Covid-19 pandemic is an interesting topic. We consider bank detailed characteristics, sector specific and macro elements as determinants of bank efficiency. In our research, we find that previous returns, bank size, non-performing loans, credit risk, crises, price change, change in gross domestic product, real deposit rate, exchange rate and ownership are key factors influencing bank profit in Vietnam. Bank size, inflation, economic growth and real deposit rate are positively correlated with bank profitability meanwhile non-performing loan, financial crisis and Covid-19 pandemic have an adverse correlation with bank profit. Banks with government and foreign ownership have lower return on asset since they can lend at lower rate. The financial and COVID-19 crises exert a moderating impact on bank profit through bank dimension, non-performing loans, capital, operating costs, deposit, loans and credit provisions. The financial crisis and the COVID-19 crisis are negatively related to bank profitability. During the crises banks have issued less shares but paid more dividends than other periods.

5.2. Implications

Theoretical implications: Our contributions to the existing literature are to examine the experimental exploration by utilizing the Vietnamese proof to present additional understandings into what determines bank efficiency in emerging markets between the financial crisis and the Covid-19 pandemic. The panel dataset of 35 banks from 2005 to 2022 is then employed. We also analyze the simultaneous impact and moderating role of the crises on bank profitability. We then compare the effect of financial crisis and COVID-19 epidemic. Finally, we analyze the factors influencing and the valuation of the effect of the crises on bank profit. The investigation of causes influencing bank profit assists banks in regulating and supporting practical supervisions wisely.

Practical implications: For bank regulators, non-performing loans should be well regulated to keep the banking system more stable. They should monitor inflation, economic growth, interest rates and exchange rates to incorporate them in the decision making process. For bankers, they should expand their size to enjoy economies of scale, exploit the opportunity of financial crisis, inflation and economic growth to improve their profit. They should manage their operation cost, use deposit effectively, and control the negative effects well during the COVID-19 pandemic. The property quality should be measured in the framework that non-performing loans arising from financing for the real estate market during the COVID-19 pandemic. Factors, operating cost, deposit ratio, COVID-19, having a negative influence on bank profitability, should be critically analyzed by Vietnamese banks to restructure their strategies to obtain higher profits. They should focus on customer loyalty and efficiency of the commercial approach to improve their profit by orienting their business model to their customer. Risk management should be well done by carrying out corporate governance model

and internal control system. Bankers should have flexible and suitable adjustments to the concentration or diversification of assets in different stages to manage bank profitability during the crises. Diversified assets and a policy of sanctioning and managing loans should be provided. Operating costs should be reduced and only allow these costs increase suitably when revenue raises faster than the costs. They should invest more in finance technology, digital technology, AI in banking operations to increase their efficiency. This is because the technology applications can help banks recover and strengthen financial stability. These crises help bank booster digital procedures of transaction and operations. This application can help banks reduce their costs, enhance their services, satisfy their customers, and increase their profitability. Bankers should take advantage of government support during the crises to maintain their profitability. Bank should increase customer comfort and protection via digital banking.

Vietnam's banking industry is small but it exerts an essential role in the world banking system. It assists foreign banks in learning banking business models especially when they enter the Vietnamese banking market. It helps and collaborates with foreign banks in business activities such as international payment and money transfer. Banking activities of Vietnamese banks are similar to those of foreign banks. Therefore, foreign banks operating in Vietnam or other countries can learn from Vietnamese banks as presented in practical implications.

Limitations and further study: Our research has four valuable contributions but it still exists some limitations. First, the causal relationship between bank profitability and its determinants can help bankers provide relevant policies to enhance bank profitability and strengthen financial stability, but we do not examine this causal relationship. Second, some other factors like sectorial diversification and monetary policies can explain the determinants and assist bankers in improving and keeping financial stability but they have not been analyzed by our research. The further study should examine carefully the causal relation and adding more variables in the research model. Finally, a qualitative analysis allows us to provide a general picture and arguments of factors driving bank profitability but we do not provide a descriptive analysis on how inside and outside causes influencing bank efficiency. The further research should provide a qualitative analysis on how these factors influence bank profitability.

Disclosure statement

I do not have any competing financial, professional, or personal interests from other parties.

Conflicts of interest

There is no conflict of interest.

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