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Does COVID-19 affect non-performing loans at commercial banks in Vietnam?

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Abstract: The paper aims to investigate the direct connection between COVID-19 and non-performing loans in Vietnamese commercial banks from 2011 to 2021. This article uses qualitative (expert interviews, namely senior credit officers' and credit managers' surveys to find the expert consensus coefficient) and quantitative research methods (generalised method of moments to solve the endogeneity) to define that COVID-19 is a statistically significant factor and positively affect non-performing loans. In line with financial accelerator theory, the author emphasises the significant role of the economic shock in amplifying the non-performing loans at commercial banks in Vietnam during the COVID-19 pandemic. Besides, the paper provides some managerial implications to control and mitigate non-performing loans in the credit granting process.

Keywords: COVID-19; commercial banks; non-performing loans; NPLs; generalised method of moments; GMM; Vietnam.

JEL codes: M10, G21, H81.

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Biographical notes: Nguyen Kim Quoc Trung is currently a Lecturer at the University of Finance – Marketing, Vietnam. He is interested in researching the banking sector, finance, and management. He has written a total of some articles in various journal indexed by Scopus, such as *International Journal of Economics and Finance Studies*, *Cogent Business & Management*, *International Journal of Interdisciplinary Organizational Studies*, *Emerging Science Journal*, *International Journal of Asian Business and Information Management*, *Journal of Eastern European and Central Asian Research*, and *International Journal of Procurement Management*. In addition, he has served as a reviewer of some international journals listed in Scopus.

1 Introduction

The extensive literature has proved that non-performing loans (NPLs) increased in the global financial crisis (Morakinyo et al., 2018; Purnanandam, 2010) and the empirical studies related to the determinants of NPLs, such as Firmansyah (2019), Khan et al. (2020), Manz (2019), Nguyen Kim (2020), Nguyen Thi (2017) and Umar and Sun (2018). Since unprecedented financial crises have been witnessed in numerous countries

(Khan et al., 2020), and their heavy consequence to the banking systems in the world, the government and central banks implement control and monitor the quality of credit strictly. Put in other words, NPLs are mainly under the eyes of government management since they are considered with the failure and crises of the banking system (Ghosh, 2015; Khan et al., 2020). After the global financial crisis, to avoid the bankruptcy and liquidity problems, Basel III was born with tighter capital and liquidity requirements that aim to help the global banking system to improve its safety during the crisis. For instance, according to Lee et al. (2022), a study shows a downward trend from 2008 to 2018 in NPLs.

After one decade, in 2019, COVID-19 made economic hazards to the world severe, which has affected the economy and society. The pandemic could trigger a significant economic recession causing the problem of expenditures and investment of all classes in the economy (World Bank, 2020). As a result, this pandemic creates the risk of savings withdrawals, rising default rates, slowing credit growth, low-interest income and high NPLs (Goodell, 2020; World Bank, 2020). However, because of Basel III regulations implemented, the banks are better positioned to absorb the loss caused by COVID-19 pandemic.

During the pandemic, studies about the determinants of NPLs in the banking system are conducted (Alnabulsi et al., 2022; Ansari et al., 2021; Ari et al., 2020; Kryzanowski et al., 2022; Žunić et al., 2021). These empirical findings indicate that NPLs are sensitive to bank-specific factors and macroeconomic factors, including COVID-19. In Vietnam, although there have been qualitative studies on the fluctuation of NPLs during the epidemic period, the impact of COVID-19 on NPLs is still limited. Therefore, the main objective of this study is to estimate the effect of COVID-19 on NPLs in the Vietnamese banking system. The findings show the significant and positive influence of COVID-19 on NPLs, while the study by Alnabulsi et al. (2022) finds that no significant effect has been detected associated with the impact of the COVID-19 pandemic.

The current findings are explained based on the financial accelerator theory, which addresses the adverse economic shocks that may be amplified by worsening financial market conditions. Adverse conditions in the real economy and financial markets propagate the financial and macroeconomic downturn (Foglia, 2022). Hence, the research question is as follows: 'Does COVID-19 affects NPLs in the Vietnamese banking system?'.

Starting the literature review involves the financial accelerator theory and empirical studies, the author discusses them briefly to set a background for building the model. The author emphasises the COVID-19 influencing NPLs at listed commercial banks in the second section. Those are the platforms from which the research hypothesis is proposed. The following section presents the methodology by which the author implements the generalised method of moments (GMM) to deal with endogeneity. In addition, the author interprets and discusses the findings in the next section. Finally, the author mentions some of the study's limitations based on the findings.

2 Literature review and hypothesis development

2.1 Literature review

Blanchard (2009) defines an NPL as any loan whose interest and principal payments are over 90 days overdue. Also, Asari (2011) and Petersson and Wadman (2004) acknowledge that NPLs as unpayable loans that did not benefit the banking sector. NPLs, in the same sense, may reflect borrowers' inability to repay their loans (Balgova et al., 2016). Moreover, the global financial crisis in 2008 was rooted in the accumulation of NPLs, which has reduced the ability of commercial banks to grant credit. In this context, Basel (in Basel III) introduces leverage ratios as a management tool to reduce the risk of such write-offs and bad debts in creating a stable financial system. Leverage also aims to reinforce risk-based capital requirements, considered a risk-free 'backstop' (Hannoun, 2010). The leverage ratio is defined as a tier 1 capital measure divided by the exposure measure (percentage).

In Vietnam, NPLs are defined based on Circular No. 02/2013/TT-NHNN that NPLs have been classified as those in Groups 3 (sub-standard debts), Groups 4 (doubtful debts) and Groups 5 (potentially irrecoverable debts). In 2018, the acceleration of fifth group debts (i.e., potentially irrecoverable debts) increased by 31%, enhancing the sharp increase of NPLs. As of August 2019, the NPL ratio of banks in Vietnam reached 1.91% (Nguyen Kim, 2020). The COVID-19 outbreak by the end of 2019 has negatively affected the entire economies of the world. As a result, the borrowers have suffered from significantly reduced cash flows, which negatively influenced their ability to repay their debts. The State Bank of Vietnam (SBV) announced that given the impact of COVID-19, NPLs might increase by 3.67% at the end of 2020 compared with the 1.89% growth recorded in the past year and increases in 2021 (Phu Hung Securities Corporation, 2020). Hence, this problem is a shadow that obscures the stability and efficiency of the Vietnamese banking system. After the year of the COVID-19 pandemic, Vietnam's GDP growth slowed down (2.91% in 2020), which is the lowest growth rate in the past 20 years. However, credit growth of about 13% is still a highlight and supports the economy and macroeconomic indicators. At the end of 2020, NPLs of the banking system continued to be controlled and maintained at less than 3%. However, there is an increase in the possibility of an NPL ratio in the following year.

Lee et al. (2022), Morakinyo et al. (2018) and Umar and Sun (2018) have made the connection between the economic growth with the NPLs. These studies show the sufficient stream of the borrower's income to repay their debts leads to the lower NPLs in the expansionary economic phase. It means that the macroeconomic determinants to the NPLs. Some studies have demonstrated the effect of leverage on NPLs in the banking system in the normal economic situation (Isaev and Masih, 2017; Muratbek, 2017; Nguyen Kim, 2020; Pham and Nguyen, 2018; Radivojevic and Jovovic, 2017; Trung, 2019; Waqas et al., 2017) while Hardiyanti and Aziz (2021), Khan et al. (2020) and Žunić et al. (2021) explore only the effect of COVID-19 on NPLs of Malaysian, Pakistan, Bosnia and Herzegovina banks, respectively. Similarly, COVID-19 is considered as one of the macroeconomic factors affects NPLs at commercial banks in Vietnam. To clarify the impact of COVID-19 on NPLs, the author captured in the financial accelerator theory developed by Bernanke et al. (1996) and Bernanke and Gertler (1986) that aims to explain commercial banks' lending behaviour in the macro economy's cyclical fluctuations. Financial accelerator theory infers the negative relationship between

economic agents' net worth and external finance premium. Because the adverse shocks amplify to the economy by worsening credit market conditions, and cause NPLs increase. Therefore, the financial accelerator theory explains the relationship net worth and credit spread under the imperfect information (Ćorić, 2011; de Groot, 2018; Lee et al., 2022).

It is obvious that the asymmetric information issues raised between lenders and borrowers are the reasons that cause NPLs. Those loans with low credit ratings lead to an increase in the probability of occurrence in NPLs. Under asymmetric information, the banks (lenders) are likely to lack adequate data and information concerning the borrowers to accurately assess their ability to repay loans (Edwards and Turnbull, 1994). Another study by Binks and Ennew (1997) emphasises that the borrowers may be limited to bank loans if their information is not transparent and truthful, regardless of the business's size. The problem of asymmetry information is now increasing remarkably in developing countries, as credit information quality is limited due to effective information management mechanisms and credit information connections between banks. With insufficient data or information related to borrowers, potential risks and ethical risks exist (Edwards and Turnbull, 1994). Asymmetric information and ineffective control over the credit contract enforcement process will bring the credit market equilibrium below the optimal level (Stiglitz and Weiss, 1981). This is a dominant problem in developing countries, such as Vietnam.

2.2 Hypothesis development

Most studies have concentrated on the causes of NPL as well as explored factors affecting the NPLs of the commercial banks. However, there are still gaps in research on NPLs in Vietnam because currently no study has conducted and examined the effect of COVID-19 on NPLs under financial accelerator theory. COVID-19 pandemic, a crisis creates an adverse effect on the economy in the world. According to the trade-off theory, in unstable economic conditions such as a pandemic or financial distress, companies' demand for debts decreases because they lack the funds to repay them, lower profitability, poorer asset quality and lower credit growth (Hardiyanti and Aziz, 2021; Žunić et al., 2021).

Several studies have researched the effect of COVID-19 on NPLs, such as Goodell (2020), Hardiyanti and Aziz (2021), Tiwu (2020) and Žunić et al. (2021). They confirm that the COVID-19 pandemic leads to an increase in NPLs and deterioration of the quality of the loan portfolio at banking system. Besides, unprecedented crises, such as the COVID-19 pandemic have negative consequences for the business. Ding et al. (2021) concludes that firms using their equity for operations perform better than those taking external fundings during the pandemic.

Hypothesis 1 COVID-19 has a positive effect to NPLs in Vietnamese banking system.

3 Research methodology and research model

3.1 Sample

For primary data, the study is then used as the basis of a survey among 50 credit management experts who work at joint-stock commercial banks (SCBs) in Vietnam.

These interviewees have over five working experiences and knowledgeable in banking and finance.

At the end of 2021, the Vietnamese commercial banking system included four state-owned commercial banks, 31 joint-SCBs, nine full-foreign owned banks and two joint-venture banks. However, this research only focuses on the commercial banks, so the sample size used for the regression model is 35 commercial banks[1] compared to 43 banks in Vietnam. Because the dataset involves a large number of banks ($N = 35$) and a small number of years ($T = 11$), the Arellano-Bond estimation is also suitable for $T < N$. Research data is equal to $35 * 11 = 385$ observations.

3.2 Research model

Based on the studies by Goodell (2020), Hardiyanti and Aziz (2021), Tiwu (2020), Žunić et al. (2021) and the financial accelerator theory, the research model is as follows:

$$npl_{i,t} = \beta_0 + \beta_1 Covid_t + \sum_{i=2}^{n} \beta_i control\_variables_{i,t} + \mu_{it} \quad (1)$$

Because of the endogeneity problem, pooled OLS, FEM and REM estimates are biased and inconsistent. Therefore, the endogeneity needs to be eliminated by applying Arellano-Bond's two-step system generalised method of moment (SGMM) estimation (Arellano and Bond, 1991) with valuable instrument variables. Hence, from model (1), it is modified in detail as follows [model (2)]:

$$\begin{aligned} npl_{i,t} = {} & \beta_0 + \beta_1 npl_{i,t-1} + \beta_2 covid_t + \beta_3 lev_{i,t} + \beta_4 car_{i,t} + \beta_5 ldr_{i,t} + \beta_6 llp_{i,t} \\ & \beta_7 gr\_loan_{i,t} + \beta_8 cir_{i,t} + \beta_9 inf_t + \beta_{10} gdp_t + \mu_{it} \end{aligned} \quad (2)$$

where

$npl_{i,t}$ non-performing loans of bank i at time t

$npl_{i,t-1}$ non-performing loans of bank i at time $t - 1$

$covid_t$ COVID-19 at time t

$lev_{i,t}$ leverage of bank i at time t

$car_{i,t}$ capital adequacy ratio of bank i at time t

$ldr_{i,t}$ loan to deposit ratio of bank i at time t

$llp_{i,t}$ loan loss provision of bank i at time t

$gr\_loan_{i,t}$ the growth of loans of bank i at time t compared to time $t - 1$

$cir_{i,t}$ cost to income ration of bank i at time t

inf_t inflation rate at time t

gdp_t gross domestic product at time t.

The details of variables in model (2) are presented in Table 1.

Table 1 Variables in the proposed model

STT	*Variable*	*Index*	*Calculation/source*	*Source(s)*
Dependent variable				
1	Non-performing loans	*npl*	$\frac{nonperforming\ loans_{i,t}}{total\ loans_{i,t}}$	
Instrument variable				
2	Latency of non-performing loans	npl_{it-1}	$\frac{nonperforming\ loans_{i,t-1}}{total\ loans_{i,t-1}}$	Ghosh (2015), Nguyen Kim (2020), Nguyen Thi (2017), Pham and Nguyen (2018), Trung (2019)
Independent variable				
3	COVID-19	*covid*	covid is dummy variable; covid = 1: the year has COVID-19; covid = 0 otherwise	Goodell (2020), Hardiyanti and Aziz (2021), Tiwu (2020), Žunić et al. (2021)
Control variable				
4	Leverage	*lev*	$\frac{total\ liabilities_{i,t}}{total\ equity_{i,t}}$	Nguyen Kim (2020), Nguyen Thi (2017), Pham and Nguyen (2018), Trung (2019)
5	Capital adequacy ratio	*car*	Financial statements	Koju et al. (2018), Nguyen Kim (2020), Nguyen Thi (2017), Pham and Nguyen (2018), Trung (2019), Yulianti et al. (2018)
6	Loan to deposit ratio	*ldr*	$\frac{total\ loans_{i,t}}{total\ deposits_{i,t}}$	Akwaa-Sekyi and Moreno Gené (2016), Mishkin (2012)
7	Loan loss provision	*llp*	Financial statements	Ghosh (2015), Radivojevic and Jovovic (2017)
8	Credit growth	*gr_loan*	$\frac{total\ loan_{i,t} - total\ loan_{i,t-1}}{total\ loan_{i,t-1}}$	Ghosh (2015), Radivojevic and Jovovic (2017)
9	Cost management	*cir*	Financial statements	DeYoung (1997), Lin and Zhang (2009), Louzis et al. (2012)
10	Inflation rate	*inf*	World Bank	Ghosh (2015), Klein (2013), Nguyen Kim (2020), Pham and Nguyen (2018), Škarica (2014)
11	Gross domestic product growth	*gdp*	World Bank	Chaibi and Ftiti (2015), Nguyen Kim (2020), Nguyen Thi (2017), Pham and Nguyen (2018), Reddy (2015), Trung (2019)

3.3 Methodology

Using qualitative (expert interviews, namely senior credit officers and credit managers' survey) aims to adjust and supplement the presence of variables that affect NPLs built in the proposed model. First, preliminary qualitative and quantitative research is conducted. The preliminary quantitative study calculated the expert consensus coefficient to generate strong evidence to support these variables' presence. According to Hayes and Krippendorff (2007), a consensus coefficient of 67% or even 60% is considered satisfactory if the results, such as objective decision interviews, are appropriately coded. Therefore, only those variables with an expert consensus rate of greater than 60% are retained for the analysis. Second, preliminary quantitative research is conducted based on the exchange with the experts. The results are then used as the basis of a survey among 50 credit management experts regarding those variables that affect NPLs in Vietnam. This step demonstrates that the variables that satisfied the expert consensus condition are COVID-19 and control variables include capital adequacy ratio, lag (NPLs), loan loss provision, loan to deposit ratio, credit growth, cost-to-income ratio, leverage ratio, GDP and inflation.

After the qualitative methods, the author applies quantitative research methods (SGMM) to estimate the effect of COVID-19 on NPLs at commercial banks in Vietnam. Given the lagged dependent variable and endogeneity, the least square estimator becomes biased and inconsistent. Therefore, the Arellano-Bond two-step difference SGMM estimator with robust standard errors is adopted (Arellano and Bond, 1991). The Arellano-Bond estimator uses the lag of dependent variables and the lagged exogenous variables' values as instrumental variables.

Moreover, one rule of thumb in GMM is that the "number of instruments should not be larger than the number of groups" (Roodman, 2009). AR(1) and AR(2) denoted the Arellano-Bond tests for the first-and second-order autocorrelation of the residuals. One should reject the null hypothesis of no first-order serial correlation and support the null hypothesis of no second-order serial correlation of the residuals.

4 Research results and discussion

4.1 Research results

Starting panel unit root tests to check whether the variables are stationary to guarantee the reliability of the regression results. The Fisher-type unit-root test (Choi, 2001) was performed to test the variables' stationary with the null hypothesis 'H0: All panels contain unit roots'. The results of the unit-root test for each variable are presented in Table 2.

The p-values recorded in the test are below the 5% level of statistical significance, so there is enough evidence to reject H0. It means that all variables are stationary at the base level (including the table mean and time trend – including panel mean and time trend). Therefore, estimating the model with the variables above can provide reliable regression results.

The descriptive statistics of all the variables are summarised in Table 3. The mean value of NPLs in Table 3 is 0.0233, with minimum and maximum values of 0.0001 and 0.1140, respectively. Also, its standard deviation is 0.0154. In the sample data, the

highest NPLs rate belongs to Saigon Joint SCB in 2010, and the lowest value came from Bao Viet Joint SCB – BVB (2010).

Table 2 Unit-root test

No.	*Variable*	*Inverse chi-squared(18) P*	*Inverse normal Z*	*Inverse logit t(49) L*	*Modified inv. chi-squared Pm*
1	*npl*	0.0000	0.0000	0.0000	0.0000
2	*covid*	0.0000	0.0000	0.0000	0.0000
3	*lev*	0.0000	0.0000	0.0000	0.0000
4	*car*	0.0000	0.0000	0.0000	0.0000
5	*ldr*	0.0000	0.0017	0.0012	0.0000
6	*llp*	0.0000	0.0000	0.0000	0.0000
7	*gr_loan*	0.0000	0.0000	0.0000	0.0000
8	*cir*	0.0000	0.0000	0.0000	0.0000
9	*inf*	0.0000	0.0008	0.0013	0.0000
10	*gdp*	0.0000	0.0000	0.0000	0.0000

Table 3 Descriptive statistics

Variable	*Obs.*	*Mean*	*Std. dev.*	*Min.*	*Max.*
npl	385	0.0233	0.0154	0.0001	0.1140
lev	385	11.1146	4.4644	2.0085	27.8760
ldr	385	0.9466	0.7642	0.3719	10.4129
llp	385	0.0135	0.0057	0.0029	0.0327
car	385	0.1441	0.0601	0.0640	0.4511
gr_loan	385	0.2960	0.2732	–0.2218	1.4806
cir	385	–0.5177	0.1337	–1.1152	–0.2251
inf	385	0.0721	0.0511	0.0060	0.1870
gdp	385	0.0601	0.0055	0.0520	0.0680
covid	385	0.1844	0.3883	0.0000	1.0000

The leverage factor takes the minimum and maximum values to be in the order of 2.0085 and 27.8760. The *covid* is a dummy variable, which has a maximum value of 1 and a minimum value of 0. COVID equals 1 indicates the year has had the COVID-19 pandemic, which is the year of 2019, 2020 and 2021.

The next section will present the regression results following the SGMM two-step method with one-year-lagged NPLs and instrumental variables to solve endogeneity. Table 4 presents the SGMM results with eight statistically significant variables because their p-values are greater than 5%.

Table 4 shows the p-value obtained from AR(2) is 0.711 which is higher than 5%, null hypothesis 'H0: No autocorrelation of order 2' is thereby supporting H0. Hence, we can conclude that no autocorrelation was detected in the model.

Moreover, the Sargan and Hansen tests in Table 4, which aim to detect an overidentifying restrictions problem related to the heterogeneity of the subsets of the instrumental variables and support the validity and reliability of the SGMM two-step

results. All the p-values are higher than 5%, therefore, no sufficient evidence could be found to reject Hypothesis H0.

Table 4 Two-step GMM estimation

npl_{it}	*SGMM*		
	Beta coefficient	*p-value*	*Decision on p-values*
npl_{it-1}	–0.308	0.008**	Accept
covid	0.171	0.000***	Accept
lev	–0.006	0.001***	Accept
car	–0.047	0.008**	Accept
ldr	0.001	0.246	Reject
llp	1.040	0.001***	Accept
gr_loan	–0.003	0.005**	Accept
cir	–0.002	0.172	Reject
inf	0.057	0.094	Reject
gdp	–0.002	0.000***	Accept
Arellano-Bond test for AR(1) in first differences: z = –1.15, Pr > z = 0.008			
Arellano-Bond test for AR(2) in first differences: z = –0.08, Pr > z = 0.711			
Sargan test of overid. restrictions: chi2(42) = 27.981, Prob. > chi2 = 0.806			
Hansen test of overid. restrictions: chi2(42) = 10.382, Prob. > chi2 = 1.000			
Number of instruments = 16			
Number of groups = 35			

Notes: Legend: *p < 0.05, **p < 0.01 and ***p < 0.001.
Where npl_{it-1} is the lag of non-performing loans, *covid* is COVID-19, *lev* is leverage ratio, *car* is capital adequacy ratio, *ldr* is loan to deposit ratio, *llp* is loan loss provision, *gr_loan* is loan growth, *cir* is cost to income ratio (cost management), *inf* is inflation rate and *gdp* is gross domestic product.

In addition, in this paper, the number of instruments is 16, which is less than the number of observations at 35 (Table 4). It means that the rule of thumb is satisfied (Almarzoqi et al., 2015; Roodman, 2009). Hence, the instrument variables adequately deal with the endogeneity.

4.2 Discussion

The findings show the positive relationship between COVID-19 and NPLs, which aligns with the proposed hypothesis that reached the 1% level of statistical significance under Arellano-Bond's two-step SGMM estimation. This demonstrates that the COVID-19 case is one sign of a natural disaster beyond human ability that affects commercial banks' NPL levels. Furthermore, the findings of this study are consistent with the studies by Hardiyanti and Aziz (2021) and Žunić et al. (2021).

On the platform of financial accelerator theory, the current findings have demonstrated that macroeconomic conditions or business cycles have significantly impacted NPLs. Testing for the existence of a financial accelerator raises, Carey (2002) argues that changes in macroeconomic conditions are the most critical factor affecting

bank losses. When a macroeconomic shock occurs, the customers' net asset value (net worth) decreases (Ćorić, 2011; de Groot, 2018; Lee et al., 2022). Because of the decrease in the borrowers' collateral values, the probability of the occurrence NPLs increases. Thus, from the initial shock in the economy, the credit market is affected and reduces credit activity (Bernanke et al., 1996; Bernanke and Gertler, 1986). Therefore, economic shock or COVID-19 factors can lead to an increase in NPLs.

In Vietnam, based on the General Statistics Office's Reports 2020, the banking system's credit growth in 2020 will reach 10.14%, lower than the 12.14% in 2019, but this is still the lowest growth rate from 2013 to 2020. The banking system's NPL ratio in 2019–2021 (% of total outstanding loans) is 1.6%, 1.7% and 1.9%. In order to limit the increase in NPLs in the following years because of the late impact of COVID-19, the Vietnamese Government has issued policies to support customers facing difficulties. Specifically, on March 4, 2020, the government issued a credit package worth VND 250,000 billion according to the Directive 11/CT-TTg of the Prime Minister (urgent solution to remove difficulties for production and business, ensuring social security in response to the COVID-19 epidemic). On March 13, 2020, the government issued Circular 01/2020/TT-NHNN stipulating that credit institutions and foreign bank branches restructure debt repayment terms, exempt or reduce interest (including service fees), and maintain the debt group to support customers affected by the COVID-19 epidemic. On March 17, 2020, the SBV cut the policy interest rate by 100 basis points. On April 8, 2020, the government issued a fiscal support package by deferring tax payments and social insurance (about 1% of GDP). On September 9, 2021, the government issued Resolution 105/NQ-CP on supporting businesses, cooperatives, and business households in the context of the COVID-19 epidemic. Besides, to facilitate loans for businesses, the SBV needs to provide a detailed guideline framework and propose responsibilities for each agency to coordinate to support businesses, ensuring that the right customers receive support packages at an incentive interest rate. In addition, the SBV needs to inspect the debt restructuring strictly, and require commercial banks to report the quantity, the limitation, and the reason for the extension of the loan terms, to ensure that the support policy is objective, transparent, and applied using the suitable object. Moreover, for small and medium-sized enterprises, which are also affected by the pandemic, SBV should continue to have a policy of extending debt and reducing lending interest rates for them. Besides, fiscal policy should be strengthened to stimulate demand and promote economic growth.

5 Conclusions and limitations

This study highlights the relationship between COVID-19 and NPLs at commercial banks in Vietnam. By using the qualitative and quantitative methods, the direct relationship is explained under the financial accelerator theory. The model is estimated reliably and with no bias, and COVID-19, reached the 1% level of statistical significance under two-step SGMM estimation.

The global financial crisis and the COVID-19 pandemic are macroeconomic problems that are difficult for banks to assess. So, to limit and predict their consequence to the economy and banking system, commercial banks need the technique and tools of risk assessment applied by professional institutions and government agencies. To control and monitor NPLs, Vietnam State Bank requests commercial banks' credit granting

policies corresponding with the law of credit institutions and financial policies. Under management by the state bank, it is required that commercial banks comply with monetary policies to curb high credit growth and limit risk-taking by banks under each economic condition. Besides, policymakers should ensure that banks assess the current values of loans as correctly as possible (Haynes et al., 2021) to avoid impaired loans.

Although some findings have been achieved in the paper, certain limitations still exist. First, the study does not mention the effect of the board of directors as a meditating or moderating factor to control NPLs. Second, the study needs to consider the cross-country data, especially in developing countries, to examine how different the effects of COVID-19 on NPLs. Finally, the COVID-19 factor could be measured by another proxy, such as number of people deaths, instead of dummy variable.

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Notes

1 According to State Bank of Vietnam [online] https://www.sbv.gov.vn (accessed 31 December 2021).