The Safety Threshold of Vietnam's Banks During Covid-19

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Abstract

Using the stress test, we measured the Comercial banks' withstand under pressure caused by the outbreak of COVID-19, which led to a freeze of the real estate market, a fall of the stock market, and an increase of non-performing loans (NPLs). The findings show positive and hopeful signs. Even though the real estate and stock markets fell by 40%, resulting in a significant devaluation of the banks' loan collaterals, banks do not need to supplement provisions for credit risk. The high number of NPLs, which lead to increased provisioning, erodes net earnings, reducing the capital adequacy ratio (CAR). Banks can still meet both the 9% minimum CAR requirement and the 3% maximum NPL requirement. The study also identifies the maximum safety threshold of the Vietnamese banking system, which averaged up to a 50% increase in NPLs. Two of the country's top 10 banks are even able to maintain a CAR greater than 9% and an NPL ratio below 3%, although NPLs increase to 450% and 215% compared to these before the shock, respectively.

1. INTRODUCTION

The massive global economic shock resulting from the COVID-19 crisis has placed unprecedented pressure on domestic economies worldwide, including Vietnam. Planning for the next "new normal" has become increasingly complex for all sectors. In addition to its role as an intermediary for transferring capital from lenders to borrowers, the banking industry is now undertaking greater responsibility by pioneering support for firms in other industries and communities through credit packages. This new role, adopted at the request of the State Bank of Vietnam and of the Governor through Circular 01/2020/TT-NHNN,

is, however, a double-edged sword. The support by Vietnamese commercial banks, including Vietcombank, Vietinbank, BIDV, Eximbank, and TPbank, for restructuring loans, reducing lending rates, extending repayment periods, removing overdue penalty interest rates, etc., risks an increase of non-performing loans (NPLs). The impact of COVID-19 on the real estate market, the main collateral for most bank loans, aggravates this prospect. Therefore, credit risk stress testing has become essential for banks to promptly identify and respond to the crisis.

The purpose of this paper is to determine how Vietnamese commercial banks can overcome the most serious credit shocks of the COVID-19 crisis. To do so, we designed three types of shocks with corresponding scenarios based on the dynamic of the pandemic in Vietnam, on the situation in those countries most affected by COVID-19, including China, the U.S., South Korea, and Italy, and on the opinions of experts gleaned through workshops, publications and direct consultations. Because COVID-19 has disrupted trends in the data structure and therefore affected the validity of predictions, we designed the scenarios primarily based on expert judgments rather than using macro scenarios or forecasting models that are based on historical data. Furthermore, in its review of forecasting methods, the International Monetary Fund has confirmed that expert forecasts provide more precise results (Blaschke et al., 2001; Genberg et al., 2014; Moretti et al., 2009). The analysis is conducted by a stress-testing framework on bank's balance sheets as suggested by many researchers (Acharya et al., 2018; Başarır & Toraman, 2014; Bird et al., 2015; Cornett et al., 2020; Cortés et al., 2020; Covas, 2018; Fernandes et al., 2020; Flannery et al., 2017; Frame et al., 2015; Goldstein & Leitner, 2018; Judge, 2020; Kapinos et al., 2015). The use of Stress tests in the time of Covid 19 has become more and more needed because, in the short term, such stress tests can support the assessment of the pandemic's impact at an aggregate level (Baudino, 2020; Baudino et al., 2018; Borio & Restoy, 2020; Lewrick et al., 2020).

The results aim to assess the resilience of banks when facing credit shocks caused by the COVID-19 crisis, including the probability of an increase in NPLs, a devaluation of collaterals or both. The study also intends to determine the maximum safety threshold that banks can withstand in the face of these risks. Based on the results, we propose recommendations for the banking system to ensure the ease and safety of financial operations. The results could also be used as resources for banks in managing credit risks in relation to the goals of capital adequacy and NPLs, specifically that the capital adequacy ratio (CAR) is equal or greater to 9% and a 3% NPL maximum. This paper may also be a resource for policymakers looking for timely solutions to uncertainties.

To our knowledge, this might be the first and the most updated research in the time of Covid-19; therefore, it provides a significant academic contribution. The three scenarios developed by ourselves might be helpful for further studies. Our scenarios are designed based on the natural shocks seen in the time of Covid19 but have never been seen precedently. Furthermore, our scenarios comprise simultaneously shock on the real state markets, the stock market, which is strongly linked to banking credit activities. The paper is structured as follows. Section 2 briefly describes how we design the scenarios. Sections 3 and 4 present the data collection method and empirical results, respectively. The paper wraps up in Section 5 with conclusions.

2. METHOD, DATA, AND ANALYSIS

Design the scenarios

In order to test the maximum strength of Vietnam's banks, the credit shock scenarios are based on the assumptions that the COVID-19 pandemic is either unable to be controlled in Vietnam or is under control, but there is a cessation of commercial activities. Each of the three scenarios will test bank endurance with two approaches: the leading figures recorded in Vietnam's history and the maximum safety threshold that banks are expected to withstand.

Shock one: Under-provisioning

The first shock occurs when the value of collaterals declines due to contractions in the real estate and stock markets. Lending practices rely to a significant extent on these two markets for collateral in Vietnam. Real estate collaterals make up an average of 58.65% (with a maximum of 93%), and securities make up an average of 11.02% (with a maximum of 20.90%) of outstanding loans. The most significant decrease of the VNIndex in terms of amplitude was 6.28% in 2014, while Vietnam's real estate market suffered an average 40% loss in value in 2006. Accordingly, we chose these two losses in value for the real estate and security markets in Scenario 1A. For the worst possible situation, Scenario 1B, we replicate the worst performance of China's markets, when prices fall 40%. It is important to note that this scenario may not appear likely in Vietnam at the moment as there is no sign of a devaluation of Vietnam's real estate market. Nevertheless, testing this scenario is still worthwhile to estimate banks' safety threshold.

Shock two: Proportional increase in NPLs

The second shock is an increase in NPLs due to difficulties in the economy caused by COVID-19 and the corresponding reduction in the quality of bank loans. By mid-April 2020, over 23% of the entire banking system's outstanding loan portfolio had been negatively affected by the COVID-19 crisis. Banking experts predicted that banks' risk of bad debts would soar in 2020 to at least 0.5-1% of outstanding loans and that the NPL ratio could reach 3.7% by the end of the year and even higher in subsequent years. The highest rate of NPLs previously experienced in Vietnam was 4.86% in 2012, representing an annual increase of 3.23%. Therefore, we use the maximum ratio of 3.7% to build Scenario 2A of the second shock.

In order to determine the maximum tolerance of Vietnamese commercial banks, the study pushes the increase of NPLs up to 50% in Scenario 2B. Scenario 2C takes the NPL situation even further by considering specific loan structures. For instance, we assume that NPLs increase for three consecutive months, which causes a change in the group of loans from performing loans (Groups 1 and 2) to NPLs (Groups 3, 4, and 5). In particular, 20% of the loans in Group 1 would be moved to Group 2, while the rest remain unchanged due to the loan rescheduling policy. 100% of the loans in Group 2 would be moved to Group 3, and so on. In addition to the increase of NPLs, the banks also raise their capital provisions for loans. Based on these scenarios, provisions of the additional NPLs would expect to be 100% in all cases.

Shock three: Integrated shocks

The third shock combines the first two: a decrease in collateral values and loan quality due to the weakening real estate and security markets. This is considered the worst-case stress test that the Vietnamese commercial banks might face, the results of which are expected to confirm the outcomes of shocks one and two.

All the scenarios satisfy some of the following principles: (i) they must reflect current conditions in Vietnam; (ii) the assumptions must be transparent; (iii) the sensitivity of the results following the assumptions must also be transparent; and (iv) the scenarios must be likely to occur.

In short, the scenarios used in this study reflect past events and are predictable for the future. They are also both atypical and eventual, meeting the two criteria of a stress test. They are summarized below in Table 1.

Table 1. Scenario stress testing for credit shocks

Shocks	Scenario	Items	Ratio	Note
Shock 1 Under provisioning	Scenario 1A	Devaluation of collaterals	40%	Scenario-based on historical events (in maximum)
		Decrease in value of stock market	6.3%	
	Scenario 1B	Devaluation of collaterals	40%	Scenario for testing safety threshold (in maximum)
		Decrease in value of stock market	40%	
Shock 2 Proportional increase in NPLs	Scenario 2A	Increase in NPLs	3.7%	
		Provisions of the additional NPLs	100%	
	Scenario 2B	Increase in NPLs	50%	
		Provisions of the additional NPLs	100%	100%
	Scenario 2C	Increase in NPLs		Group 1: 80% loans in Group 1 Group 2: 20% loans in Group 1 Group 3: 100% loans in Group 2 Group 4: 100% loans in Group 3 Group 5: 100% loans in Group 4 + 100% loans in Group 5
		Provisions of additional NPLs	100%	
Shock 3 Integrated shocks	Scenario 3	Devaluation of collaterals	40%	
		Decrease in value of stock market	40%	
		Increase in NPLs	50%	
		Provisions of additional NPLs	100%	

Source: Synthesized by the authors

Data

We collected the data of 10 Vietnamese commercial banks (see a full list in Appendix A) from 2019 audited financial statements to test the extent of the banks' resilience in the face of credit shocks. We chose these banks because they are 10/18 banks that have passed Basel II standards in terms of their CAR and have enough available data for stress testing. In addition, the total assets of the ten banks make up nearly 70% of Vietnam's entire banking system. The results, therefore, can be considered to partially reflect the level of the credit risk of the country's whole banking system.

The financial status of the banks in our study is shown in Table 2 below. All of them meet the CAR requirement according to Basel II, and all, except the BIDV, meet the CAR requirement of Basel III. Their NPL ratios are under 3%, while VPB's is 3.42%.

Table 2. CAR and NPL pre-shock ratios

Banks	CARs pre-shock	NPL pre-shock ratios	Status		Status
			CAR ≥ 8%	CAR ≥ 9%	NPL ratio ≤ 3%
VCB	9.34%	0.80%	Safe	Safe	Safe
BID	8.77%	1.75%	Safe	**Unsafe**	Safe
CTG	9.30%	1.16%	Safe	Safe	Safe
ACB	10.91%	0.54%	Safe	Safe	Safe
HDB	11.20%	1.36%	Safe	Safe	Safe
MBB	10.12%	1.17%	Safe	Safe	Safe
TCB	15.50%	1.33%	Safe	Safe	Safe
STB	11.53%	1.94%	Safe	Safe	Safe
VPB	11.10%	3.42%	Safe	Safe	**Unsafe**
VBB	9.14%	1.32%	Safe	Safe	Safe

Notes: The status of banks that meet the CAR or the NPLs ratio requirements are "safe"; those that do not are "unsafe."

Source: Calculated by the authors

3.   RESULTS AND DISCUSSION

The results of our study indicate that, in Scenarios 1A and 1B of the under-provisioning shock, the Vietnamese banking system does not need to supplement provisions for credit risk nor require additional collaterals from borrowers. Under these scenarios, the real estate market would devaluate up to 40%, and the stock market would fall by 40%, causing a severe devaluation of bank loan collaterals (see Table 3 and Table 4). In Vietnamese lending practices, collaterals are essentially a prerequisite for credit appraisal. According to 2019 statistics, before the COVID-19 pandemic, the highest collateral-to-loan ratio of the entire banking system was 3.16, with the average and minimum ratios of 2.31 and 1.47, respectively. After the under-provisioning shock in scenarios 1A and 1B, the banks still maintain a ratio greater than 1:1; that is, VND 1 of loan is guaranteed by VND 1 or more of assets. At 2.84%, MBB has the highest ratio, while BIDV has the lowest ratio at 1.18%. The average collateral-to-loan ratio is 1.92%. The banks' CAR, therefore, is the same as pre-shock levels. Because this shock assumes that NPLs are unchanged, there is no difference between NPL ratios post-shock and pre-shock.

Paradoxically, the particularly high collateral-coverage ratio in both pre-shock and post-shock, which is normally criticized as a significant barrier to credit access, turns out to be an excellent shield for the banks during the COVID-19 crisis, protecting banks from market uncertainties as capital quickly leaves the stock market, and the real estate market freezes.

Table 3. Stress test results of Scenario 1A

Banks	CAR post-shock	NPL ratio post-shock	Status		Status
			CAR ≥ 8%	CAR ≥ 9%	NPL ratio ≤ 3%
VCB	9.34%	0.80%	Safe	Safe	Safe
BID	8.77%	1.75%	Safe	**Unsafe**	Safe

Banks	CAR post-shock	NPL ratio post-shock	Status		Status
			CAR ≥ 8%	CAR ≥ 9%	NPL ratio ≤ 3%
CTG	9.30%	1.16%	Safe	Safe	Safe
ACB	10.91%	0.54%	Safe	Safe	Safe
HDB	11.20%	1.36%	Safe	Safe	Safe
MBB	10.12%	1.17%	Safe	Safe	Safe
TCB	15.50%	1.33%	Safe	Safe	Safe
STB	11.53%	1.94%	Safe	Safe	Safe
VPB	11.10%	3.42%	Safe	Safe	**Unsafe**
VBB	9.14%	1.32%	Safe	Safe	Safe

Source: Calculated by the authors

Table 4. Stress test results of Scenario 1B

Banks	CAR post-shock	NPL ratio post-shock	Status		Status
			CAR ≥ 8%	CAR ≥ 9%	NPL ratio ≤ 3%
VCB	9.34%	0.80%	Safe	Safe	Safe
BID	8.77%	1.75%	Safe	**Unsafe**	Safe
CTG	9.30%	1.16%	Safe	Safe	Safe
ACB	10.91%	0.54%	Safe	Safe	Safe
HDB	11.20%	1.36%	Safe	Safe	Safe
MBB	10.12%	1.17%	Safe	Safe	Safe
TCB	15.50%	1.33%	Safe	Safe	Safe
STB	11.53%	1.94%	Safe	Safe	Safe
VPB	11.10%	3.42%	Safe	Safe	**Unsafe**
VBB	9.14%	1.32%	Safe	Safe	Safe

Source: Calculated by the authors

Regarding shock 2A, if the increase in NPLs reaches 3.23%, the highest level recorded in Vietnam's history, the results are very positive (see Table 5). First, the change in the CAR post-shock is relatively low, indicating a negligible effect. Second, all banks maintain a CAR greater than 8%, satisfying the Basel II requirement. In Basel III, a BID is the only bank that does not meet the CAR requirement of greater than 9%. Finally, nine of the ten banks maintain an NPL ratio lower than 3%. Only VPB is higher, at 3.53%. Taken together, this indicates that Vietnamese commercial banks are in a better position than before the pandemic and can easily overcome one of the worst shocks in history.

The results are surprisingly optimistic, even when the NPL increases to 50% in shock 2B (see Table 6). BID, CTG, and VBB have a CAR lower than 9%, with BID requiring special supervision with a CAR below 8%, at 7.75%. Only VPB does not meet the NPL ratio requirement; its ratio is at 3.53% and 5.13% when the NPLs increase by 3.23% and 50%, respectively.

Table 5. Stress test results of scenario 2A

Banks	CAR post-shock	NPL ratio post-shock	Status	Status	Status
			CAR ≥ 8%	CAR ≥ 9%	NPL ratio ≤ 3%
VCB	9.32%	0.82%	Safe	Safe	Safe
BID	8.71%	1.80%	Safe	**Unsafe**	Safe
CTG	9.26%	1.19%	Safe	Safe	Safe
ACB	10.89%	0.56%	Safe	Safe	Safe
HDB	11.17%	1.41%	Safe	Safe	Safe
MBB	10.10%	1.21%	Safe	Safe	Safe
TCB	15.48%	1.38%	Safe	Safe	Safe
STB	11.46%	2.00%	Safe	Safe	Safe
VPB	11.03%	3.53%	Safe	Safe	**Unsafe**
VBB	9.11%	1.36%	Safe	Safe	Safe

Source: Calculated by the authors

Table 6. Stress test results of scenario 2B

Banks	CAR post-shock	NPL ratio post-shock	Status	Status	Status
			CAR ≥ 8%	CAR ≥ 9%	NPL ratio ≤ 3%
VCB	9.04%	1.19%	Safe	Safe	Safe
BID	7.75%	2.62%	**Unsafe**	**Unsafe**	Safe
CTG	8.71%	1.73%	Safe	**Unsafe**	Safe
ACB	10.66%	0.81%	Safe	Safe	Safe
HDB	10.71%	2.05%	Safe	Safe	Safe
MBB	9.79%	1.76%	Safe	Safe	Safe
TCB	15.17%	2.00%	Safe	Safe	Safe
STB	10.42%	2.91%	Safe	Safe	Safe
VPB	10.06%	5.13%	Safe	Safe	**Unsafe**
VBB	8.69%	1.98%	Safe	**Unsafe**	Safe

Source: Calculated by the authors

For Scenario 2C of the proportional increase in NPL shock, with the exception of BID and VPB, all banks are safe in both criteria: the CAR post-shock is equal to or greater than 8%, and the NPL ratio is equal to or less than 3% (see Table 7). BID always fails the CAR and NPL ratio requirements, while VPB's NPL ratio is greater than 5%.

Table 7. Stress test results of scenario 2C

Banks	CAR post-shock	NPL ratio post-shock	Status	Status	Status
			CAR ≥ 8%	CAR ≥ 9%	NPL ratio ≤ 3%
VCB	9.59%	1.14%	Safe	Safe	Safe
BID	6.82%	3.98%	**Unsafe**	**Unsafe**	**Unsafe**
CTG	9.33%	1.76%	Safe	Safe	Safe
ACB	10.88%	0.78%	Safe	Safe	Safe

Banks	CAR post-shock	NPL ratio post-shock	Status		Status
			CAR ≥ 8%	CAR ≥ 9%	NPL ratio ≤ 3%
HDB	10.33%	2.94%	Safe	Safe	Safe
MBB	9.77%	2.34%	Safe	Safe	Safe
TCB	15.31%	2.25%	Safe	Safe	Safe
STB	11.90%	2.22%	Safe	Safe	Safe
VPB	8.68%	8.18%	Safe	**Unsafe**	**Unsafe**
VBB	8.89%	1.78%	Safe	**Unsafe**	Safe

Source: Calculated by the authors

Shock 3 integrates the under-provisioning of collaterals and the increase of NPLs to test the banks' tolerance when facing double shocks. The results, interestingly, are the same as for the individual shocks; BID fails the CAR requirement, and VPB has an NPL of greater than 5% of total outstanding loans (see Table 8).

Table 8. Stress test results of scenario 3

Banks	CAR post-shock	NPL ratio post-shock	Status		Status
			CAR ≥ 8%	CAR ≥ 9%	NPL ratio ≤ 3%
VCB	9.04%	1.19%	Safe	Safe	Safe
BID	7.75%	2.62%	**Unsafe**	**Unsafe**	Safe
CTG	8.71%	1.73%	Safe	**Unsafe**	Safe
ACB	10.66%	0.81%	Safe	Safe	Safe
HDB	10.71%	2.05%	Safe	Safe	Safe
MBB	9.79%	1.76%	Safe	Safe	Safe
TCB	15.17%	2.00%	Safe	Safe	Safe
STB	10.42%	2.91%	Safe	Safe	Safe
VPB	10.06%	5.13%	Safe	Safe	**Unsafe**
VBB	8.69%	1.98%	Safe	**Unsafe**	Safe

Source: Calculated by the authors

4.   CONCLUSION, LIMITATIONS, AND SUGGESTIONS

This study confirms the health of the Vietnamese banking system, which proves to be resilient under different scenarios in the face of the COVID-19 pandemic. The scenarios are based on the real financial effects of the pandemic and the opinions of industry experts. Our findings indicate that when real estate and stock prices fall by 40%, all banks guarantee their CAR above 8%. With the shock of NPLs increasing to a high of 50%, banks still ensure a CAR above 8%, and the NPL ratio is kept below 3%. This strength comes from the banks' lending practices based on collaterals and the loan rescheduling policy.

The study suggests that BID is a potential problem. Although it has the largest credit market share in the system, the BID is the only bank that falls into the "unsafe" situation in all scenarios. This raises concerns about the health and efficiency of state-owned banks and requires further research.

The study also points out that stress tests, being forward-looking assessments of banks' resilience, represent a valuable toolkit to assess banks' conditions even under the Covid-19 pandemic circumstances. As the Covid-19 pandemic impact is better understood, policymakers can achieve the necessary balance between keeping banks safe and sound and ensuring an adequate flow of credit to the real economy (Baudino, 2020; Ikeda et al., 2021). However, adjusting such complex scenarios to use as a regular stress test is quite complicated. This issue is the limitation of this study and requires further research.

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Appendix
List of commercial banks that are tested to credit shocks

No.	Stock ID	Bank name
1	VCB	Joint Stock Commercial Bank for Foreign Trade of Vietnam
2	CTG	Vietnam Joint Stock Commercial Bank for Industry & Trade
3	BID	Joint Stock Commercial Bank for Investment & Development of Vietnam
4	ACB	Asia Joint Stock Commercial Bank
5	TCB	VN Technological & Commercial Joint Stock Bank
6	STB	Sai Gon Thuong Tin Joint Stock Commercial Bank
7	VPB	VN Prosperity Joint Stock Commercial Bank
8	MBB	Military Joint Stock Commercial Bank
9	HDB	Ho Chi Minh Development Joint Stock Commercial Bank
10	VBB	Vietnam Thuong Tin Commercial Joint Stock Bank

Source: Synthesized by the authors