AN EVALUATION ON STABILITY OF COMMERCIAL BANKS IN VIETNAM THROUGH FINANCIAL STABILITY INDICATORS AND BANKRUPTCY RISK SCORE

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Abstract

Recently, in Vietnam, financial stability has always been regarded as the priority. In particular, maintaining the stability of banking system plays such a significant role in stabilizing macro-finance. Under the impact of widespread and intensive economic integration, Vietnam's commercial banking system in recent years has experienced various changes. In fact, financial instability appeared due to stumbling blocks of financial market in general and banking system itself in particular. Especially, in the post-crisis period, Vietnam's commercial banking system confronted high risk of breakdown due to influences from external factors including global economic recession, and macro-economic instability as well as internal factors namely poor management capability and ethical risks, etc. This paper explores instability of Vietnam's commercial banking system from 2015 to 2018 based on the utilization of financial stability indicators (FSIs) and bankruptcy score (Z-score) in order to propose essential evaluation.

Keywords: *Bankruptcy score, Financial stability indicators, Fiscal policy, Monetary policy.*

1. Introduction

1.1. The necessity of the research

The process of international economic integration has brought many development opportunities but also made financial markets become complicated and risky. Over the past 20 years, the world has witnessed many large-scale financial-monetary crises. The losses that these crises have caused to the economy are extremely serious. Consequently, ensuring macroeconomic stability, especially stability of banking system, is becoming an important goal in the monetary policy conducting of central banks and governments in many countries around the world. This paper explores instability of Vietnam's commercial banking system from 2015 to 2018 based on the utilization of financial stability indicators (FSIs) and bankruptcy score (Z-score) in order to propose essential evaluation.

1.2. Theoretical basis for financial stability and banking system stability

1.2.1. Definition, characteristics of financial stability and banking system stability

There have been different concepts about financial stability based on a close relationship between financial stability and banking system stability. Crockett (1997) associated banking instability with non-financial stress, which might cause damages in huge banks and bankruptcy in smaller ones. Consequently, banks with stable financial status were capable of satisfying their own responsibilities without any external support.

According to International Monetary Fund - IMF (2006), financial stability meant avoiding both the breakdown of great number of financial organizations and the interruption of financial intermediary function of banking system on the basis of payment, saving, credit distribution as well as efforts in supervising capital users and minimizing risks.

Borio (2003) explored financial stability with two major models, which based on micro and macro conservative elements. In particular, while micro conservative elements would help in decreasing bankruptcy possibility in each bank, macro ones should concentrate on economic system in general to reduce all negative impacts of the financial crisis. There have been certain studies demonstrating apparent findings related to those effects through the usage of loan loss provision out of total loan, and non-performing loan as measurement of credit risks which would put negative impacts on financial stability.

According to European Central Bank, ECB (2007), financial stability should refer to the status, of which the financial system would be comprised of financial intermediary, financial market and infrastructure being capable of handling risks and shocks caused by financial unbalance. This would lead to the decrease in possibility of breakdown of financial intermediary, which initially has negative impacts on saving distribution and investment.

1.2.2. Measurement of financial stability and banking system stability

Criteria for the evaluation of financial stability in general and each financial institution in particular: Financial stability indicators - FSIs have significant meaning in the evaluation of healthy of credit institutions. In 2006, IMF introduced financial stability indicators with 39 ones divided into two categories. Particularly, the first one would cover core indicators, including 12 ones related to banking area. The rest 27 indicators should belong to the second category with other banking indicators, which are linked with non-banking financial organizations, non-financial companies, households, financial market and real estate market. The introduction of non-banking indicators reflected the connection between financial sector and other real economic sectors, for example, disadvantages within enterprise sector illustrated by bank's loan portfolios might cause negative impact on financial stability.

In parallel with financial stability indicators published by IMF, ECB co-operated with the central banks of other country members in order to release measurement method

and collect macro-prudential indicators – MPIs to observe financial performance of the banks, which would help in identifying possible risks arising from financial sector, especially banking area.

According to Geršl and Heřmánek (2007), there were huge differences between indicators introduced by IMF and those applied by ECB. *Firstly*, MPIs would demonstrate more numbers than FSIs. Different supervised areas and categories revealed that MPIs made great efforts in identifying and measuring numerous influencing factors on financial stability of banking sector in the Europe. *Secondly*, most MPIs related to the banks were published based on integrated principle, which meant that indicators for the banks in a specific country should cover branches, subsidiaries and other financial organizations controlled by those banks in other European countries.

There have been other indicators reflecting banking stability, which helped in reflecting stability of the financial system. So far, academic materials have been inconsistent in identifying representative indicators for banking risks in order to define risky banks and risky behaviours of the banks. Therefore, a wider but more specific concept of risk based on Z-score was approached serving the evaluation on financial stability, and aggregate risks or bankruptcy of the banks. **Bankruptcy score** (Z-score) was introduced by Ed Ward I. Altman in 1968 in order to forecast bankruptcy possibility of the banks and enterprises in the future. Additionally, Z-score was also regarded as a useful tool to identify fraud in financial statements. According to Altman (1968), managers might use Z-Score model to predict managing problems, especially those related to financial management in order to make timely decisions so that they could tackle arising matters, which might result in bankruptcy. At first, this study could forecast just 72% of bankruptcy possibility of a particular bank. Also, Z-score was created to give prediction of manufacturing companies. However, there were series of studies following this model. In the work by Altman (2000), Z-Score could help in the prediction of non-manufacturing companies. Altman and Hotchkiss (2006) researched changes of Z-Score to provide accurate prediction for most kinds of enterprises and financial sectors.

In order to be used for the prediction of bankruptcy, Z-score formula should be shown as the following:

$$Z\text{-}score = \frac{ROA + EA}{\sigma(ROA)}$$

ROA meant return on assets, EA meant equity-to-asset and σ (ROA) meant standard deviation of ROA. The greater the Z-score was, the more possibility of high financial stability or low aggregate risks. This score would be completely based on accounting data, illustrating the number of standard deviation of interest, at which if expected ROA value

decreased, the equity would be dried up and it would be impossible for the banks to pay. This score also considered three important aspects in the evaluation on banks' performance, including capital adequacy ratio (CAR), profit and risks (reflected by standard deviation of ROA, or fluctuation of the profit) (Roy, 1952).

So far, Z-score has been regarded as an advisable representative indicator for aggregate risk of the banks, or a suggested tool for financial measurement because when this score decreases, the bankruptcy possibility would increase. According to Chiaramonte et, al. (2016), 76% of failure possibility of the banks could be predicted by well by Z-score. This score can be used to calculate risk-taking behaviour of the banks through their capitalization, profit and asset changes. These fluctuations would be appropriate with the evaluation of financial stability of the banks. Furthermore, another advantage of Z-score is its requirement of limited data and convenience to be calculated with available information on financial statements. This creates great priority for Z-score to be used in the evaluation of financial stability or aggregate risk of banking system in its development period.

2. Method

The authors used qualitative method through descriptive statistics; system observation method; analysis and synthesis method. In parallel, the financial indicators were used to analyse the financial and business situation of Vietnamese commercial banks. The secondary data was collected and synthesized from actual data in annual reports of Vietnamese commercial banks and the State Bank of Vietnam. In addition, data sources were also collected from official reports, official websites; scientific works related to the research topic.
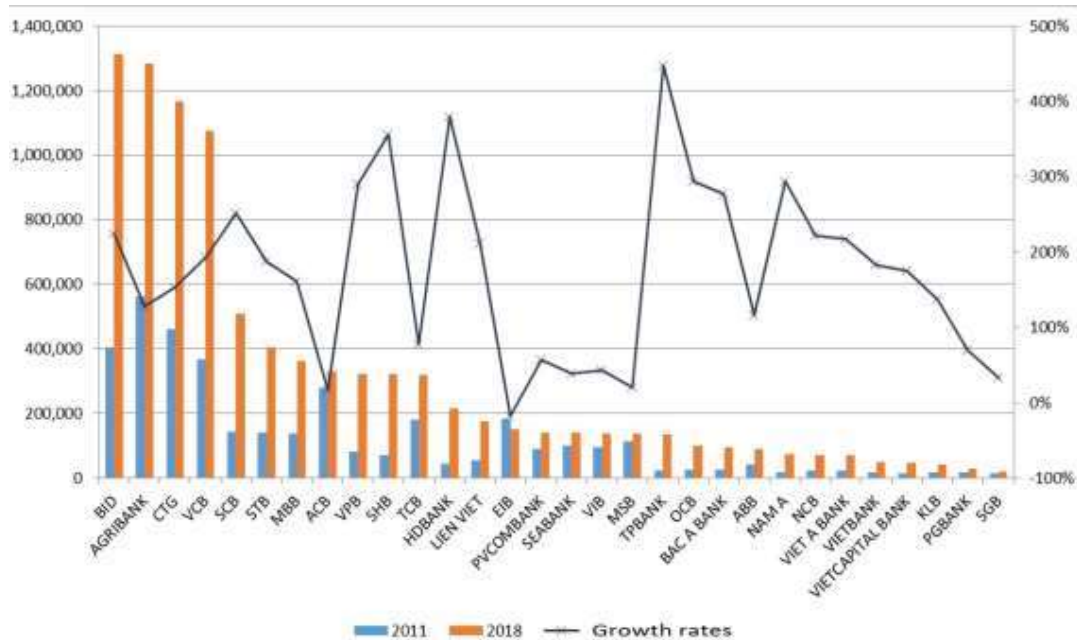
3. Results

3.1. Status of financial stability of commercial banking system in Vietnam based on FSIs

➢ Asset scale

In 2013, there were 4 commercial banks with asset scale accounting more than 10 billion USD. However, by the end of 2018, there had been 11 banks achieving total asset with 10 billion USD.

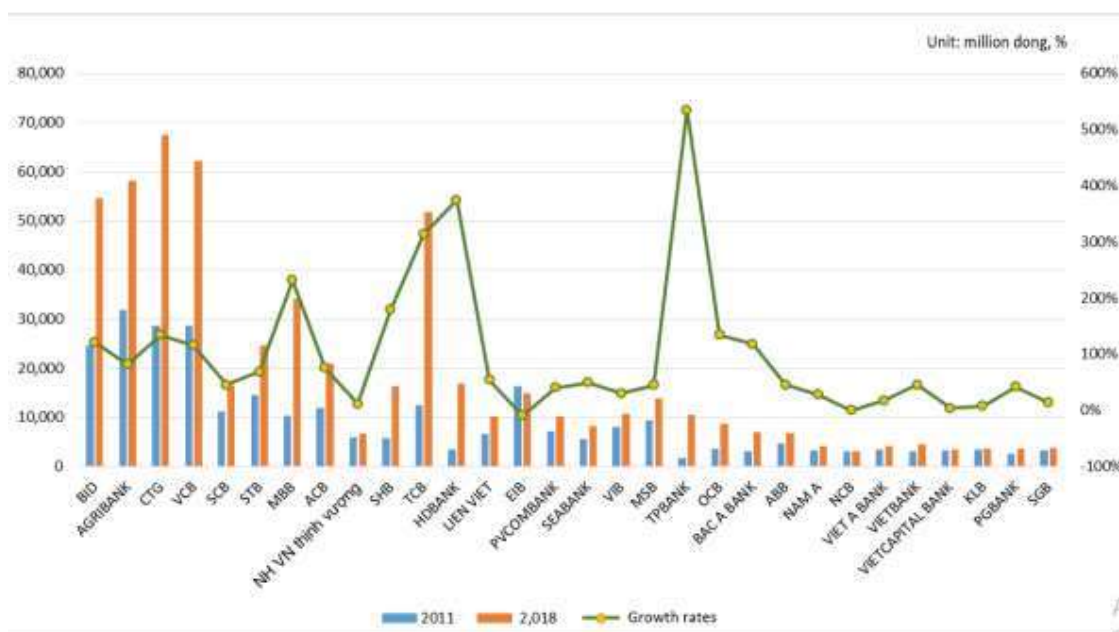**Figure 1: Total asset of commercial banks in Vietnam**

Most of these banks were those with great influence due to their market share accounting for 2/3 of deposit market and mobilization. In the past 5 years, the scale of credit organizations in Vietnam has been doubled. Total assets of Vietnam's credit organizations reached approximately 11 quadrillion at the end of 2018. Total asset of 30 banks at the end of 2018 was calculated at nearly 7,62 quadrillion, which increased by 10,35% compared with that number in the late of 2017.

➢ *Equity capital scale*

This is the condition and the basis for a commercial bank to identify its operating scale. Despite its small or even extremely small proportion of total capital, equity capital is compared with a "mattress", which can prevent risks for operating activities of the banks. Equity capital also contributes to CAR, especially when the application of Basel II is approaching. Banks applying regulations of CAR at pre-deadline time would be prioritized by the State bank for their credit growth in 2020. Therefore, pressure on capital increase appears in commercial banks to successfully increase their capital so that they can achieve Basel II prior to the deadline.

Figure 2: Equity capital scale of commercial banks in Vietnam

While total assets and equity capital of commercial banks have considerably grown up, the charter capital has slightly increased. By the end of 2018, charter capital of credit organizations in general had been supplemented with 152 trillion, of which, the number of charter capital of commercial banks accounted for the highest proportion with the best growth rate of 38% compared with that number at the end of 2013.

➢ *Capital mobilization scale*

In the past time, capital mobilizing activity of commercial banks in Vietnam has obtained considerable successes. Particularly, capital mobilization scale has experienced an upward trend through the years.

Table 1: Capital mobilization scale of commercial banks in Vietnam

Unit: Billion dong

No	Bank's name	2015	2016	2017	2018
1	Sacombank	259.428	302.806	325.461	370.136
2	SHB	127.353	181.153	210.921	243.420
3	VP Bank	152.131	172.438	236.781	277.851
4	SGB	14.088	15.202	17.622	16.634
5	SCB	225.978	295.152	353.327	418.338

6	VIB	75.698	96.774	114.372	128.499
7	Techcombank	142.240	173.449	175.435	207.678
8	BIDV	790.580	-	1.106.517	1.226.454
9	Vietcombank	503.642	600.738	726.734	823.390
10	Vietinbank	711.785	862.000	837.180	825.216
11	ACB	175.000	207.000	241.000	270.000

Source: Annual reports by Vietnamese commercial banks

The average capital mobilization structure of commercial banks in Vietnam in the period of 2015 - 2018 is illustrated in figure 3 below:

Unit: %
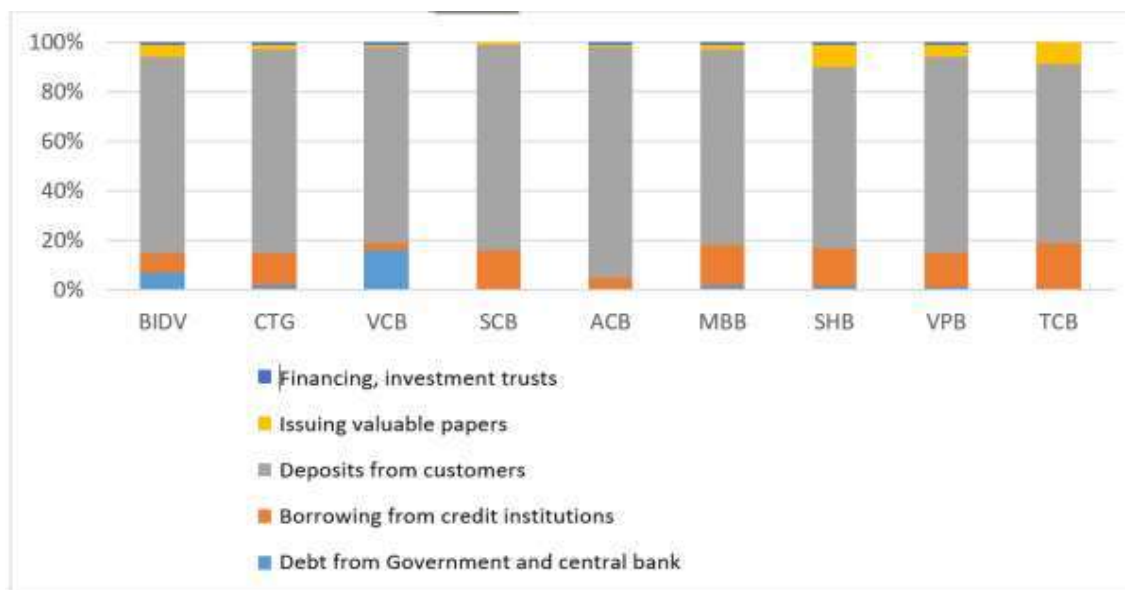
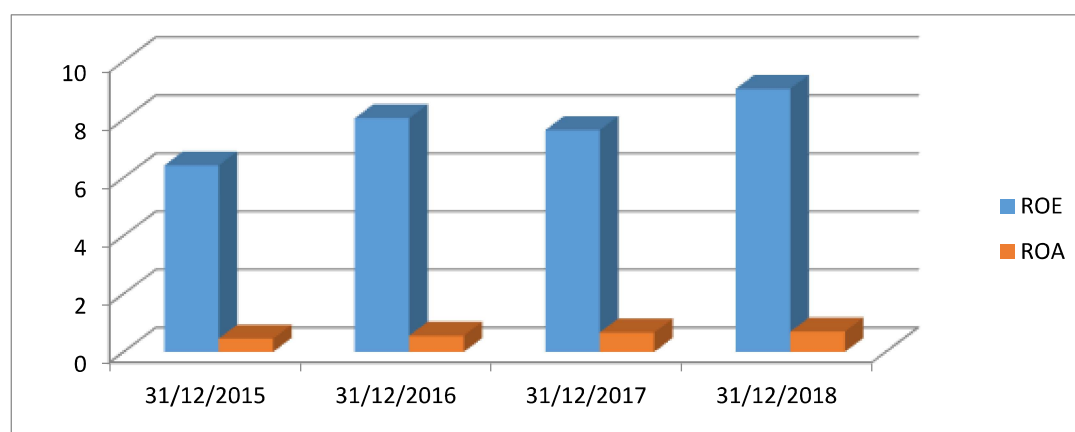*Source: Annual reports by Vietnamese commercial banks*

Figure 3: Capital mobilization structure of commercial banks in Vietnam

The above data reveals that capital mobilization source in the period of 2015 - 2018 concentrated mostly on customers' deposit. The second big capital source was loans from credit organizations and issue of commercial papers.

➢ *Profitability*

Profitability is an important factor noticed by both managers and investors because when the banks attain high profit, they can keep their capital source, attract investment and increase market share.

Source: Annual report by the State bank of Vietnam

Figure 4: ROA and ROE of commercial banks in Vietnam

Two criteria to evaluate profitability of the banks are so-called ROE and ROA. The number of ROA and ROE depends on banks' scale, risks and seasonal business period. ROA of joint stock commercial banks (0,76%) was higher than that of the state commercial banks (0,62%), that number of foreign joint-venture banks was 0,88%. ROA of the whole banking system in four recent years has been more stable, which increased from 0,46% in 2015 to 0,7% in 2018.

Table 2: ROA, ROE of certain commercial banks in Vietnam

Unit: %

Bank's name	ROA				ROE			
	2015	2016	2017	2018	2015	2016	2017	2018
STB	0,27	0,03	0,29	0,46	3,23	0,40	4,40	7,48
SHB	0,43	0,42	0,59	0,55	7,32	7,46	11,03	10,66
VPB	1,34	1,86	2,54	2,45	24,38	28,26	27,48	22,83
SGB	0,26	0,76	0,27	0,20	1,25	4,04	1,58	1,22
SCB	0,03	0,02	0,03	0,03	0,54	0,49	0,78	0,95
VIB	0,63	0,59	0,99	1,67	6,09	6,47	12,83	22,55
TCB	0,83	1,47	2,55	2,87	9,73	17,47	27,71	21,52
MBB	1,18	1,20	1,21	1,81	12,5	11,91	12,93	20,10
BID	0,84	0,66	0,61	0,59	16,97	14,62	15,34	15,08
VCB	0,85	0,93	1	1,39	12,03	14,70	18,10	25,18
CTG	0,79	0,78	0,73	0,48	10,28	11,64	12,03	8,30
ACB	0,54	0,61	0,82	1,67	8,17	9,87	14,08	27,73

Source: Annual reports by Vietnamese commercial banks

It can be seen that different banks experienced different growth rate of total assets and profit. Banks with small and medium scale obtained high ROA whereas public-owned banks maintained relatively low ROA compared with the average number of the sector. The rest banks mainly achieved the rate between 0,5% and below 1%. The group of banks with effective performance, creating great profit obtained ROA from 1% to 2%. However, it is noticeable for the banks that activities with higher profit will be in parallel with higher risks.

Especially, ROE was contrastive to ROA. Also, medium and large scale banks had higher ROE than small scale ones. Based on the Circular No. 41/2016/TT-NHNN, banks should keep increasing equity capital to satisfy CAR in 2018. However, the growth rate of equity capital of the banks was not the same as post-tax profit growth rate. Therefore, ROE was still at high rate. Noticeably, in three years from 2016 to 2018, huge banks shared the same trend of decreasing ROE. At the same time, certain ones with small capitalization grew up gradually and even at sudden number.

Although all the banks tried to achieve positive profit, their effectiveness of asset and capital source exploration was differentiated. In particular, 3 banks with state capital namely BIDV, VietinBank and Vietcombank were those with the biggest assets and equity capital. However, they were not those with the most effectiveness exploration of asset and equity capital. Indicators in the report showed that there were private-owned commercial banks performing great effectiveness of asset usage.

➢ *Outstanding debt, non-performing loan*

Table 3: Non-performing loan ratio of commercial banks in Vietnam

Unit: %

	Bank's name	Non-performing loan ratio			
		2015	2016	2017	2018
1	STB	1,86	6,91	4,67	2,11
2	SHB	1,72	1,88	1,90	2,4
3	VPB	2,69	2,91	3,39	3,51
4	SGB			2,98	2,20
5	EIB	186	2,95	2,27	1,84
6	VIB		2,58	2,64	2,52
7	TCB	1,67	1,58	1,61	1,75
8	MBB	1,61	1,32	1,20	1,32
9	BID	1,68	1,99	1,62	1,69
10	VCB	1,84	1,50	1,14	0,98
11	CTG	0,92	1,02	1,14	1,56
12	ACB	1,32	0,88	0,70	0,73

Source: Annual reports by Vietnamese commercial banks

In 2015, the rate of non-performing loan of banking system decreased at nearly 3% of debit balance. Particularly, 60% of non-performing loan was tackled by cash collection, disposition of property and increase in loss provision. In 2016, the rate of non-performing loan experienced an upward trend compared with that number in the late of 2015. Total non-performing loan grew up to more than 14.876 billion, equal to an increase by 43% compared with 2015. In 2017, the whole banking system significantly decreased the rate of non-performing loan from 11,9% to about 9,5% because potential non-performing loan was restructured, receivables were hard to be collected and corporate bonds decreased. Financial reports in 2017 of 13 huge and average banks in Vietnam showed that total non-performing loan was at 60.533 billion, slightly increasing by 0,7% compared with early months of the same year. In 2018, generally, non-performing loan was handled with dramatically decreasing react. Based on the report by the State Bank, by the end of December, 2018, all credit organizations resolved 149,22 trillion, the rate of non-performing loans within credit organizations was 1,89%, showing a decrease compared with 2,46% at the end of 2016 and 1,99% at the end of 2017.

➢ *Capital adequacy ratio (CAR)*

During two continuous years, 2015-2016, average number of CAR of banking system in Vietnam was greater than 9%, which followed the regulation. This number was obviously categorized among small and large scale banks. The former ones had higher CAR, whereas the latter one had smaller CAR. In 2016, it can be seen that there was no increase in CAR. However, banks' profit grew up positively. According to the report by the State bank, CAR of Vietnam's banking system was 12,84% in 2016, which was not much different from 2015 with 13%. Also, joint-venture and foreign banks had CAR at 33,2%, that number of state-owned commercial banks was 9,92%, and joint stock commercial banks was 11,8%.

Table 4: Capital adequacy ratio of certain commercial banks in Vietnam

(Unit: %)

No	Bank's name	2015	2016	2017	2018
1	Sacombank	10,96	9,61	11,30	11,9
2	SHB	11,40	13	13,00	11,88
3	VP Bank	12,20	13,20	14,60	12,3
4	SGB	15,23	15,72	14,07	14,03
5	VIB	18,04	13,25	13,07	12,9
6	TCB	14,74	6,18	12,73	14,3
7	MB	12,85	12,15	10,99	10,9
8	BIDV	9,81	9,50	10,90	10,3
9	Vietcombank	11,04	11,13	8,80	12,1
10	ACB	12,80	13,19	11,49	12,81

Source: Annual report by the State bank of Vietnam

Data by the State bank showed that at the end of January 2018, CAR of the banking system was 12,37%; this number on February 2019 was 11,8%, of which, CAR of state-owned commercial banks was 9,42% and that of joint stock commercial banks was 10,76%. Compared with the findings at the end of 2018, CAR of the whole system and that of two above groups decreased at the end of February 2019. Consolidation of reports by 20 commercial banks presented in annual meetings in 2019 demonstrated that there were 16/20 banks publishing CAR. Also, there were certain banks evaluating that their CAR in 2018 improved compared with the previous year. By the end of December 2018, CAR of all the banks had decreased compared with early months of the year. In particular, the lowest number belonged to banks with the state capital (9.52%) and joint stock ones (11.24%). In regard of joint stock commercial banks, pressure on capital increase was rather slight when they were capable of keeping post-tax profit. At the same time, CAR within these banks was at safer level than the state-owned ones.

3.2. Status of financial stability of Vietnam's commercial banks based on Z- score

The above analysis shows the status of financial stability of Vietnam's banking system through FSIs indicators including total assets, total capital source, equity capital scale, CAR, indicators reflecting operating competency like ROA, ROE and those reflecting possible risks such as non-performing loan, outstanding debt. Based on these findings, the author calculated data to show the average index for the whole banking system, which also includes Z-score.
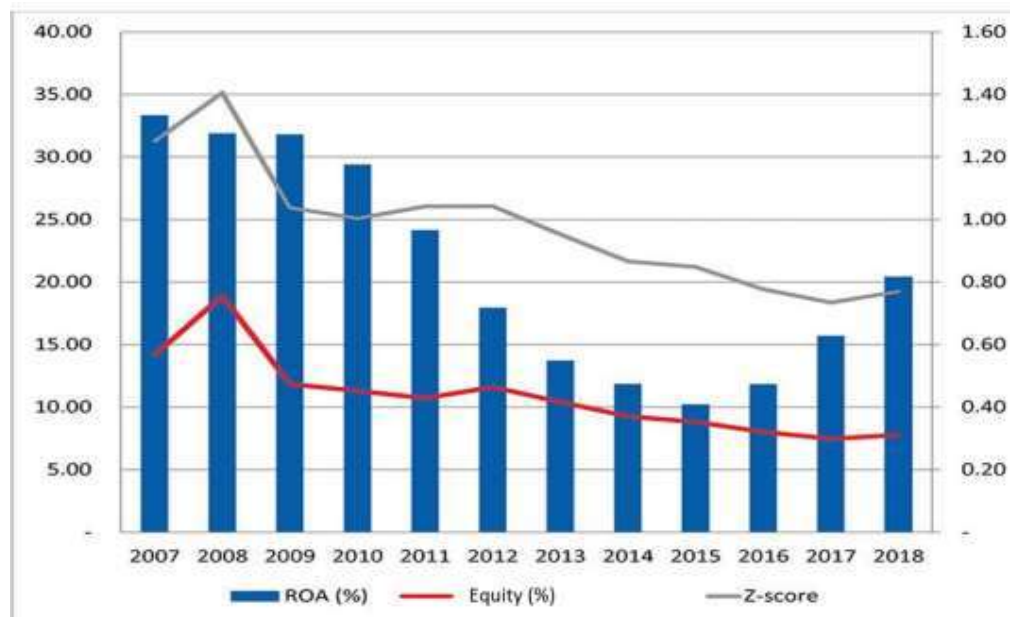
The statistical report is presented in table 5. It is obvious that operating performance, credit risks and capital adequacy of Vietnam's commercial banks have experienced great gaps with considerable differences between the extremes of measurement as well as huge deviation.

Table 5: Distribution value of indicators for the evaluation of stability of Vietnam's commercial banks

Indicators	Average	Standard deviation	Min Value	Max Value
ROA (%)	0,82	0,77	-5,51	5,95
Equity ratio (%)	10,75	7,42	3,25	80,83
Z-score	24,27	12,96	0,59	93,21
Provisioning rate (%)	1,27	0,62	0,00	3,97
NPLs ratio (%)	2,27	1,48	0,08	11,40

Source: Consolidation and calculation from annual reports by Vietnamese commercial banks

The above data states that ROA fluctuates from -5,51% to 5,95%, with the mean of 0,82%, showing deviation in terms of performance of Vietnam's commercial banks. The relatively low mean is appropriate with the status of initial development stage of banking system in Vietnam.

Figure 5. Financial stability of Vietnam's banking system based on Z-score

This figure reveals that Z-score dramatically decreased in 2008, when there was global financial crisis. This was partially distracted by the decline in ROA as analyzed above, which was an important part in the formula to calculate Z-score. However, it can be seen that the increase in benefit in 2015 was inadequate to create parallel rise in Z-score. This demonstrates that the increase in profit could not compensate for the poor capital buffer of the banks in this period. At the same time, although Vietnam's commercial banks were required to increase capital, especially in the context of Basel-based capital advocacy establishment; obstacles from too fast growth in credit and decreasing credit quality put pressure on the banks' capital buffer. Furthermore, the rise in capital within State-owned commercial banks was largely connected with the Government's managing direction and control. Therefore, it is possible that the continuously decreasing Z-score from 2008 better reflected the status of capital advocacy of Vietnam's commercial banks than fluctuations of comparative profit.

4. Discussion and Conclusion

Evaluation on stability of Vietnam's commercial banks based on financial stability indicator and Z- score.

Asset and equity capital: The equity capital to total asset ratio calculated for 25 commercial banks showed that the average number in 2017 and 2018 was 8,29%. Among these banks, there were 15 ones owning higher index than the average number of the group. The data stated that the equity to total asset ratio of three among four Big4 banks (Vietcombank, BIDV, Vietinbank) was smaller than the average number of the group. This reveals that huge banks were under the trend of using financial leverage with higher rate than equity capital. The reason for this was the banks' capability of attracting big deposit. Also, equity-to-assets ratio reflected a highly potential risk related to liquidity of the banks. In fact, the equity is the mattress to minimize shocks causing risks for the banks. So, if it is too weak compared with total capital source, the banks would find it difficult to satisfy liquidity. Despite their small equity-to-assets ratio, huge banks have good reputation, large capital scale, which would help them in stable performance and competency to confront strong economic changes. However, in regard of other banks, if the above ratio is too small, it would cause an alarming situation for the stability and development of Vietnam's commercial banking system.

Deposit: The ratio of total deposit to total outstanding balance for all the surveyed banks was 125,47%, of which, 15 banks achieved higher number than the average of the group. If compared with that ratio for Philippines and Indonesia (164,57% and 144,72% respectively), it can be seen that the above number for Vietnam's commercial banks was much lower than countries in the same region. This means that capital mobilized from deposit was not strong and huge enough to satisfy lending demand and payment of Vietnam's banks, which would result in instability in the operation of banking system in the case of unexpected affairs as well as impact on liquidity assurance of the banks.

Profitability: mean of ROA was calculated at 0,82%, which was lower than Philippines (1,28%) and Indonesia (1,87%). This means that ROA of commercial banks in Vietnam was weaker than other countries in the same region. There were 18 out of 25 surveyed banks having greater ROA than the average number of the group. In regard of ROE, with 15,80%, ROE of Vietnam was higher than Philippines 12,50%, although it was lower than that of Indonesia 17,51%. An insight into the banking system shows that there were 12 banks owning ROE higher than the average number of the group. This was compatible with banks in the research because when most huge commercial banks in Vietnam mobilized large loan, the ratio of equity to capital would be small, resulting in huge ROE.

Non-performing loans: The average ratio of non-performing loans to total debit balance was 2,27%, which was lower than Indonesia 2,57% and Philippines 3,56%. So, it can be stated that the status of credit risk and non-performing loans in Vietnam's commercial banking system was lower than that of other countries in the region. The fact that most large banks owning higher non-performing loans than the average rate revealed poor credit quality. This might be caused by pressure from credit growth, which led to poor concentration on project approval, review and returning capability of the borrowers.

Z-score*:* Mean Z-score 24,27 of Vietnam's commercial banks was at compatible rate with the average number of more than 1.000 commercial banks in 29 new emerging countries in the world. In particular, that number of banks in Middle and Eastern Europe, Latin America and Asia was 24,61 in the period of 2000-2012 (Chen et, al., 2017). However, when compared with banks in developed countries in European area, Z-score of commercial banks in Vietnam was lower. Specifically, Z-score of 20 developing countries in the Europe was 28,22 in the period of 2000–2015 (Brana et, al., 2019). Previous studies stated that banking system in developing countries was highly stable. At the same time, in new emerging and developing economies, the stability of the banks was demonstrated to be lower.

Statistics indicated that based in Z-score, the decline in capital buffer would probably be the most important influencing factor on the stability of Vietnam's commercial banks. In other words, if the banks were incapable of sponsoring for their supplementary instruments like CAR assurance, they would have difficulties in providing possible responses to tackle with any financial obstacles. By contrast, post-tax profit of the banks would not contribute much to the reflection of financial instability. At the same time, risks in lending activities might cause damages for stability of the banking system, which would have huge delay.

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