

Governance of Vietnam's Financial Institutions in Accordance with International Standards until 2020

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ABSTRACT

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In this article, using a combination of risk-related factors, we address the governance of financial institutions, mainly Vietnam's commercial banks, in light of such international standards as of Basel II and III. Additionally, we employ multiple regression approach to shed light on the effect of each type of risk on bank performance and propose a few recommendations for effectively governing the commercial banking system of Vietnam until 2020.

Keywords:

Financial institutions,
risk management, Basel
standards, Z-score.

1. Introduction

The activity of financial institutions governance is fundamental to efficient and safe operations of the financial system in the market economy (Rose, 2011). Effective administration of financial institutions helps meet the optimal cost of capital flow, thus enabling the economy to achieve potential production levels (Saundra & Marcia, 2012).

There has, as reported in the 2010 World Economic Forum, been a gradual shift to risk management in strategies of most countries as well as financial institutions across the world. Risk control is one key strategic objective in governing financial institutions; hence, appropriate and long-term risk management strategies should be defined from both macro (financial system) and micro (each financial institution's operation) perspectives. Remarked by KPMG (2012), the demand for risk management in Asian countries including Vietnam has become increasingly greater, particularly after the 2008 crisis. Currently, the Vietnam's financial system is in development; apart from such, increased non-performing loans overshadow commercial bank operations. Improving administration systems, therefore, should be imperative during the process of restructuring of the financial system in general and commercial banks in particular. In this respect this study is conducted to:

- (i) Approach the theories on risk-management-oriented governance of financial institutions and commercial banks;
- (ii) Investigate different kinds of bank risk and the reality of managing Vietnam's banking industry in accordance with Basel standards;
- (iii) Measure the effects of risk factors on bank performance using Z-score as a dependent variable; and
- (iv) Put forward solutions to effective governance of Vietnamese commercial banks until 2020.

2. Theoretical bases and review of previous studies

2.1. Theoretical framework

Evaluation of bank management activities based on CAMELS indicators was introduced in the 1970s by the US banking authorities, which was later extended to become a useful tool for supervision agencies in different countries to assess the soundness of financial institutions. The CAMELS model serves as a rating system,

monitoring the performance of US banks, thereby setting a benchmark for most worldwide organizations in assessing operational effectiveness and risks of the bank (Angela & Camelia, 2013).

The model is mainly grounded on financial factors and scales to make the rankings of banks, which allows bank managers to predict “the health situation” of their institutions. The evaluation criteria comprise capital adequacy, asset quality, management, earnings, and liquidity. Since 1996, with the desire to focus more on risk management, the sixth component has been added, being the sensitivity to market risk, which is labelled “S” and can be employed as financial soundness parameter for the bank. However, it in principle offers an analytical approach based on some criteria without intensive focus on the governance and supervision of the activities of financial institutions as do the Basel Accords.

According to Mishkin (2013), financial intermediaries are the ones that link together surplus and deficit agents, and this role becomes more global in the context of financial integration. These institutions help reduce transaction costs, capitalize economies of scale, benefit the community to large extent, and improve economic efficiency as well as living standards.

International standards for governance of financial institutions

Quite a few standards in the world have been established with regard to financial institutions management. According to Standard and Poor’s (2005), the currently commonly applied standards include Basel II developed by the Basel Committee on Banking Supervision and IFRS (International Financial Reporting Standards), advanced by the International Accounting Standards Board (IASB).

Three core principles of Basel Accords involves exchanging information on supervision at the national level, improving methods in monitoring international bank performance, and setting minimum standards for monitoring banks and minimizing potential risks (Bank for International Settlements, 2013). These currently include Basel I, Basel II, and Basel III.

Coming into existence in 1988, Basel I has a nature of an international agreement and standards of equity capital as was proposed. Also defined in the accord is the minimum capital adequacy ratio of 8%, measuring a bank’s capital in connection with its risk-weighted assets. This is one of the bases and criteria for the world-wide banking system to apply in order to ensure its safety of operations. As time goes by, with the application

plus the trend of its rapid development Basel I has revealed some shortcomings since it focuses on credit risk instead of such other ones as operational risk or market risk.

Basel II was published in 2004, offering more completion and flexibility in determining the capital adequacy ratio as a way to overcome Basel I's limitations. The accord allows for more advanced risk-management approaches, and its standards become more risk sensitive. Consisting of a total of 25 supervisory standards, it is structured according to three mutually reinforcing pillars:

The first pillar, on the ground of Basel I, lays down minimum capital requirements in relation to credit risk and operational risk.

The second pillar develops guidelines based on which banks can review their risk management process.

The third pillar attempts to demand banks' disclosure of basic information relating to capital, risk exposures that encourages the operation of market principle.

Basel III was issued in 2010 as an extension of the extant Basel II that introduces new capital and liquidity requirements that reinforce the regulations on bank risk supervision and management. The framework of Basel III, also based on the Basel II's, requires higher and more-enhanced-quality capital for financial institutions.

Basel Supervision of commercial bank performance under Basel Accords

Credit risk management: risk occurrence involves losses caused by borrowers or partners. Measuring and/or calculating risk parameters for assets considering credit risk in accordance with Basel II framework includes using either the standardized approach or the Internal Ratings Based (IRB) approach. Concerning the latter, the bank may also decide between foundation and advanced IRB approaches.

Operational risk management: According to the Basel Accord, operational risk is "the risk of direct or indirect loss resulting from inadequate or failed internal processes, people, and systems or from external events." Three options that can be considered by banks for capital adequacy to manage operational risk in increasing order of complication and sensitivity to risk comprise: (i) the basic indicator approach (BIA), (ii) the standardized approach, and (iii) the advanced measurement approach (AMA).

Market risk management: General market risk is associated with the risk of loss arising from adverse changes in market prices. Typically, market risk involves four basic types in trading book transactions, namely interest rate risk, equity price risk, foreign

exchange risk, and commodity risk. The Basel framework captures two broad methodologies of market risk assessment, including the standardized approach and internal models.

Liquidity risk management: Liquidity risk denotes the risk of loss arising from deficiencies in cash or cash equivalents, or more particularly, it may be associated with the loss derived from the inability to arrange funding sources with certain degree of cost reasonableness or to have it sold or arranged at a reasonable price to cover an obligation having been intended and/or unintended (Gup & Kolari, 2005). In light of Basel Accords, banks should maintain a proposed capital adequacy ratio of over 8%. It helps determine banks' ability to meet scheduled debt payment and various risks they have to face such as credit risk or operational risk. Well maintaining this ratio implies that banks have successfully generated a cushion against financial shocks that helps protect themselves and depositors.

Interest rate risk management: This kind of risk involves potential change in net interest income and market value of bank capital arising from interest rate variance (Koch, 1995). Concerning Basel II suggestions, to facilitate the management of interest rate risk implemented by supervisors of institutions, banks should construct sufficient and reliable data systems.

Commitments to the implementation of Basel Accords standards among countries are subject to the legal framework reforms, thus accelerating the integration process of domestic banking system.

2.2. Earlier researches on the same issue

Indeed, most governance practices among financial institutions in the world comply with the Basel Accords. Oldfield and Santomero (1997) with a synthesis of literature on 130 empirical researches demonstrated that the performance of financial institutions is strongly influenced by managerial activities in general and risk management in particular. For this reason, the governance, in the international integration trend, should be adapted to international standards, and from a macro perspective, the Government's and state bank's regulations should be carefully considered.

Standard & Poor's Ratings Services (2005) extended the research scope by taking account of business risk management among world-wide banks and other financial organizations. To an overall extent, it is believed that general assessment carried out in

these institutions should be aimed at different dimensions, such as market risk, credit risk, operational risk, business risk, reputation risk, audit, and governance.

Financial institutions at current time, as remarked by IBM (2008), are facing so many risks and challenges to act in compliance with certain standards. There has been issuance of Basel II/III, International Financial Reporting Standards (IFRS), Mortgage Industry Standards Maintenance Organization (MISMO), and Sarbanes–Oxley Act (SOX) to alleviate these risks.

Grody et al. (2011) reasoned that traditional risk accounting approaches potentially detect risks in a lagging manner, and considered a possible framework for determining risks thoroughly and promptly as well as examining one sound approach. Through the research the importance of operational risk in financial market is also confirmed.

Bernanke (2008) claimed that the design of Basel II is to enhance risk management quality by more strictly imposing regulatory capital on underlying risks faced by financial institutions and by requiring the development of internal systems for assessing credit risk and others.

Carey and Stulz (2005) suggested that there exists a need to quantify the risk measurement and management, which also provide forecasts of the actual conditions of profit distribution of financial institutions, allowing for decisions on investment portfolios or capital and design of internal control systems to ensure proper decisions to be made.

According to Gamaginta and Rokhim (2010), the occurrence of risk may lead to bankruptcy of banks. So, it is necessary to estimate bankruptcy levels reflected through the risk using the Z-score index based on data available in banking financial statements. Up to the present time the index has been commonly adopted in various studies an indicator of the risk of bankruptcy in the banking industry. The higher index implies lower risk and more stability in banking operations.

Swinburne et al. (2007) used multiple regressions with Z-score employed as a dependent variable to assess the effects of financial risks, such as credit risk, market risk, liquidity risk, and macroeconomic factors on banking stability in ten countries of the European Union and eight banks in neighboring countries over the period between 1997 and 2004. Their findings showed that rapid credit growth causes instability to the banks in the sample. Additionally, higher loan-loss provisioning is linked to more instability as it reduces banking profitability; inconsistency exists in the impact of liquidity risk on

the stability of the banks in the sample, and banks with low capitalization levels are exposed to greater risk than those with higher ones.

Demirgüç-Kunt and Detragiache (2010) investigated whether compliance of banking supervisory practices with basic Basel principles minimizes bank risk. The risk facing banks is proxied by the variable of Z-score. Using data of over 3,000 banks in 86 countries, the authors showed a positive relationship, albeit being not statistically significant, between the compliance with the principles of Basel and Z-score; specifically, a high ratio of compliance is associated with reduced risks. The research results also indicated the measurement of bank risks using accounting data may cause difficulty in making cross-country comparisons. However, certain emphasis is put on strict adherence to the Basel standards in banking business.

Jordan et al. (2010) predicted the possibility of bankruptcy among 225 US banks between 2007 and 2010, using multiple regression models with Z-score as a dependent variable and the data available from their financial statements. His results showed that leverage ratio, measured by tier 1 capital as a proportion to total assets, has the adverse relationship with risk, implying that the higher the leverage ratio, the lower the risk of bankruptcy. The ratio of non-interest income to interest income of the previous year was found to be positively related to bank risk, which means that income diversification in case of reduced interest income may increase the bankruptcy risk due to failures to maintain market share and attract loyal customers. Also, the author pointed out that investors, lenders, and managers may refer to Z-scores in determining the risk of bankruptcy.

Also employing the multiple regression approach and the same dependent variable of Z-score, Nguyen (2013) pinpointed the impact of specific indicators on bank risk with a sample of 36 Vietnamese banks from 2006 to 2011. Instead of using total earning assets for NIM (net interest income/total earning assets), the author opted for average total assets to generate the variable NIR in order to improve previous studies' approaches. His results indicated that the ratio of total loans to total short-term deposits is negatively related to risk. Meanwhile, provision for credit losses as a ratio to net interest income has a positive relationship with risk. In addition, increase in equity was suggested to be a prerequisite for protecting banks against the risk of bankruptcy besides other policy solutions to improving risk management in the banking system.

Munteanu (2012) adopted multiple regressions to identify factors affecting liquidity risk of 27 banks in Romania during the 2002–2010 period. The independent variables, divided into two groups, include bank-specific and macroeconomic variables. Particularly, tier 1 capital ratio calculated using Basel principles is employed as a proxy for bank capital, whereas Z-score index represents the stability of bank performance. The study results indicated that Z-score has real effects on the liquidity of banks over the crisis period.

Z-score, similarly, was utilized as a variable to proxy for bank stability in another study by Laura Chiaramonte et al. (2014), conducted on a panel of European banks in the period of 2001–2011. Specifically, the authors compare the application of Z-score with that of CAMELS variables to illustrate which has a real impact on the forecasts of bankruptcy. By using both Probit and Log-Log techniques, Z-score was confirmed to be more appropriately employed in predicting bank failures over the crisis years (2008–2011). Finally, the authors detected the more effective use of Z-score index in studying commercial bank performance.

Boyd and Graham (1986) applied the Z-score index to the evaluation of bankruptcy among bank holding companies (BHCs). They also constructed the relationship between bank risk and equity, suggesting that impoverishment risk is dependent on these two factors. The Z-score hints that reduction in revenue will result in deficit in capital, thereby causing bankruptcy to the bank.

Accordingly, most existing studies use Z-score as an indicator for assessing bank risk; the higher the risk, the more likelihood of bankruptcy recorded among commercial banks.

3. Research data and methodology

In synthesizing empirical results attained from previous studies on governance of banking institutions in accordance with Basel principles, we are aware that compliance with these principles would raise the levels of security in bank performance and risks, in addition, would be controlled within prescribed limits. To shed light to this reasoning for the case of Vietnam's commercial banking system, we employ multiple regression approach to evaluate the impact of risks on the levels of capital adequacy as well as the possibility of bankruptcy. The data are collected from audited financial statements of 30 commercial banks over the period of 2005–2013 besides earlier methodological

approaches (Swinburne et al., 2007; Jordan et al., 2010; Demirgüç-Kunt & Detragiach, 2010; Nguyen, 2013).

The relevant equations can be computed as follows:

$$Z_{it} = \beta_0 + \beta_i X_{it} + e_{it} \quad (1)$$

where the dependent variable Z_{it} denotes Z-score index of bank i in year t , which is used to quantify bank stability in accordance with Cihak and Hesse (2008) (the higher the score, the lower the risk), X_{it} is a vector of the independent variable for bank i in year t , and e_{it} denotes error terms.

$$Z_{it} = [E_i(ROAA_{it}) + Ebp_{it}/A_{bqit}] / \sigma_i(ROAA_{it}) \quad (2)$$

where:

$ROAA_{it}$: return on average assets of bank i in year t ,

$E_i(ROAA_{it})$: average ROAA of bank i

$\sigma_i(ROAA_{it})$: standard deviation of ROAA of bank i

Ebp_{it}/A_{bqit} : ratio of average equity to average total assets of bank i in year t ,

Due to no official information provided by IMF and WB on application of Basel Core Principles to Vietnamese commercial banks, we do not include the variable X_i to our studied models.

Credit risk—proxied by:

LLR_{it} : *Loan loss reserve ratio*

LLR_{it} is measured by loan loss reserve/total loans and lease of bank i in year t . The higher the ratio, the higher the credit risk, thus causing reduced asset quality and increased nonperforming loans, which badly affect earnings. According to Whalen and Thomson (1988), the loan loss reserve/total loans and lease ratio is positively related to risk, whereas the loan loss reserve of previous year, indicated by Halling (2006), has a negative relation with bank risk. Banks under favorable (adverse) financial conditions actively increase (reduce) loan-loss reserves.

H_1 : LLR_{it} is negatively related to *Z-score* and positively related to bankruptcy likelihood.

LLP_{it} : *Loan loss provision ratio*

LLP_{it} , a ratio of provision for loan losses to net interest income, represents how banks deal with nonperforming loans that affect their revenues. When the income cannot offset

the expenses, it is impossible for banks to achieve profitability objectives. Whalen (1988) detected a positive nexus between the ratio of loan loss provision to average total earning assets and risk, which is not statistically significant though, while Halling (2006) expected the ratio of risk expenses to income from banking activities to be positively related to risk, but it was suggested to be not significant due to changes during regression stages. A high *LLP* ratio is associated with high risk. An increase in nonperforming loans negatively influences bank profits, entailing higher risk levels.

H₂: *LLP_{it}* is negatively related to *Z-score* and positively related to bankruptcy likelihood.

Liquidity risk—proxied by:

LTD_{it}: *Loan-to-deposit ratio*

LTD_{it}, a ratio of total loans to total short-term deposits of bank *i* in year *t*, is used to measure liquidity supply and demand of the bank. Its increase will lead to that in liquidity risk due to imbalances between the liquidity supply and demand. In examining the case of Japanese and Indonesian commercial banks, Montgomery et al. (2004) documented that a positive relation exists between the loan-to-deposit ratio and risk of bankruptcy, arguing that during crisis periods banks often focus on credit growth in search for more earnings and tend to aim at riskier borrowers with higher lending rates. Meanwhile, as for PWC (2006, 2012), the loan-to-deposit ratio helps determine liquidity as well as the tendency and status of bank liquidity during its performance.

H₃: *LTD_{it}* is negatively related to *Z-score* and positively related to bankruptcy likelihood.

LAD_{it}: *Liquid-asset-to-deposit ratio*

LAD_{it}, calculated by liquid assets minus short-term borrowing as a ratio to total deposits of bank *i* in year *t*. Liquid assets can be viewed as liquidity reserves employed by banks to deal with mass cash withdrawals for a certain cause. The higher ratio is synonymous with sound bank liquidity management, which minimizes the liquidity risk. According to Montgomery (2004), although *LAD* has a positively association with risk of bankruptcy, this link is of no statistical significance. PWC (2006, 2012) highlighted the importance of *LAD* in assessing liquidity risk in general and bank liquidity in particular.

H4: LAD_{it} is positively related to *Z-score* and negatively related to bankruptcy likelihood.

Interest rate risk—proxied by:

NIR_{it} : *Net interest ratio*

NIR_{it} , a ratio of net interest income to average total assets of bank i in year t , is used to perform the impact of interest rate risk on risk of bankruptcy since the interest income is one main source of revenue. Its increase results from increased net interest income or decreased total assets (due to reduction in investment or lending activities with regard to risky accounts). A reduction in the ratio implies that more risks are facing bank performance owing to a fall in net interest income and reduced investments in risky accounts. While Halling (2006) found a positive relationship between this ratio and bank risk, Nguyen (2003) explored NIR in its negative association with *Z-score*.

H5: NIR_{it} is positively related to *Z-score* and negatively related to bankruptcy likelihood.

Others

LEV_{it} : *Leverage ratio*

LEV_{it} is calculated by equity capital divided by total liabilities of bank i in year t . In the event of banks requesting more deposits (i.e. higher liquidity risk and interest rate risk), less equity is associated with inadequate provision that causing them to suffer difficulties when unexpected incidents occur. Montgomery et al. (2004) suggested that the leverage ratio positive relates to bank risk; however, this result is not statistically significant. In Jordan's (2010) study, the leverage ratio, measured by the ratio of tier 1 capital to total assets, has an adverse relationship with bank risk, meaning that the higher the leverage, the lower the risk. Abundant equity financing will effectively help banks withstand the risks facing their operations.

H6: LEV_{it} is positively related to *Z-score* and negatively related to bankruptcy likelihood.

CTI_{it} : *Commission-to-income ratio*

CTI_{it} is measured by the ratio of fees and commission expenses to net income. Whallen (1988) showed that there is a positive link between CTI and bank risk. A rise in this ratio (i.e. increase in expenses) reduces effectiveness of banking activities, thereby causing increased bank risk. Reduction in the ratio may be subject to either

reduced expenses or increased net interest income (large interest rate difference raises profitability). Halling (2006) found that the ratio of operational costs to total assets and that of operational costs to expected income positively relate to bank risk. Likewise, Cihak and Hesse (2008) detected a positive link between the ratio of operational expenses to total income and bank volatility.

H_7 : CTI_{it} is negatively related to Z -score and positively related to bankruptcy likelihood.

Table 1

Research hypotheses

Hypothesis	Independent variable	Proxy for	Expected correlation with Z-score	Expected correlation with risk
H_1	LLR	Credit risk	-	+
H_2	LLP	Credit risk	-	+
H_3	LTD	Liquidity risk	-	+
H_4	LAD	Liquidity risk	+	-
H_5	NIR	Interest rate risk	+	-
H_6	LEV	Others	+	-
H_7	CTI	Others	-	+

4. Results and discussion

4.1. The current state of Vietnam's financial institutions

Regarding the number and size of Vietnam's commercial banks:

According to SBV statistics of 2013, Vietnam's commercial banking system comprises five state commercial banks, 35 joint-stock commercial banks, 50 foreign bank branches, four joint-venture banks, and five wholly foreign-owned banks. These banks' operation networks spread across various provinces/cities over the country.

Regarding bank capital raising and lending:

By the end of 2013 the growth rates of capital raising and lending reached 22.96% and 12.52% respectively. The primary cause was economic slowdown, leading to hardship in product selling and thus reduction in credit demand. Additionally, a boom in nonperforming loans during this period caused banks' unwillingness to offer capital lending services (SBV, 2014).

Regarding nonperforming loans among Vietnam's commercial banks between 2006 and 2013:

Statistics provided by KPMG (2013) with regard to the national commercial banking system suggested that the levels of nonperforming loans tend to increase in recent years. Specifically, the period of 2006–2013 saw an increase in these from 2% in 2007 to 4.08% in 2012. Establishment of Vietnam Asset Management Company (VAMC) at the end of July 2013 as well as certain improvement in macroeconomic state has been subject to a sharp reduction in the whole system's nonperforming loans as a share of total loans to 3.61% in end-2013 period (SBV, 2014).

Regarding performance of non-banking institutions:

Currently the existing types of non-banking institutions in Vietnam include financial, security, insurance, and fund management enterprises. Compared to those in foreign countries, Vietnam's non-banking institutions have been only set up since the 1990s; thus their number and size remain limited.

In Vietnam there are also approximately 17 financial firms characterized into one of the following three categories: (i) single-member limited liability companies; (ii) two-member limited liability companies; and (iii) joint-stock financial companies. The charter capital of these enterprises are currently prescribed at VND500 billion.

Additionally, the country witnesses the operations of 29 non-life insurance companies, 16 life-insurance companies, two reinsurance companies, and 12 insurance broking companies. Total assets and premium income of these firms continue to rise in the 2006–2012 period.

The number of securities companies has been constantly increasing since these came into existence. According to data from the State Securities Commission of Vietnam (SSCV), the number of securities companies, counting to end-2013, is around 94; the ratio of market capitalization reached VND949,000 billion, equivalent to 31% of GDP. This implies that the securities firms have effectively supported listed companies in accessing capital sources from investors with low costs and sustainability.

Statistics from SSCV also show that by the end of June 2015 the fund management industry recorded establishment of 50 companies with total charter capital of VND3,428 billion. Of these 41 are now in operation, seven suspended, and two under special control. Levels of charter capital of these fund management enterprises also differ. As of 2013 only six revealed the charter capital of greater than or equal to VND100 billion, whereas this figure for the others were less than VND100 billion.

4.2. Governance of financial institutions in Vietnam

Monitoring agencies and the state bank little by little adopt international standards on safety in banking operations by issuing specific legal documents and supervising the activities of governing the commercial banking system under the Basel Accords.

Given commercial banking system operations, more effort should be made in completion of the legal framework for monetary policy and banking activities as well as improvement in governance capacity. In these days most banks achieve the defined capital adequacy ratio of above 9% (according to financial statements of commercial banks), especially risk management capacity of banks toward international standards and practices. Accordingly, the gradual application of Basel II principles has received yet more special attention, notably after financial crises and global economic downturn in recent years. In addition to compliance with the mandatory regulations as were prescribed by the central bank, these banks need to shift from passive to active risk management mechanisms, and in doing so, they have developed: (i) internal regulations on and/or procedures for implementing activities and transactions that ensure security and strict compliance with international standards; (ii) specialized risk management systems for not only credit/market risk but also operational risk; (iii) systems of internal credit ratings, debt classification, and loan loss provision from both quantitative and qualitative perspectives in accordance with Basel standards. (iv) internal supervision system uniformly for the entire commercial banking system to implement risk management practices; and (v) core banking systems in support of bank performance monitoring.

Non-banking institutions have shown certain innovation in their management systems in compliance with legal regulations as have commercial banks, and adopted similar strategies for internally governing the organizations, classifying debts, and implementing loan loss provision besides the growing concern over risk control.

4.3. *Z-score model for assessment of commercial bank risk*

As a general trend, effective governance practices enables banks to conveniently detect risks and control them. Conversely, risk management would exhibit banks' governance capacity.

The data employed in this research are collected from audited financial statements of 30 Vietnamese commercial banks for the 2005–2013 period.

Table 2

Research sample

Type	Banking abbreviations
State commercial banks	Agribank, Vietinbank, BIDV, MHB, VCB
Joint-stock commercial banks	ACB, Banviet, DongA, HDB, Maritime, MB, NAB, STB, SGB, Sea, SHB, TCB, VIB, VPB, MDB, Navi, Ocean, EIB, Lienviet, KLB, ABB, OCB, PGB, SCB, VietA

Source: financial statements of Vietnam's commercial banks

Through Z-score index of 30 commercial banks in Vietnam, it is shown that large-sized banks with large equity capital and total assets or those that are listed and conform to Basel principles, such as Vietinbank, BIDV, MHB, VCB, TCB, and VIB, witness fluctuations in Z-score, which has a tendency to rise in recent years. Volatility in the index is also revealed by small-sized banks, namely DongA, Banviet, ABB, Lienviet, and Navi, but its levels are low. Particularly, NAB, despite being a small-size bank, has had Z-scores over the past years.

Descriptive statistics and analysis of correlation coefficients

Table 3 provides a preliminary overview of the research data, which are collected from banks' financial statements. Due to unavailable financial statements provided by some banks for a few years, the data obtained can be characterized as unbalanced panel. Also, this indicates that there is divergence between the observations in the sample, which is expressed through the mean value, the maximum value, the minimum value, and the standard deviation. Importantly, *Z-score* has the maximum value of 153, and its minimum and mean values are 5 and 24.10 respectively; standard deviation from the mean is 14.75, showing a rather large difference in stability of the banks in the sample over the years. In addition, the maximum value of *LTD* reaches 707.16, whereas its

minimum value is 0.40, implying a great volatility in the *LTD* ratio. Also, its standard deviation is 56.86, showing that distributions of this ratio are very different among the banks over the years.

Table 3

Statistical description of the dataset

Variable	Obs.	Mean	Std. dev.	Min	Max
Z-score	259	24.10039	14.75424	5	153
LLR	249	0.0113903	0.0073099	-0.00243	0.038853
LLP	244	0.1659209	0.1664235	-0.30109	1.043645
LEV	253	0.188914	0.2833023	0.001733	2.55407
NIR	258	0.0322068	0.0140287	0.004451	0.08938
CTI	248	0.59949	0.3086987	0.176293	3.615257
LTD	253	11.26203	56.86141	0.406152	707.1669
LAD	253	0.0559653	0.1813232	-0.60642	0.881544

Source: authors' compilation from financial statements of commercial banks using STATA 12

Table 4 presents correlation coefficient matrix of the studied variables. The results indicate that correlation coefficients are rather small, implying little possibility of multicollinearity among the variables.

Table 4

Correlation coefficient matrix of the variables

	LLR	LLP	LEV	NIR	CTI	LTD	LAD
LLR	1						
LLP	0.4979	1					
LEV	-0.2202	-0.2253	1				
NIR	-0.0533	-0.124	0.4205	1			
CTI	0.0109	0.1177	-0.0791	-0.465	1		
LTD	-0.0397	0.0307	0.5165	0.1141	-0.0569	1	
LAD	0.1787	0.0962	0.0912	-0.0778	-0.0966	0.0768	1

Source: authors' compilation from financial statements of commercial banks using STATA 12

We re-examine the multicollinearity by using variance inflation factor (VIF) (Table 5). The results suggest that the mean of VIF is 1.49 and that VIF values of independent

variables range between 1.11 and 1.95. Hence, we can conclude no existence of multicollinearity among the variables in this study.

Table 5

VIF results

Variable	VIF	1/VIF
LEV	1.95	0.512979
NIR	1.7	0.588848
LTD	1.45	0.689047
LLP	1.41	0.70795
LLR	1.4	0.712507
CTI	1.38	0.723203
LAD	1.11	0.898741
Mean VIF	1.49	

Source: authors' compilation from financial statements of commercial banks using STATA 12

We use White-test to test for heteroskedasticity. Its results suggest that p-value is less than 0.05, implying that there exists a heteroskedasticity problem.

Initially, we consider using common panel data regression approach with Pooled OLS technique to perform the regression and test for a few hypotheses from the OLS model. Then, we conduct Pooled OLS, FEM, and REM estimations to opt for the most suitable model. Our research continues with the use of Chow-test/F-test to decide between Pooled OLS and Fixed Effect models. Since $p\text{-value} < 0.05$, we choose FEM for the next step. Next, Hausman test is employed to decide between FEM and REM, and $p\text{-value} > 0.05$ allows for the selection of REM. To determine which estimation is more suitable of Pooled OLS and REM, we proceed with Breusch-Pagan test; $p\text{-value} < 0.05$ implies that using REM is more appropriate. Accordingly, results of the three different tests are contradictory. There is also an occurrence of heteroskedasticity for residuals of the models; therefore, we prioritize the use of FEM and GLS estimators to overcome the problem (Gujarati & Porter, 2009). The final results are presented for FGLS regression (Table 6).

Table 6

Results of different regression techniques

Variable	Pooled OLS	FEM	REM	FGLS
	Z-score	Z-score	Z-score	Z-score
LLR	-18.32	-150.4*	-134.8	-94.53***
	(-0.19)	(-2.12)	(-1.93)	(-4.49)
LLP	4.767	2.787	3.201	-0.18
	-1.07	-0.78	(0.92)	(-0.15)
LEV	51.12***	49.12***	49.18***	54.35***
	-15.69	-17.92	(18.57)	-25.69
NIR	-227.8***	-24.71	-57.04	30.13*
	(-4.24)	(-0.49)	(-1.18)	-1.86
CTI	-3.134	-0.866	-1.227	2.117***
	(-1.44)	(-0.55)	(-0.79)	-3.36
LTD	0.00552	-0.00106	-0.0000919	0.000148
	-0.46	(-0.13)	(-0.01)	-0.15
LAD	-1.943	1.771	1.698	0.0163
	(-0.51)	-0.61	(0.59)	-0.01
_cons	23.51***	17.69***	18.55***	13.78***
	-8.7	-8.07	(7.34)	-12.67
Chow-test (p-value)		0.0000		
Hausman-test (p-value)			0.3587	
Breusch-Pagan test (p-value)				0.0000
N	234	234	234	234

Variable	Pooled OLS	FEM	REM	FGLS
	Z-score	Z-score	Z-score	Z-score
R ²	0.645		0.734	

Note: t-statistics in parentheses

* p<0.1, ** p<0.05, *** p<0.01

Source: authors' compilation from financial statements of commercial banks using STATA 12

Regression results

• Credit risk

– *LLR: Loan loss reserve ratio*

LLR negatively relates to *Z-score*, positively relates to bank risk, and is statistically significant at 1% level. This result is exactly as expected and consistent with that of Whalen (1988). Increasing nonperforming loans leads to a rise in credit loss provision and thus in the loan loss reserve ratio. Thus, the higher the credit risk, the higher the *LLR*; asset quality will then reduce, whereas bank risk will be more serious. A low *LLR* shows good practices of credit risk management; banks suffer less nonperforming loans, which would lead to increased profits.

– *LLP: Loan loss provision ratio*

LLP indicates both credit quality and nonperforming loans badly affecting bank income. An increase in nonperforming loans results in greater loan loss provision expenses, thereby causing a higher *LLP* ratio and diminishing net interest income. The regression results illustrate that *LLP* negatively relates to *Z-score* and positively relates to bank risk. Therefore, greater loan loss provision expenses are associated with lower credit quality and larger nonperforming loans. Costs of handling nonperforming loans also give rise to *LLP*, and when bank revenue cannot offset costs of risk, its profits will plummet. This result lives up to our expectation and is compatible with Whalen's (1988) findings. Yet, the impact of *LLP* in this study is found not to be significant.

• Liquidity risk

– *LTD: Loan-to-deposit ratio*

LTD positively relates to *Z-score* and negatively relates to bank risk; however, this result is not statistically significant. In terms of this impact, it falls short of our

expectations. A negative relation between *LTD* and risk suggests that the higher the loan-to-deposit ratio, the lower the risk.

– *LAD: Liquid-asset-to-deposit ratio*

LAD positively relates to *Z-score* and negatively relates to bank risk. This result, similarly, is not statistically significant but is as expected in terms of signs. In fact, *LAD* serves to evaluate bank liquidity; the higher ratio implies that the bank liquidity is at good levels, allowing it to willingly meet current customer requirements.

• Interest rate risk

NIR: Net interest ratio

NIR positively relates to *Z-score*, negatively relates to bank risk, and is statistically significant at 10% level. Thus, given the impact, we see that higher net interest income facilitates risk avoidance. The higher income may result from arrangement of interest-sensitive assets and capital flows. Also, when the number of loans and risky investments reduce, bank's total assets and *NIR* will rise.

• Others

– *LEV: Leverage ratio*

As earlier defined, the variable *LEV* denotes equity capital as a ratio to total liabilities. It not only serves to exhibit bank's financial capacity, but provides a sound basis for determination of its adequacy ratio. In fact, the equity capital demonstrates the ability of commercial banks to raise capital; the larger amount of equity capital, the greater the ability. Its regression result shows that *LEV* is positively associated with both *Z-score* and bank risk, and is statistically significant at 1% level. This result is broadly in line with our expectations and Logan's (2001) conclusion. It is accordingly suggested that if increase in capital mobilization surpasses increased equity capital, it would be harmful to the health of the banking institution. If the equity capital rises, together with the mounting equity-to-liability ratio, it should help limit the risk of capital raising and lending as performed by commercial banks.

– *CTI: Commission-to-income ratio*

CTI positively relates to *Z-score*, negatively relates to bank risk, and is statistically significant at 1% level. This results is completely beyond expectations and inconsistent with that of Whalen's (1988) study. An increase in operational expenses (mostly on

wages and pensions), as suggested, would foster the stability in bank performance and risk reduction.

4.4. Shortcomings in commercial bank governance

Concerning the macroeconomic situation, recent macroeconomic instability and the global financial crisis have adverse impact on the activities of financial institutions in general and commercial banks in particular. The unsavory incidents caused difficulty and hindrance to the bank performance, entailing increased risk and high possibility of bankruptcy.

Concerning the legal system, there exist certain limitations and little updated regulations in harmony with Basel Accords. Additionally, as for the ones on adequacy ratios for credit institutions or minimum charter capital, these regulations should be aimed at adjustments to their operations along with tangible orientations to all activities as well as spending practices of these.

Concerning state bank supervision, inspection and supervision reveal problems; information system offers little predictability, guidelines on applying the Basel standards are inadequately issued, thereby causing confusions in the implementation.

Concerning commercial bank governance, although many efforts have been made, banks' management capacity remains restricted; many have not explicitly formulated strategic objectives of management. Moreover, sketchy risk management and unsystematic inspection and supervision are evident. Risk of professional ethics has particularly led to far-reaching consequences.

5. Policy recommendations

5.1. Orientations to governance of Vietnam's financial institutions until 2020

According to Clause 2, Article 1 of the scheme on development of the banking sector of Vietnam until 2010 and orientations toward 2020 (Vietnamese Government, 2006), improving the credit institution system that operates safely and efficiently should be based on technological advances and proficient managerial levels by adopting the international standards and codes of practices on commercial banking activities.

The scheme on restructuring of credit institution system between 2011 and 2015 (Vietnam Government, 2012) also refers to: (i) developing risk management systems in line with the principles and standards of Basel Committee with special focus on systems

of credit, liquidity, market, and operational risk management; (ii) improving the system of internal credit ratings; (iii) adopting loan classification and loan loss provisioning in compliance with international practices and degrees of credit risk; and (iv) enhancing credit institutions' capacity for credit assessment, and/or appraisal and credit risk management and monitoring.

5.2. Recommendations to the State Bank

First, issue the legal documents on guiding the application of Basel II/III principles regarding credit institution governance.

Second, improve efficiency in managing and inspecting banking institutions; according to Basel Committee, the state bank plays a major role in stable operations of the whole banking system, and this can be reinforced by:

(i) Improving the organizational structure of banking supervision with independence of executive and professional activities; applying basic principles of effective supervision of banking activities proposed by Basel Committee and adhering to the principles of inspection;

(ii) Developing the number and competence of inspecting/supervisory staff with good ethic, who are well equipped with substantial legal knowledge;

(iii) Devising commercial bank risk monitoring systems capable of issuing prompt alerts for credit institutions; and

(iv) Designing detailed schedules for applying Basel II/III Accords up to 2020 and providing commercial banks with precise guidance on early issuance of standards required for the systems of internal auditing management, asset liability management, and credit/market/operational risk management; these are minimal conditions to be met by the commercial banks and observed by the state bank in its inspecting and monitoring their risk management systems.

5.3. Recommendations to financial institutions in Vietnam

Construct and improve the risk management system in compliance with Basel standards; commercial banks should focus on building database/information technology systems and risk management processes in conjunction with the development of information technology infrastructure that ensures the safety and security of information to meet the requirements of international management practices. Proper approaches shall

be adopted under consideration of favorable conditions, in compliance with national legislation, and with consent of banking supervisory authorities.

Complete the organizational structure of commercial banks toward increasing professionalism in addition to establishing risk management committee, personnel committee, and monitoring system that should wholly determine bank risks and offer appropriate solutions (risk management procedures must be applicable to every single kind of risks and for the entire risk portfolio).

Improve the banking inspection and supervision system toward higher quality of financial analysis and develop the early warning system for potential risks; at the same time reorganize the structure of risk management toward ascribing responsibility of specialized divisions and separated functions of risk management departments and sales departments.

Regarding non-banking institutions, gradually establish risk management processes, conforming to international standards and Vietnam's legal system and ensuring safety standards of business activities; these institutions shall apply similar approaches to risk management as adopted by commercial banks, but they should well adapt to non-banking characteristics.

5.4. Further recommendations based on the research findings

The research results indicate that one of the strategies for reducing bank risk levels is to increase equity capital in the near future to satisfy the need for banking operations and competition as well as facilitating capital raising from and lending to customers. Furthermore, increasing equity capital contributes to enhance financial capacity and risk hedging ability of not only a single banking institution but also the whole banking sector.

Commercial banks should strengthen liquidity management in accordance with international practices through controls over and/or exploitations of supply and demand of capital sources, which could meet their business requirements.

In light of the analyses, a positive and significant relationship is found to exist between loan loss reserve (*LLR*) ratio and bank risk. Thus, solving the problem of nonperforming loans inevitably influences bank revenue. Commercial banks, accordingly, should take measure to establish stricter controls over credit procedures in order to minimize the risks.

6. Conclusion

Governance of financial institutions by risk management approach in accordance with international standards is a general trend for most countries in the world. Our study addressed this issue, adhering to Basel principles for the case of commercial banks in Vietnam. Using multiple regression technique and adopting Z-score as a dependent variable, we have performed an analysis of risk factors with their effects on bank performance as well as of the current state of risk management among the institutions. On the ground of limitations on risk management practices, we have proposed recommendations as to development of Vietnam's commercial banking system until 2020 conforming to Basel II/III standards■

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