

INFORMATION DISCLOSURE AND BANK RISK-TAKING: EMPIRICAL EVIDENCE FROM VIETNAM

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ABSTRACT

This paper explores the impact of information disclosure and transparency on Vietnamese banks' risk-taking by using the Generalized Method of Moments (GMM) approach with panel data of 28 Vietnamese commercial banks from 2007 to 2019. A notable new contribution of the study is the authors' construction of a disclosure index for Vietnamese banks and their evaluation of the impact of bank transparency on bank risk-taking through this index. Research results show that the more transparent and complete the information a Vietnamese commercial bank discloses, the safer the bank is. Furthermore, the findings indicate that implementing Basel II substantially improves the influence of transparency and information disclosure on commercial banks' Z-scores.

Keywords: information disclosure, transparency, bank, risk-taking, Vietnam.

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INTRODUCTION

Disclosure is a top concern for investors because it is an important factor influencing their investment activities. In addition, transparency and disclosure are legal obligations of organizations to enhance their value. In the financial system, disclosure is more important to banks compared to other non-financial institutions. Since the bank's tangible asset-to-total assets ratio is low, investors typically evaluate a bank's performance and asset quality based on information disclosure. However, commercial banks are often opaque (Iren et al., 2014). The lack of transparency in the reporting of the banking system leads to asymmetric information problems, which pose risks and

make investors suspicious of the banks' reported losses (Freixas & Laux, 2012). Transparent information reflects many important and reliable information of the bank, including financial position, performance, risk, and investment opportunities for investors. (Bushman & Smith, 2003). In addition, transparent information regarding a bank's returns and risks indicates that banks have the appropriate discipline to optimize their capital (Jones et al., 2012).

Transparency and disclosure of information in the banking industry not only aid in financial market development but also play a critical part in the Vietnamese market's international integration process. Since Vietnam's accession to the World Trade Organization (WTO) in 2006, transparency and availability of information

about the Vietnamese financial system have improved considerably. However, some Vietnamese commercial banks continue to violate information transparency since the government's punishments are insufficient to dissuade them, resulting in various limits on Vietnamese commercial banks' information disclosure. To combat these bad behaviors, the State Bank of Vietnam has mandated commercial banks to comply with Basel II since 2014, strengthening information disclosure obligations.

Starting from the above issues, this paper contributes to the banking research literature in several ways. Firstly, this paper pioneered in building a set of indexes to measure transparency and information disclosure of Vietnamese commercial banks. Secondly, the research provides additional evidence about the impacts of transparency and information disclosure and information completeness on banks' risk-taking in Vietnam. While other studies in Vietnam only determined the impact of transparency on bank performance in general, this paper will focus on the impact before and after the adoption of Basel II. This aids in determining the efficiency of Basel II implementation in raising Vietnamese commercial banks' accountability for information disclosure. This study is organized into five sections. Section 2 includes a review of the literature. Section 3 highlights the methodology adopted for the study. Further, section 4 summarizes the primary findings and results. At last, conclusions and recommendations are discussed in section 5.

LITERATURE REVIEW

Transparency and information disclosure index of commercial bank

Basel II Pillar 3 requires banks to provide information in accordance with five principles: clear, comprehensive, relevant to users, consistent, and comparable. As a result, banks must disclose more information, providing the market with a more comprehensive picture of the bank's performance and risks. According to certain research, the bank with transparent information will receive greater compassion from regulators (Kane, 2004; Thakor, 2004). Furthermore, banks need to increase information openness in order to lower the economy's risk of a catastrophe (Tadesse, 2005). When

investigating the link between long-term stock price volatility of banks and transparency level in annual reports, Baumann & Nier (2004) found that transparent information of banks allows investors to obtain more advantages. Moreover, the more transparent the bank's disclosure of information, the more profit the bank has (Hirtle, 2011) and the more incentive to manage risks (Nier & Baumann, 2006).

Botosan (1997) argued that applying a single disclosure measurement method to all business sectors is impossible because each sector has a different standard. The banking industry also has a different measure of transparency than other businesses because of its high-risk nature. The index of transparency and disclosure of information in the banking industry was first developed by Baumann & Nier (2003) and built from three secondary indexes. The first two are indirect measures of the amount of information available to investors, while the third is a direct measure of the amount of information available to the market. Specifically, the first index assumes that banks listed on the NYSE, NASDAQ or AMEX must align with disclosure rules, while the second one is based on bank rating agencies such as Standard & Poor, Moody's, or Fitch. The third index is built on 17 categories of information from banks' annual financial statements, with each category relating to the bank's risk factors. Baumann & Nier (2003) also pointed out that integrating information updates, opportunities, and accessibility can enhance a bank's disclosure measure. On this basis, Douissa (2011) created a new composite index that combines four dimensions of information, calculated by using four intermediate indexes: (i) Index of information completeness; (ii) Index of information opportunity; (iii) Index of information credibility; and (iv) Index of information accessibility. Based on the analytical framework of Baumann & Nier (2003), Huang (2006) proposed the disclosure index including 2 indexes: core set and encouraging set. The encouraged set encourages banks to provide extensive information on credit risk, market discipline, and market risk. A similar checkbox approach will measure the level of detail of the information the bank has announced to create a composite index.

In general, the introduction of these indicators has aided in assessing commercial banks'

information disclosure and transparency and provided a variable to analyze the impacts on commercial bank performance.

The relationship between information disclosure and bank risk-taking

Flannery (2001) suggested that there is a theory that could establish a disciplining mechanism of transparency on banks' risk-taking by limiting the regulatory forbearance of captured regulators or market monitoring and pricing. Meanwhile, Cheynel (2012) explained that enterprises that voluntarily disclose their information have lower capital costs than non-disclosed enterprises based on the theory of voluntary disclosure and the cost of capital. The normal operating situation is assessed by scholars in two aspects: (i) operating performance; and (ii) operating safety. In general, when assessing these impacts, studies are often based on a self-built index as a measure of the transparency and disclosure of the bank's information.

The relationship between information disclosure and bank risk-taking is still under debate in the literature. On the one hand, some studies showed that regulations forcing the disclosure of accurate information could increase the stability of the bank (Barth et al., 2001; Demirgüç-Kunt et al., 2008; Laeven & Levine, 2009; Hirtle, 2011). Baumann & Nier (2004) studied comprehensively the impact of information disclosure on the operational aspects of banks. The results show that information disclosure reduces stock volatility, increases market value, and the usefulness of accounting information. Linsley & Shrivies (2005) pointed out that perfect disclosure could not be achieved, however, if bankers are encouraged to do so, it would better govern the bank and support the disciplinary mechanism of the market. Hirtle (2011) examined the relationship between the amount of information disclosed by banks and subsequent risk. The study's findings revealed that greater disclosure is associated with lower risks and higher returns. Derived from recent studies on disclosure and bank risk assessment (Chen et al., 2015; Hanley, 2016; Ertan et al., 2017), Wang et al. (2018) proposed a risk information disclosure index and link this index to bank soundness to measure the adequacy of disclosure related to banking risk in China. The research results showed that there is

a positive association between the disclosure index and the robustness of the bank. Wang et al. (2018) also decomposed the risk information disclosure index into its components and found that components related to risk-offering profitability are the main drivers of banks' risky behavior.

On the other hand, some studies suggest that banks disclosing more information might have a lower Z-score or more risk-taking. For instance, the higher the disclosure, the higher the risk tolerance of banks because some banks that disclose more information are subject to market discipline but refuse to limit or control their subsequent risk-taking, leading to a riskier state in the Ghana case (Kuranchie-Pong et al., 2016). Putu et al. (2012) observed in another example that there is a negative correlation between voluntary disclosure and profits management at banks listed on the Indonesian Stock Exchange. This shows that if the bank voluntarily discloses further information, its profit margins will be lowered.

The evidence on the relationship between information transparency and disclosure and banks' risk-taking is diverse and provides different results. However, there has been little research in this area in Vietnam and there has not been any research to build a set of indexes to measure banks' information transparency and disclosure of Vietnamese commercial banks. In addition, there are no studies assessing the impact of the Basel II application on Vietnamese commercial banks' information transparency and disclosure. Thus, this paper is an attempt to fill these identified gaps.

Analytical framework

This paper's analytical methodology is based on the literature of Baumann & Nier (2003) and Nelson (2001), with a modification in Douissa (2010) that simplified the transparency and information disclosure index by employing only the quantity of released information. Based on the research of Douissa (2010), this study will develop a transparency and information disclosure index (TRANS), with four intermediate indexes representing four dimensions of information: (i) index of information completeness; (ii) index of information opportunity; (iii) index of information credibility; and (iv) index of information accessibility. Following Wang et al. (2018)

approach in analyzing bank disclosure effects, the information completeness (DISC) variable will stand out as an indicator in this research besides the TRANS variable. This paper also examines the impact of size and capital adequacy ratio (CAR) on banks' risk-taking. Size is always a factor to be considered affecting different aspects of banking operations, while Konishi and Yasuda (2004) found that the implementation of the capital adequacy requirement reduced risk-taking at commercial banks.

According to Wang et al. (2018), the Z-score is used as a proxy to assess the financial stability of a commercial bank, which has been broadly adopted in earlier research by Demirgüç-Kunt et al. (2008), which investigated the relationship between bank size and bank stability; Fiordelisi & Mare (2014), which examined the influence between competition and bank effectiveness; and also in other studies (Laeven & Levine, 2009; Doumpos et al., 2015; Fernández et al., 2016). Inherited from those studies, this study will employ the Z-score as an indicator to assess commercial banks' risk-taking.

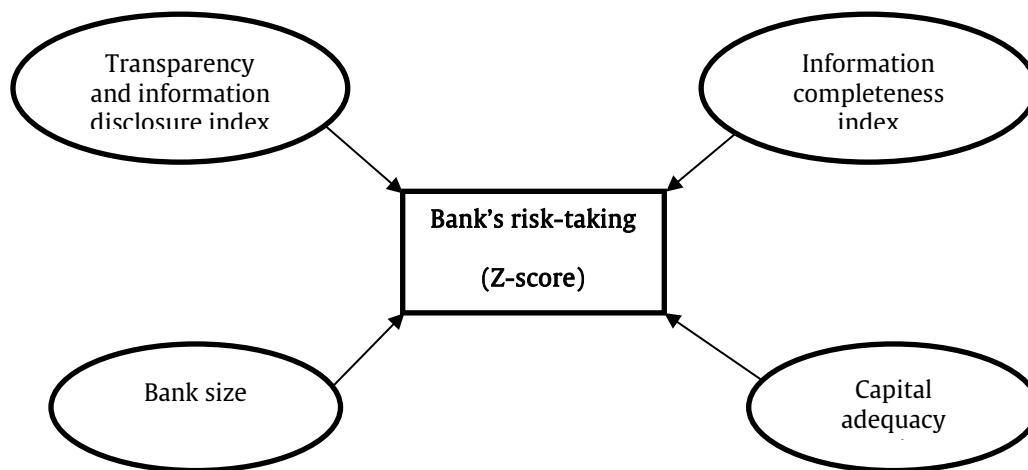


Figure 1: Analytical framework.

Source: authors' work.

METHODOLOGY

Sample selection

This paper used panel data of 28 Vietnamese commercial banks that met and were ready to reach the Basel II standard from 2007 to 2019. Basel II went into force in 2007, and the State Bank of Vietnam began to urge commercial banks to adopt this standard. Though, there are only 18 out of 34 commercial banks in Vietnam that successfully addressed Basel II until 2020. This paper divided the period into two: 2007–2014 as the pre-Basel and 2014–2019 as the post-Basel. This comes from the fact that in March 2014, the State Bank of Vietnam issued Document No. 1601/NHNN-TTGSNH, officially approving the roadmap for applying Basel II standards in the banking sector to 2019. The data utilized in this paper was obtained from the Bankscope database and commercial banks' governance reports.

Variables and Methodology

In this study, the Z-score is treated as the dependent variable since it is regarded as the proxy that assesses the probability of bankruptcy due to bank insolvency (Laeven & Levine, 2009). A bank with a greater Z-score is more secure, whereas a bank with a low Z-score has a higher risk. Given that the Z-score is highly skewed (Wang et al., 2018), this work uses the logarithm of the Z-score, which is denoted as the Z-score determined below:

$$Z - score = \ln \frac{ROA + \frac{Equity}{Total\ Assets}}{\sigma(ROA)}$$

Where ROA is the return of assets and $\sigma(ROA)$ is the standard deviation of ROA.

The independent variables include transparency and information disclosure index (TRANS); Information completeness index (DISC) and Control variables. In which, Transparency and information disclosure index (TRANS) is

calculated based on the indexes of the Information completeness index (DISC), Information opportunity index (UPDATE), Information credibility index (CRED), and Information accessibility index (ACCESS) (see Appendix). Four dimensions are expected to be equally important in building the composite index (Hodgdon et al., 2008). As a result, the authors created intermediate indexes without weights in the composite index generation process in order to eliminate the subjectivity issue. The method to build this index has been described in detail by the author in the study “Construction of Transparency and Disclosure Index for Commercial Banks in Vietnam” (Pham et al., 2021).

$$TRANS_{it} = \frac{DISC_{it} + UPDATE_{it} + CRED_{it} + ACCESS_{it}}{N}$$

$$TRANS_{it} =$$

$$\frac{\frac{1}{31} \sum_{k=1}^{31} Skit + \frac{1}{2} \sum_{k=32}^{33} Skit + \frac{1}{4} \sum_{k=34}^{37} Skit + \frac{1}{3} \sum_{k=38}^{40} Skit}{N}$$

Figure 2 depicts statistics on the 13-year average of bank disclosure for all banks in the study from 2007 to 2019. Between 2007 and 2019, the banking system's degree of information disclosure increased dramatically, rising from 0.4 in 2007 to around 0.9 in 2019. According to the findings, the transparency and disclosure index of the whole Vietnamese banking system has more than quadrupled in the last 13 years. However, the standard deviation between the disclosure degrees of banks in the system has grown, implying that the gap between banks is widening, with numerous commercial banks having a substantially lower disclosure score when compared to industry standards.

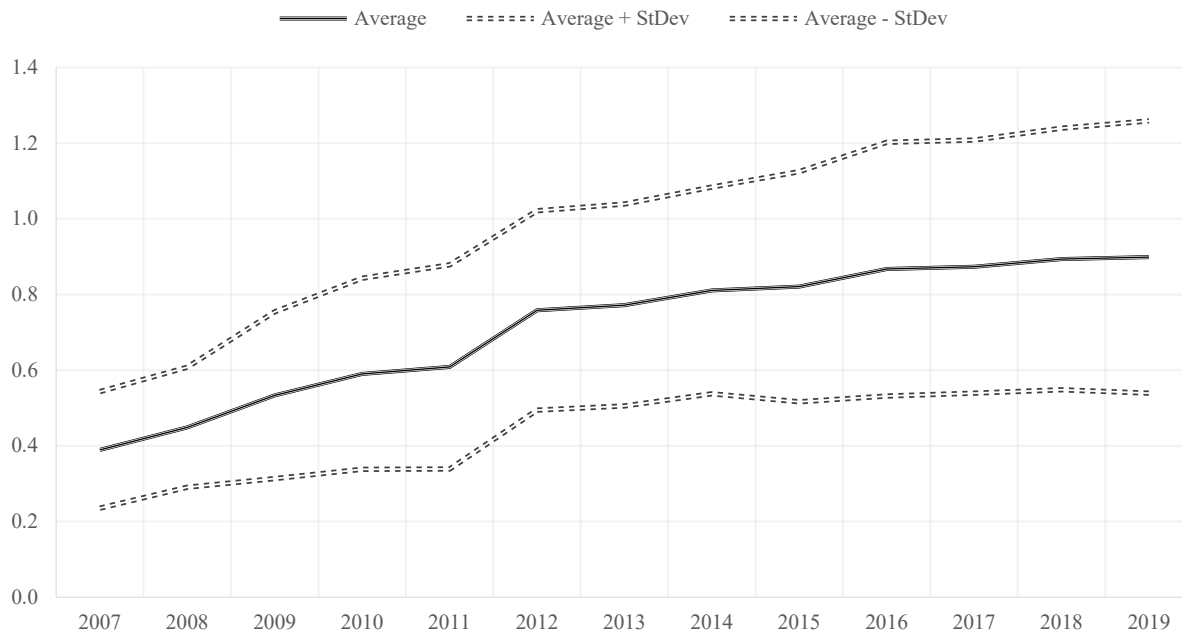


Figure 2: Bank disclosure index.

Source: authors' work.

The control variables include the Natural logarithm of total assets (SIZE), Capital adequacy ratio (CAR). Bank size is one of the factors that determine the transparency of banks' information. This paper assumes the bank size has a positive sign due to the "too big to fail" hypothesis, meaning the bigger the commercial bank in Vietnam, the more information that it has to disclose to the public to avoid the risk

coming from the board of management or employees' unethical behavior. Meanwhile, the capital adequacy ratio is considered one of the most important standards of Basel II because it evaluates a bank's capital position and also bank's financial stability.

Table 1: List of variables in the regression model

Variable		Abbreviation	Measurement
<i>Dependent variable</i>			
Z-score	Bank's risk-taking	Z-score	$Z - score = \ln \frac{ROA + \frac{Equity}{Total Assets}}{\sigma(ROA)}$
<i>Independent variables</i>			
Transparency and information disclosure index	Information completeness index	<i>DISC</i>	$DISC_{it} = \frac{1}{31} \sum_{k=1}^{31} S_{kit}$
	Information opportunity index	<i>UPDATE</i>	$UPDATE_{it} = \frac{1}{2} \sum_{k=32}^{33} S_{kit}$
	Information credibility index	<i>CRED</i>	$CRED_{it} = \frac{1}{4} \sum_{k=34}^{37} S_{kit}$
	Information accessibility index	<i>ACCESS</i>	$ACCESS_{it} = \frac{1}{3} \sum_{k=38}^{40} S_{kit}$
$TRANS_{it} = \frac{DISC+UPDATE+CRED+ACCESS}{N}$			
Information completeness index	Information completeness index	<i>DISC</i>	$DISC_{it} = \frac{1}{31} \sum_{k=1}^{31} S_{kit}$
Control variables	Natural logarithm of total assets	<i>SIZE</i>	
	Capital adequacy ratio	<i>CAR</i>	

Source: authors' work.

To estimate the model, the authors use a two-step system Generalized Method of Moments (GMM) approach combined with panel data of 28 Vietnamese commercial banks from 2007 to 2019 to assess the impact of the Transparency and information disclosure index (TRANS) and Information completeness index (DISC) on bank risk-taking before and after applying Basel II.

RESULTS AND DISCUSSION

Descriptive statistics

Table 2 includes the descriptive statistics of the data. Data were collected from 28 Vietnamese banks between 2007 and 2019, including two periods, 2007-2014 and 2014-2019.

Table 2: List of variables in the regression model

Variable	Obs	Mean	Std. dev	Min	Max
Pre-Basel					
Z-score	224	3.282	0.143	3.102	3.558
TRANS	224	0.604	0.27	0.131	1.153
DISC	224	0.73	0.233	0.528	1.032
SIZE	224	29.387	0.799	25.057	34.269
CAR	224	8.649	0.901	0	54.92

Variable	Obs	Mean	Std. dev	Min	Max
Post-Basel					
Z-score	140	3.991	0.082	2.895	4.108
TRANS	140	0.862	0.319	0.819	1.2
DISC	140	0.793	0.291	0.814	1.032
SIZE	140	31.152	0.602	30.513	34.937
CAR	140	8.99	0.623	0	24.530

Source: Result of data processing

Vietnam's commercial banks have a dramatic change when it comes to financial stability. The average Z-score in pre-Basel is 3.282, which is low compared to the maximum value (3.558), demonstrating that the level of commercial banks' soundness in Vietnam is low from 2007 to 2014. The TRANS has the most significant change before and after the application of Basel II for

commercial banks in Vietnam. Comparably, the bank-specific variable in completed information DISC also follows the upward trend, which the average ratio in table 2 is at 0.730 in pre-Basel and slightly rose to 0.793 after engaging Basel II in banks.

Table 3: The pairwise correlation matrix for variables

	Z-score	TRANS	DISC	SIZE	CAR
Z-score	1.0000				
TRANS	0.5043	1.0000			
DISC	0.2253	0.6944	1.0000		
SIZE	0.1871	0.3966	0.4104	1.0000	
CAR	0.6262	0.2334	0.2792	0.1270	1.0000

Source: Result of data processing

Correlation coefficients are used to measure how strong a relationship is between two variables. From table 3 results, the correlation coefficients of the variables are not greater than the standard rule of thumb 80%, so the independent variables have low correlations and are suitable for regression.

Regression estimates

Using Z-score as a dependent variable, this paper examines the regression equations below:

$$Z - score_{it} = \beta_0 + \beta_1 TRANS_{it} + \beta_2 Controls_{it} + \varepsilon_{it} \quad (1)$$

$$Z - score_{it} = \beta_0 + \beta_1 DISC_{it} + \beta_2 Controls_{it} + \varepsilon_{it} \quad (2)$$

Where $Z - score_{it}$ is the Z-score of bank i for period t , $TRANS_{it}$ is Transparency and information disclosure index for bank i in period

t , $DISC_{it}$ is the Information completeness index of bank i for period t , $Controls_{it}$ indicates the control variables of bank i for period t , ε_{it} is the error term.

Research results from Table 4 show that, after applying Basel II, the coefficients of Transparency and information disclosure index (TRANS) and Information completeness index (DISC) which impact the bank's risk-taking (Z-score) increased significantly, from 0.1925 to 0.3108 and from 0.184 to 0.395, respectively. It can be explained that after applying Basell II, Vietnamese commercial banks must strictly comply with regulations related to information disclosure in Pillar 3: Transparency and market discipline. Accordingly, Pillar III requires banks to disclose information appropriately according to market principles.

Table 4: Summarize the results of models (1) and (2), in pre-Basel II and post-Basel II

	All Z-score (1)	Pre-Basel II Z-score (1)	Post-Basel II Z-score (1)	All Z-score (2)	Pre-Basel II Z-score (2)	Post-Basel II Z-score (2)
SIZE	0.355** (0.46)	0.183** (0.84)	0.1072** (0.61)	0.170* (0.17)	0.0106** (0.35)	0.2874** (0.12)
CAR	0.125* (0.37)	0.0436** (0.58)	0.1582*** (1.24)	0.263* (0.16)	0.063** (0.94)	0.1839** (0.56)
TRANS	0.310** (0.16)	0.1925** (0.23)	0.3108** (1.09)			
DISC				0.387** (0.08)	0.184*** (0.39)	0.395*** (0.42)
_cons	3.104 (4.80)	3.175 (11.46)	3.246 (11.14)	3.058 (2.29)	3.648 (2.54)	3.046 (2.35)
t statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01						
N	364	224	140	364	224	140
Pro > chi2	0.0003	0.0000	0.0000	0.0008	0.0005	0.0023
R-squared	0.8599	0.8648	0.7684	0.8465	0.7868	0.8964

Source: Result of data processing

Basel II provides a list of requirements that require banks to disclose information including information on capital structure and capital adequacy, information related to the bank's sensitivity to credit risk, market risk, operational risk, and the bank's assessment process for each of these risks.

The coefficient of TRANS is 0.310, which is significant at the 5% level of significance. This finding indicates that the greater the index of transparency and information disclosure of a Vietnamese commercial bank, the safer the bank. This finding is consistent with Tadesse's (2005) and Hirtle's (2006) investigations (2007). Banks disclosing information publicly enables regulators to effectively evaluate banks' soundness and propose relevant solutions to assist banks in mitigating risks throughout operation. Additionally, the State Bank of Vietnam mandates Vietnamese commercial banks to increase their transparency in disclosing information about their business operations and risk management. The DISC coefficient is 0.387, which is statistically significant at a 1% level of significance. This finding is consistent with Wang et al (2018) investigation. The higher the DISC index, the more meticulous and comprehensive a bank is in managing risks.

SIZE has coefficients of 0.355 and 0.170 and is significant at the 5% and 10% significance levels, respectively. That is, the bigger the bank, the more secure it is. This finding is consistent with the findings of Demirgüç-Kunt et al (2008). Commercial banks in Vietnam, particularly state-owned joint-stock commercial banks, are constantly rigorously controlled in their lending operations and risk management. State-owned joint-stock commercial banks are big institutions that need more oversight since any default risk in these institutions would have a significant impact on the economy. A larger, more diversified bank has a well-defined plan for raising total assets, which makes banks safer (Demirgüç-Kunt et al. 2008).

The coefficient of CAR is calculated as 0.125 and 0.263 which is statistically significant at a 10% significance level. CAR is the necessary buffer for commercial banks to avoid potential risks and protect the depositors. In Vietnam, the State Bank of Vietnam issued Circular No. 13/2010/TT-NHNN issued on May 20, 2010 to increase the capital adequacy ratio of Vietnamese commercial banks to 9%, higher than the Basel II regulation of 8%. Furthermore, the State Bank of Vietnam has consistently encouraged commercial banks to increase CAR in

order to safeguard the safety of banks in particular and the financial system as a whole.

In summary, the coefficients of the explanatory variables show statistically significant positive impacts on the Z-score and these correlations are greater in the period after applying Basel II than in the previous period. The results further indicate that the State Bank of Vietnam's regulation in the application of international standards has had a positive consequence on improving the stability of the Vietnamese banking system.

CONCLUSION AND RECOMMENDATION

In conclusion, by using a two-step system Generalized Method of Moments (GMM) approach combined with panel data of 28 Vietnamese commercial banks from 2007 to 2019, this paper examines the factors affecting Vietnamese commercial banks' risk-taking, including transparency and information disclosure index (TRANS), Information completeness index (DISC), bank size and capital adequacy ratio (CAR), before and after the adoption of Basel II. According to the research result, banks with more transparent and comprehensive information disclosure will operate more safely. Banks with a larger size and a greater capital adequacy ratio also take less risk. Furthermore, this paper pioneered building a set of indexes to measure transparency and information disclosure of Vietnamese commercial banks and use it to assess bank risk-taking. Additionally, the study findings indicate that the implementation of Basel II contributes greatly to the influence of transparency and information disclosure on the Z-scores of Vietnamese commercial banks. Hence, our findings have crucial policy implications that the government should continue to promote the construction of the financial system by mandating banks to fully implement Basel II standards in general and information disclosure principles in particular.

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