Asian Economic and Financial Review
ISSN(e): 2222-6737
ISSN(p): 2305-2147
DOI: 10.18488/journal.aefr.2017.712.1211.1226
Vol. 7, No. 12, 1211-1226

URL: www.aessweb.com

BANK DISCLOSURES AND THEIR IMPACT ON CREDIT RISK: EVIDENCE FROM BANGLADESH

Changjun Zheng[1]
Niluthpaul Sarker[2+]
Shamsun Nahar[3]

[1,2]*School of Management, Huazhong University of Science and Technology, Wuhan, Hubei, P.R. China.*
[3]*School of Accounting, Zhongnan University of Economics and Law, Wuhan, Hubei, P.R. China.*

(+ Corresponding author)

Article History
Received: 12 September 2017
Revised: 5 October 2017
Accepted: 13 October 2017
Published: 17 October 2017

Keywords
Bank risk
Disclosure index
Bank ownership
PCSE
FGLS
Bangladesh.

JEL Classification
C12; C23; G21; G32.

ABSTRACT

The only way to ensure a well-informed response to bank risks is by ensuring transparent disclosures that flourish with potential synergy. This study investigates the impact of bank disclosures on credit risk where panel data are used. PCSE and FGLS regression models are applied to a sample of 32 commercial banks in Bangladesh from 2010 to 2014. The results reveal that bank disclosures index, non-sponsor ownership and advances to total assets are inversely associated with bank risk, whereas government ownership, capital adequacy ratio and tier 1 capital have a positive effect. The study's findings have a twofold implication for the national economy. First, the higher number of disclosures portrays a transparent image in users' minds that decreases stock volatility and the cost of capital. Second, policy makers should rethink government ownership with respect to the absorption of serious risk. Therefore, it is highly recommended either to denationalize or to reduce government ownership.

Contribution/ Originality: This study is one of very few studies which have investigated the relationship between bank disclosures and credit risk in the developing country context. It found that bank credit policies are tremendously affected by the government ownership. Thus, this paper will contribute to the research related to credit risk management.

1. INTRODUCTION AND MOTIVATION

Business is now regarded as corporate glass house in which both insiders and outsiders have a good view of their decisions—if and only if corporate reporting make it possible by providing more and relevant information. Financial information helps users make prudent decisions. Although business organizations regularly publish audited financial statements, they should also ensure the transparency of financial reporting. Recent economic disasters have generated a certain level of mistrust toward companies on the part of stakeholders (Madrigal *et al.*, 2015). To minimize conflicts, stakeholders demand more and better information regarding financial performance, social dimension and corporate risks.

Empirical studies (Fama and Jensen, 1983; Cebenoyan *et al.*, 1999) have revealed that asymmetric information induces banks to engage in riskier behavior. In this regard, transparent disclosures can mitigate the conflict and

confusion experienced by stakeholders in vulnerable economic situations. Another study (Cordella and Yeyati, 1998; Boot and Schmeits, 2000) has shown a negative relationship between disclosure and default risk. More recently, Baumann and Nier (2004) and Nier (2005) have found a negative relationship between bank disclosures and stock price volatility. In summary, it can be concluded that a high level of disclosures can trade off information heterogeneity and stabilize the banking sector during global financial turmoil.

This paper investigates the effect of published disclosures in annual reports on bank credit risk. Adequate risk disclosures can ensure more transparency and, importantly, can stabilize the banking sector. Financial crises are initiated by aggressive disclosures, whereas enhanced bank disclosures have the reverse effect (Hoggarth *et al*., 2003; Solomon, 2005). Financial disclosures have an increased level of importance in banking business but not in non-financial businesses. Transparent disclosures may reduce information asymmetry between internal (management or majority shareholder) and external (majority shareholders, creditors and other stakeholders) users of information. Annual reports are generally considered a reliable source of corporate information. Therefore, many researchers have concentrated on companies' annual reports to construct a disclosure index, identifying a positive correlation between disclosure levels and the amount of disclosure provided in other media (Lang and Lundholm, 1993).

This paper's motivation concerns the rational choice of the undermine economy in the South Asian region, which suffers from a lack of academic research. There has been very little research conducted in this area because of this region's social, cultural, political and economic vulnerability. Moreover, many researchers avoid South Asia as a sample because of the limited availability of information in the global database system. This study conducts a critical examination of the published annual reports of the commercial banks and shows the effect of disclosures on their risk-taking behavior. The study also investigates the probable relationship among the default risk and banks' ownership structure, financial performance and position. This work will add value to the national economy by formulating new rules and scrutinizing existing reporting conventions that can support a stable financial position over time.

The rest of the paper is organized as follows. The literature review and the construction of hypotheses on the impact of several factors based on bank-level information are contained in the second section. The research design is discussed in the third section, and the results are presented in the fourth section. The final sections summarize the discussion and presents implications for further research.

2. BACKGROUND AND RELATED LITERATURE

Disclosures play a vital role in the transparency of financial statements between both the insiders and the outsiders of an organization. Management sometimes provides inadequate information to the diverse users of financial statements, which usually fail to serve their purpose, mislead users or convey incorrect information about the organization (Fung, 2014). During the 1990s, most of the research on risk disclosure was based on desired outcomes, ignoring the actual form of disclosures (Woods *et al*., 2008).

Some researchers have advocated transparency, showing a statistical relationship between transparency and disclosures. Botosan (1997) empirical study found a weak relationship between asset pricing and disclosure. Another extensive study, conducted by Patel and Dallas (2002) observed an inverse relationship between disclosure and market risk. The study showed that both market risk and the cost of capital are higher in the case in which a company provides a lower amount of disclosure. Apparently, companies benefit from obtaining a market premium attributable to the provision of more information in the annual report than is required. The AICPA's special committee on financial reporting (American Institute of Certified Public Accountants (AICPA), 1994) found that the benefit of greater disclosure is a lower cost of equity. Bushee and Noe (2000) focused on the cross-sectional relationship between risk and disclosure. Several of the relevant theories related to risk disclosure are also stated below:

Table-1. Supporting theories

Theory	Theme & References
Stakeholder theory	The demand for risk-related information has a significant influence on the level of risk information disclosed by riskier firms, especially to influential stakeholders such as investors and creditors (Madrigala *et al.*, 2015)
Agency theory	Risk-taking perceptions are affected by ownership structure. Shareholders with a diversified portfolio have more incentives and power to influence decisions in a riskier direction, whereas managers are risk averse, keeping in mind their personal interests (Shleifer and Vishny, 1986)
Moral hazard hypothesis	One study found a negative association between risk and regulatory capital (CAR) and therefore, banks are motivated to absorb more risk based on a decrease in CAR (Berger and DeYoung, 1997).
Bad management hypothesis	One study revealed that inefficient banks may encounter difficulties in evaluating their bad loans and as a result, costs incurred as a result of bad management are related to higher default risk (Berger and DeYoung, 1997).

Source: Constructed by Author

2.1. Bank Credit Risk

In this study, we use the accounting measure of bank risk. Accounting-based risk can be measured by credit risk, overall risk, default risk, solvency risk, and liquidity risk. This study outlines the extent of the response variable as credit risk, which is the major representative of bank risk. Credit risk is calculated by the ratio of nonperforming loans to total loans (NPLR), and a higher risk for losses from loan defaults is associated with a higher ratio (Zhang *et al.*, 2013). This ratio is also used by Berger (1995); Shrieves and Dahl (1992) and Gonzalez (2005). Credit risk, also known as counter-party risk, has a significant influence in the banking sector (Al-Tamimi and Al-Mazrooei, 2007; Angelini *et al.*, 2008; Richard *et al.*, 2008; Lin, 2009). This influence is observed because a bank's performance largely depends on credit performance where ineffective credit policy breaks down banks' sustainability.

2.2. Bank Disclosures

In Asia, corporate disclosure requirements and transparency attracted regulatory attention after the 1997 financial crisis, which had a negative effect on investors' choices, with the result that international investors were reluctant to lend to developing countries. At that time, the IMF assumed a proactive role both to help the affected countries recover from the economic meltdown and to force the enactment of transparency in financial reporting systems (Fung, 2014). Researchers not only emphasize disclosure transparency but also encourage the development of a culture of organizational transparency (O'Toole and Bennis, 2009).

Baumann and Nier (2004) found that banks with more disclosures have less volatile stocks than banks with less disclosure. This finding confirms the "Stakeholder theory," which states that a greater amount of disclosure affirms users' rational choice and inversely affects bank risk. Risk disclosure reduces information asymmetry and attracts the notice of both informed and uninformed investors (Poskitt, 2005). However, Linsley and Shrives (2005) have concluded that disclosures themselves are never transparent when there is a lack of useful information. Prudent users make effective decisions based on market signals regarding a bank's financial position and performance. A high quality of disclosure can make this possible only through the fair presentation of bank statements. After examining market signals in a critical and timely manner, banks took corrective measures to reduce their exposure to risk (Oliveira *et al.*, 2011). Based on the empirical studies, we see a relationship between transparency and bank risk:

H_1 There is a significant negative relationship between the transparency of disclosures and bank risk.

2.3. Government Ownership

Government ownership represents the percentage of government shareholdings in banks. Theoretically, government ownership has both a positive and a negative impact on bank risk. Most of the evidence supports "agency theory" in the controlling group's risk-taking behavior. It is assumed that government-owned banks in developing countries struggle to strengthen both financial and economic development by implementing a social and political agenda and creating new opportunities for a weaker group of people in the vein of private financing (La Porta *et al.*, 2002). Behind the scenes, most government-owned banks have inefficient bureaucracies and lack access to the capital markets (Lassoued *et al.*, 2015). Shleifer and Vishny (1986) revealed that government-owned banks fight to implement political promises by approving inefficient projects; moreover, they engage in an excessive abuse of power. Lang and So (2002) found that managers of government-owned banks both engage in activities for their personal benefit and misuse resources. This inefficiency and political arrogance damages the supremacy of the rules and regulations that burden the banking sector (Bonin *et al.*, 2005). Several studies (Berger *et al.*, 2005; Angkinand and Wihlborg, 2010; Corneet *et al.*, 2010; Iannotta *et al.*, 2013) concluded that government-owned banks are positively associated with credit risk.

In validating these findings, we verify them in the context of developing countries, such as Bangladesh, stating our hypothesis:

H_2: There is a significant positive relationship between government ownership and bank risk.

2.4. Non-Sponsor Ownership

Non-sponsor ownership consists of institutions, general and other groups of bank shareholders. Ownership structure, one component of corporate governance, is influenced by banks' risk disclosures (Institute of Chartered Accountants in England and Wales (ICEAW), 1997). If the ownership is not spread throughout a diverse group, the bank's risk information is disclosed only in private meetings (Madrigal *et al.*, 2015). Several studies conducted on ownership structure have involved diverse stakeholder groups. It has been found that a wide diversity of stakeholders commonly ensures the disclosure of more information than a limited shareholding group (Jaggi and Low, 2000). There is no evidence of a significant relationship between non-sponsor ownership and risk-taking behavior. For this reason, the following hypothesis has been established:

H_3: There is a significant association between non-sponsor ownership and bank risk.

2.5. Capital Adequacy Ratio

CAR is the ratio of a bank's regulatory capital to risk-weighted assets and represents the reasonable amount of loss. In Bangladesh, banks' risk-based capital adequacy has been reported in financial statements under BASEL I since 1996. However, there has been no gradual improvement of these disclosures in banks' annual reports (Huang, 2006). Regulatory pressure increased in 2010 when BASEL II was adopted. Recently, Bangladesh Bank (the central bank of Bangladesh) promulgated a roadmap for BASEL III implementation from 2014 to 2019 through a systematic process (www.bb.org.bd, Banking Regulations and Policy Department's Circular No. 7, March 31, 2014). Mixed findings justify the association between the capital adequacy ratio (CAR) and bank risk (NPLR). Several authors (Rime, 2001; Lin *et al.*, 2005; Altunbas *et al.*, 2007; Leaven and Levine, 2009) revealed that regulatory capital (CAR) is positively associated with bank risk. In contrast, others found an inverse relationship between regulatory capital and bank risk (Ho and Hsu, 2010; Agoraki *et al.*, 2011; Lee and Chih, 2013). These studies support the "Moral hazard hypothesis (MHH)," which holds that banks with strong regulatory capital can absorb higher risk. In this situation, we derive the following hypothesis:

H_4: There is a significant negative relationship between capital adequacy and bank risk.

2.6. Inefficiency

Bank inefficiency is measured by the ratio of interest expense to interest income. The reason for this inefficiency is that banks operate to earn a profit, which is the differential figure between interest income and expense. To ensure the quality of earnings, banks must rely on the core ingredient of income, rather than other sources. In this case, inefficiency results in lower interest income through the inefficient distribution of loans and advances from total deposits. According to the "Bad Management" hypothesis, inefficiency is positively associated with a bank's credit risk. The possible cause for this is the increase of nonperforming loans, which silently deteriorate future earnings. Again, Kwan and Eisenbeis (1997); Altunbas *et al.* (2007) and Agusman *et al.* (2008) found that inefficiency is positively related to risk-taking; this finding is also supported by the "Moral Hazard Hypothesis (MHH)". These arguments suggest the following hypothesis:

H$_5$: There is a significant positive relationship between inefficiency and bank risk.

2.7. Advances to Total Assets

Advances to total assets measures banks' lending performance. Prior research (Brucker, 1970) found that the higher the proportion of resources placed in loans is, the better a bank's financial performance is. Advances to total assets measures a bank's ability and willingness to transform its idle deposits into productive resources. In this way, banks play a role in capital formation (Moulton, 1981). Usually, better lending performance depends on a bank's lower default risk. This evidence suggests the following hypothesis:

H$_6$: There is a relationship between advances to total assets and bank risk.

2.8. Tier 1 Capital

Tier 1 capital is the core measure of a bank's financial strength. Banks with such more capital are able to absorb loss events and can continue despite regulatory precautions. Tier 1 capital also determines the level of risk that a bank is willing to take. A change in Tier 1 capital independently changes risk in the same direction. Therefore, the following hypothesis has been established:

H$_7$: There is a significant positive relationship between Tier 1 capital and bank risk.

3. RESEARCH DESIGN

This study is based on a systematic process that ensures its trustworthiness[1]. To support the research findings, secondary data are used in an empirical quantitative fashion. The main sources of data are banks' annual reports because most developing and developed countries widely use annual reports as one major source (among others) of reliable information (Akhtaruddin, 2005; Alattar and Al-Khater, 2007; Catasús, 2008; Chau and Gray, 2010). Empirical studies (Naser and Nuseibeh, 2003; Al-Razeen and Karbhari, 2004) show that the annual report is a formal source of information in developing countries. However, the annual report is not the only source: shareholders can also retrieve information through either direct sources or media publications. In this regard, the study relies on annual reports as a major source of data. This study also examines a single country because Bangladesh's sociopolitical and economic environment is different from those of other countries in the Asian region. Moreover, there is a lack of adequate research in the field of risk disclosures in Bangladesh's financial sector.

3.1. Data

The dataset is constructed based on panel data consisting of 5 years (2010-2014) of time series data and 32 commercial banks' longitudinal data. There are 160 observations. In 2010, 47 banks operated in Bangladesh in 4

[1] Guba (1981). explained the trustworthiness of research, which is the combination of credibility (internal validity), transferability (external validity), dependability (reliability) and conformability (objectivity).

categories of scheduled banks: state-owned commercial banks (SCBs), development finance institutions (DFIs), private commercial banks (PCBs) and foreign commercial banks (FCBs). The structure of the banking sector broken down by bank type is shown below:

Table-2. Total assets, deposits and advances scenario by types of bank

Bank Type	2010(June)				2014 (June)				
	Number of Banks	Number of Branches	% of Industry Assets	% of Deposits	Number of Banks	Number of Branches	% of Industry Assets	% of Deposits	% of Advances
SCBs	4	3394	28.85	28.62	4	3536	26.5	26.1	17.86
PCBs	30	2427	57.55	59.11	39	3692	62.3	63.42	70.39
FCBs	4	59	7	6.93	9	70	5.8	5.11	4.64
DFIs	9	1366	6.6	5.34	9	1496	5.4	5.37	7.11
Total	**47**	**7246**	**100**	**100**	**56**	**8794**	**100**	**100**	**100**

Source: Bangladesh Bank (https://www.bb.org.bd)

The study focuses on both SCBs and PCBs because both capture the maximum percentages of industry assets, which are 87.73% in 2010 and 88.8% in 2014. Moreover, deposits show the highest and most significant amount, in contrast with other types of assets. That finding is why we have selected 4 SCBs and 28 PCBs (excluding 2 for outliers and report unavailability) as an experimental group.

3.2. Measurement of Variables

The dependent variable is the risk of the bank, which is measured by nonperforming loans to total loans (NPLR). This variable indicates the bank's default rate, which simultaneously affects the bank's overall position and performance. This study also identified several independent variables, based on prior research, to perform a statistical analysis to draw a conclusion about whether the effect of the independent variable changes the dependent variable to some extent. The independent variables are shown in the following table:

Table-3. Definition of Variables

Dependent variable: (NPLR) = Non-performing loan rate				
Hypotheses	**VARIABLES**	**Label**	**MEASUREMENT**	**Exp. Sign and relationship**
H1	Bank of Disclosures (**Appendix 1**)	BDI	A composite disclosure index measured the transparency of accounting information in published accounts	-
H2	Government Ownership	GOVOWN	Percentage of shares held by the government	+
H3	Non-Sponsor Ownership	NSOWN	Percentage of non-sponsor shareholdings.	+/-
H4	Capital Adequacy Ratio	CAR	Regulatory capital to risk-weighted assets	-
H5	Inefficiency	INEFFIC	Interest expense to interest income ratio	+
H6	Advances to total assets	ATA	Total loan and advances to total assets ratio	+/-
H7	Tier 1	TIER1	Tier 1 capital consists of common stock and disclosed reserves	+

Source: Constructed by Author

3.3. Methodology

To examine the transparency of disclosures' effect on banks' risk-taking behavior in Bangladesh's banking sector, we have generated the following regression model:

$$RISK_{it} = \beta_1 + \beta_2 \mathbf{TRANSP}_{it} + \beta_3 \mathbf{GOVOWN}_{it} + \beta_4 \mathbf{NSOWN}_{it} + \beta_5 \mathbf{CAR}_{it} + \beta_6 \mathbf{INEFFIC}_{it} + \beta_7 \mathbf{ATA}_{it} + \beta_8 \mathbf{TIER1}_{it} + \varepsilon$$

Where

i = 1;2;3.....;32 n = 32 (banks)

t = 2010;.....;2014 t = 5 (years)

The regression model is separately employed for the two variables (GOVOWN and NSOWN). The nature of the dataset is panel data. Several studies (Hsiao, 1986; Baltagi, 2001) observed that panel data control individual heteroskedasticity, reducing both multicollinearity and the biased estimation problem. In our study, we examine the heteroskedasticity (White) test, which accepts the null hypothesis at the 1% significance level and tests serial correlation (the Breusch-Godfrey serial correlation LM test), which is also significant at the 1% level. These diagnoses suggest the rejection of the ordinary least square (OLS) method to test the model. The correlated random effect (Hausman test) ensures that there is a random effect on the given dataset. Additional analyses are conducted based on further diagnosis to support the outcome of the research. The dataset is restricted because of the problem of heteroskedasticity, cross-sectional correlation and first-order autoregressive correlation AR (1) in the error terms. The Feasible Generalized Least Square (FGLS) and Prais Winsten Regression (PCSE) methods can overcome the limitation of the existing dataset (Wooldridge, 2006). These methods enable cross-sectional correlation and heteroskedasticity across panels. In our study, we interpret the results using both methods to prove the robustness of the model. In the independent variables, there is a strong collinearity between GOVOWN and NSOWN. To avoid bias, we formulate two variables separately in the regression model.

4. RESULTS

4.1. Descriptive Statistics

The descriptive statistics presented in **Table 4** were constructed using SPSS 17 for thirty-two (32) commercial banks from 2010 to 2014. The response variable (NPLR) has a very small deviation: 5.52% within the year and among the banks. This also reveals that for 2012, 2013 and 2014, a government-owned bank (Sonali Bank Ltd.) has the maximum non-performing loan rate (NPLR), at 33.09%, 30.01% and 25.44%, respectively. In the explanatory variables, BDI has a mean value of 91.58%, which is close to the minimum and maximum values of 80.95% and 95.25%. The reason for this finding that there is regulatory pressure for mandatory disclosure of risk-related information in annual reports. The most noticeable figure is the minimum value of CAR, which is -6.15%, although the average value is 11.19%, which is greater than the minimum capital requirement of 10%. In 2012, two (2) government-owned banks (Agrani Bank Ltd. and Sonali Bank Ltd.) had a negative capital adequacy ratio. Thus, we can infer that government-owned banks are reluctant to address risk-related information properly. These banks violate the minimum capital requirement rules even in the presence of both strong regulatory pressure and monitoring forces. Moreover, it is also remarkable that INEFFIC contains maximum a value of 144.51%, which indicates a high level of inefficiency, as well as management failure. It was also evidenced that for 2012, 2013, and 2014, one government-owned bank (Sonali Bank Ltd.) incurs more interest expense than interest income.

Table-4. Descriptive Statistics

Variables	N	Mean	Std. Dev.	Min	Max
NPLR	160	5.74%	5.52%	0.73%	33.09%
BDI	160	91.58%	4.08%	80.95%	95.24%
GOVOWN	160	12.51%	33.17%	0%	100%
NSOWN	160	53.72%	24.37%	0%	96.57%
CAR	160	11.19%	2.29%	-6.15%	15.15%
INEFFIC	160	72.85%	14.22%	42.10%	144.51%
ATA	160	65.26%	9.49%	7.44%	83.75%
TIER1	160	9.279257	0.524581	7.129898	10.46384

Source: Constructed by Author

A Spearman correlation analysis was performed to show the relationship between the explained variable (NPLR) and explanatory variables using SPSS 17. The results are shown in **Table 5** below. This table shows that the variables GOVOWN and INEFFIC have a strong positive correlation with the explained variable NPLR (0.764 and 0.528) and are statistically significant (P<0.01). Furthermore, the variables NSOWN and ATA have a strong negative correlation of -0.613 and -0.744 with NPLR and are statistically significant (P<0.01). BDI has a very low negative correlation with NPLR and is statistically significant (P<0.05).

The table also shows the relationship among explanatory variables. It is found that NSOWN and GOVOWN have a strong negative correlation of -0.799. Therefore, we develop two (2) distinct models considering that each has a separate effect on NPLR. The remaining variables are statistically significant but have a low correlation to each other.

Table-5. Spearman correlation matrix

	NPLR	BDI	NSWNS	GOVOWN	CAR	EFFIC	ATA	Tier1
NPLR	1							
BDI	-.177*	1						
NSOWN	-.613**	0.097	1					
GOVOWN	.764**	-0.102	-.799**	1				
CAR	-.441**	-0.047	.332**	-.428**	1			
INEFFIC	.528**	0.003	-.354**	.370**	-.203**	1		
ATA	-.744**	0.094	.417**	-.562**	0.112	-.439**	1	
Tier1	.254**	-0.107	-0.15	.219**	0.109	0.12	-0.132	1

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

4.2. Baseline Models

The baseline regression examines the association between the explained variable (NPLR) and the explanatory variables (BDI, GOVOWN, NSOWN, CAR, INEFFIC, ATA and TIER1). The study uses the Paris Winsten Regression (PCSE) and the Feasible Generalized Least Square Regression (FGLS) methods. The initial test result found that the dataset is affected by heteroskedasticity and the serial correlation problem.

Although some authors (Andres and Vallelado, 2008; Wintoki *et al.*, 2012) found that bank disclosure (BDI), ownership (GOVOWN and NSOWN) and regulatory capital (CAR) are endogenous variables with respect to risk (NPLR), our study confirms that these variables are exogenous variables. Moreover, we test whether there is any lag effect on the model, but the result shows that the current year positions are not affected by the previous year data.

Table 6 shows that bank risk disclosure (BDI) is negatively associated with bank risk (NPLR) in both models. Model I (PCSE) shows that BDI is significant (p<0.05 and p<0.10) in both situations of ownership structure (GOVOWN, NSOWN), and Model II (FGLS) reconfirms the association in the same direction at the 1% level of significance. The result is valid and similar to previous studies (Jaggi and Low, 2000; Corneet *et al.*, 2010; Oliveira *et al.*, 2011; Iannotta *et al.*, 2013). The fact underlying this outcome is that if banks publish adequate risk-related information in their annual reports, they will be more transparent and will be able to reduce risk. In this way, both bank and customer submit to pressure by disclosing information, which is available to concerned groups, regarding credit default.

In the ownership structure (GOVOWN and NSOWN), Models I and II confirm that GOVOWN and NSOWN are statistically significant (p<0.01), but GOVOWN is positively associated with NPLR, whereas NSOWN has an inverse effect. Previous studies (Berger *et al.*, 2005; Angkinand and Wihlborg, 2010; Corneet *et al.*, 2010; Iannotta *et al.*, 2013) advocate and validate the current result. Most of Bangladesh's political parties make promises to the people to obtain a mandate in national elections. This is why they are trying to implement their political agenda by investing more money in social projects (Shleifer and Vishny, 1986). Accordingly, a higher percentage of non-

sponsor owners results in less risky bank behavior (Jaggi and Low, 2000). The reason is that the heterogeneous composition of shareholders ensures more public disclosure than private disclosure of information (Madrigal *et al.*, 2015). It also supports the "stakeholder theory" that diverse groups seek more information so that they can make prudent decisions that will negatively affect risk.

The Capital Adequacy Ratio (CAR) in Models I and II are negatively associated with bank default risk (NPLR) and are statistically significant (p<.01), similar to Ho and Hsu (2010); Agoraki *et al.* (2011); Lee and Hsieh (2013); and Lee and Chih (2013). In Bangladesh, we find that most of the commercial banks, especially private banks are very concerned about both regulatory capital requirements and credit policy. They are concerned about granting credits in unproductive sectors, ignoring pressure by outsiders. For this reason, regulatory capital (CAR) is negatively associated with bank default risk (NPLR) in Bangladesh.

Table-6. Panel data regression of the bank risk (nonperforming loans) on the extent of voluntary disclosure of financial information by commercial banks in Bangladesh from 2010-2014

Variables	Model I (PCSE)		Model II (FGLS)	
	NPLR	NPLR	NPLR	NPLR
BDI	-.135617**	-.1410421*	-.1372012***	-.142055***
	.0668001	.0722	.0483498	.0509305
GOVOWN	.0004636***	-	.0005255***	-
	.0001006	-	.0000823	-
NSOWN	-	-.000428***	-	-.0004661***
	-	.0001318	-	.0001
CAR	-.0068957***	-.0074515***	-.0058753***	-.0074033***
	.0008422	.0008328	.00099	.0009714
INEFFIC	.0544388***	.0557377***	.0586532***	.054761***
	.0186571	.0197188	.0155815	.0165582
ATA	-.2700858***	-.2952897***	-.2603279***	-.3091196***
	.0275591	.0272025	.0265086	.0253785
TIER1	.0103826**	.0115428**	.0130136***	.0166827***
	.0045213	.0046864	.0039199	.0040363
CONS	.2935801***	.3383962***	.2485619***	.3023438***
	.0795145	.0845138	.0628042	.0655444
Observations	160	160	160	160
Number of Banks	32	32	32	32
R-squared	71.28%	68.24%	-	-
Adj. R-squared	70.16%	67%	-	-

Reported in parentheses are standard errors. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

Models I and II both indicate that bank inefficiency (INEFFIC) is positively associated with bank default risk (NPLR) and is statistically significant (p<.001). This finding confirms the existing theories of the "Bad Management Hypothesis" and the "Moral Hazard Hypothesis (MHH)". Prior research by Kwan and Eisenbeis (1997); Altunbas *et al.* (2007) and Agusman *et al.* (2008) arrived at a similar result. The main reason is the *income diversification*[2] of banks; somehow, economic fluctuations have affected banks' interest rates from 2010 to 2014.

Banks' lending performance (ATA) in Models I and II shows an inverse relationship with bank risk (NPLR) and is statistically significant at the 1% level. Although there is little evidence to establish the relationship between ATA and NPLR, Brucker (1970) revealed that better financial performance by a bank depends on the placement of a high proportion of bank resources in loans, implying a negative association with default risk (NPLR). Bank performance depends entirely on lower default risk (NPLR) and ensures higher management efficiency.

[2] According to Chaibi and Ftiti (2015). and Louzis, Vouldis and Metaxas (2012). income diversification (ID) refers to banks' dependency on non-interest income.

Tier 1 capital is positively associated with bank default risk and is statistically significant in both Model I (P<0.05) and Model II (P<0.10). This result implies that higher Tier 1 capital (Core Capital) stimulates banks to take more risk to capture the market. In Bangladesh, it is found that the number of banks increased to 19.15% from 2010 to 2014. Thus, competition among banks is increasing every day. Some banks adopt an aggressive strategy to sustain the market with a higher market share, tempting them to grant more credit in a diverse manner that involves absorbing higher risk. Sometimes, banks cannot flourish in catering to the masses because of the existence of strong competitors such as non-bank financial institutions and NGOs. Microfinance[3] policy is one of the most successful projects in Bangladesh that reaches out to the masses, distributing no-collateral loans without strict regulations. This entire scenario prompts banks to take more risk to uphold a higher level of Tier 1 capital.

4.3. Robustness Checks

The previous analyses allow us to assess the robustness of the model. To verify the consistency of the result, we use default risk proxy as loan loss provision to total loan (NPLR). Similarly, we change the CAR measurement to Tier 1 plus Tier 2 divided by total assets, also revealing banks' capital adequacy ratio. We also conducted the initial diagnosis of the Hausman random effect test, the White heteroskedasticity test, the LM serial correlation test and the endogenous test. The result reveals that the dataset has a random effect and the variables are exogenous, but there is problem of heteroskedasticity and autocorrelation. In this situation, Wooldridge (2006) suggested using PCSE and FGLS regression model to test the hypothesis. According, we conduct an operation similar to our previous analysis.

Table-7. Panel data regression of bank risk (Loan loss provision) on the extent of voluntary disclosure of financial information of commercial banks in Bangladesh from 2010-2014

Variables	Model I (PCSE)		Model II (FGLS)	
	NPLR	NPLR	NPLR	NPLR
BDI	-.0918315*	-.0946367*	-.1009311***	-.1038668***
	(.049287)	(.0546287)	(.0329463)	(.0355409)
GOVOWN	.0003419***	-	.0003881***	-
	(.000075)	-	(.0000573)	-
NSOWN	-	-.0002874***	-	-.0003179***
	-	(.0000985)	-	(.0000743)
CAR	-.4067812***	-.4668184***	-.2965783***	-.3975049***
	(.0741764)	(.0746412)	(.0751387)	(.078743)
INEFFIC	.0313497**	.0308601**	.0387255***	.0356337***
	(.012932)	(.0136651)	(.0108706)	(.0117543)
ATA	-.0691378***	-.0783455***	-.0788494***	-.1081134***
	(.0170884)	(.0172325)	(.0179446)	(.0184502)
TIER1	.0059911*	.0072343**	.0080643***	.0110128***
	(.0031659)	(.0032831)	(.0027352)	(.0028776)
CONS	.1107257**	.1335798**	.0894261**	.1173715**
	(.0558638)	(.0607738)	(.0421965)	(.0454431)
Observations	160	160	160	160
Number of Banks	32	32	32	32
R-squared	0.5803	0.5272	-	-
Adj. R-squared	0.5639	0.5087	-	-

Reported in parentheses are standard errors. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

Table 7 shows that bank default risk (NPLR) is significantly affected by all of the dependent variables. In comparing the models, it shows that Model II (FGLS) provides more consistent results in robust tests with the

[3] Muhammad Yunus was awarded the Nobel Peace Prize in 2006 for founding the Grameen Bank and pioneering the concepts of microcredit and microfinance.

baseline model. In Model I (PCSE), the significance level changes from 5% to 10% for BDI, 1% to 5% for INEFFIC and 5% to 10% for the Tier 1 variable when the GOVOWN variable is used. However, in the application of NSOWN, only the significance level of the INEFFIC variable changes from the 10% to the 5% level. In both cases, we can say that the model is best fit because more than 50% of the data are explained by the independent variables. Moreover, there is no change of coefficient direction compared to baseline models.

5. CONCLUSIONS

In Bangladesh, there is stiff competition in the financial market to attract the attention of investors. To satisfy stakeholders' needs, financial institutions, such as banks, should provide more information in their annual reports such that all concerned groups (both internal and external) can make prudent decisions. The information provider must ensure that the information has qualitative characteristics (relevance, reliability, comparability and consistency). The study reveals that adequate disclosure can beat the market and minimize risks, ultimately improving the bank's bottom line. Transparent disclosures not only ensure profitability but also create permanent reliance by investors, decreasing future uncertainties. It is found that disclosing more information about key items minimizes the bank's risk and establishes a transparent image in the marketplace. The results also indicate that government ownership increases bank risk because of the establishment of a political agenda involving the use of excessive power, whereas an increase in non-sponsor ownership inversely affects risk because diverse groups concurrently affect investment decisions through their risk-neutral behavior. The remaining variables behave the same as they do in earlier research. The results of the tested hypothesis are provided below:

Table-8. Summary of hypothesis

N	Hypotheses	Decision
H_1	There is a significant negative relationship between bank disclosure and bank risk.	Not to Reject
H_2	There is a significant positive relationship between government ownership and bank risk.	Not to Reject
H_3	There is a significant association between non-sponsor ownership and bank risk.	Not to Reject
H_4	There is a significant negative relationship between capital adequacy and bank risk.	Not to Reject
H_5	There is a significant positive relationship between inefficiency and bank risk.	Not to Reject
H_6	There is a relationship between advances to total assets and bank risk.	Not to Reject
H_7	There is a significant positive relationship between tier 1 capital and bank risk.	Not to Reject

Source: Constructed by Author

Our study supports the enhancement of transparent disclosure with a strong governance mechanism that can minimize the rapid growth of risk. Issues relating to bank risk should be properly addressed both by the regulatory bodies and by bank management, presenting a united front to ensure a better financial position in the market. Stable financial positions attract legitimate investors and can prevent market disorder.

5.1. Contribution of the Study

This study's primary contribution is empirical evidence of the relationship between bank disclosure, ownership style, other bank-level variables and bank default risk in Bangladesh, which is an overlooked research area in the Asian region. This is the first research conducted in Bangladesh in this area. Further research could compare most of the literature developed from Western countries with the current study.

Second, there is very little evidence of single-country experiments in bank-risk disclosures. Previous studies have been conducted by Amran *et al.* (2009); Othman and Ameer (2009); Murugesu and Santhapparaj (2010) and Ismail and Rahman (2011) in Malaysia. Moreover, our study adds value as a single-country experiment because each country has its own style of operations based on its socioeconomic culture.

Third, the study identified a serious concern regarding ownership style in that government involvement positively affects the risk of the bank, providing policy makers with evidence that supports either denationalizing or significantly reducing government ownership of existing banks in the future.

5.2. Further Research

This study covers the period before the implementation of BASEL III in the banking sector. For this reason, there is an opportunity to extend the research by comparing the scenario before and after the implementation of BASEL III. Although banks regularly publish reports with different dimensions of disclosures, the quality of those disclosures raises questions. Therefore, there is another opportunity to support transparent disclosure by comparing quality with quantity. Furthermore, there is a chance to justify the different types of bank risk with BASEL III disclosure requirements and corporate governance structure. These will result in a positive change in policy makers' mindset with respect to formulating updated rules and regulations that could enrich our national economy.

Funding: This study received no specific financial support.
Competing Interests: The authors declare that they have no competing interests.
Contributors/Acknowledgement: All authors contributed equally to the conception and design of the study.

REFERENCES

Agoraki, M.K., M.D. Delis and F. Pasiouras, 2011. Regulations, competition and bank risk-taking in transition countries. Journal of Financial Stability, 7(1): 38-48. *View at Google Scholar* | *View at Publisher*

Agusman, A., G.S. Monroe, D. Gasbarro and J.K. Zumwalt, 2008. Accounting and capital market measures of risk: Evidence from Asian banks during 1998-2003. Journal of Banking and Finance, 32(4): 480-488. *View at Google Scholar* | *View at Publisher*

Akhtaruddin, M., 2005. Corporate mandatory disclosure practices in Bangladesh. International Journal of Accounting, 40(4): 399–422. *View at Google Scholar* | *View at Publisher*

Al-Razeen, A. and Y. Karbhari, 2004. Interaction between compulsory and voluntary disclosure in Saudi Arabian corporate annual reports. Managerial Auditing Journal, 19(3): 351–360. *View at Google Scholar* | *View at Publisher*

Al-Tamimi, H.A.H. and F.M. Al-Mazrooei, 2007. Bank's risk management: A comparison study of UAE national and foreign banks. Journal of Risk Finance, 8(4): 394-409. *View at Google Scholar* | *View at Publisher*

Alattar, J.M. and K. Al-Khater, 2007. An empirical investigation of users' views on corporate annual reports in Qatar. International Journal of Commerce and Management, 17(4): 312–325. *View at Google Scholar* | *View at Publisher*

Altunbas, Y., S. Carbo, E.P.M. Gardener and P. Molyneux, 2007. Examining the relationships between capital, risk and efficiency in European banking. European Financial Management, 13(1): 49-70. *View at Google Scholar* | *View at Publisher*

American Institute of Certified Public Accountants (AICPA), 1994. Improving business reporting-a customer focus: A comprehensive report of the special committee on financial reporting. New York: AICPA.

Amran, A., A.M.R. Bin and B.C.H.M. Hassan, 2009. Risk reporting: An exploratory study on risk management disclosure in Malaysian annual reports. Managerial Auditing Journal, 24(1): 39-57. *View at Google Scholar* | *View at Publisher*

Andres, P.D. and E. Vallelado, 2008. Corporate governance in banking: The role of the board of directors. Journal of Banking and Finance, 32(12): 2570-2580. *View at Google Scholar* | *View at Publisher*

Angelini, E., D.D. Tolly and A. Roli, 2008. A neutral network approach for credit risk evaluation. Quarterly Review of Economics and Finance, 48(4): 733-755. *View at Google Scholar*

Angkinand, A. and C. Wihlborg, 2010. Deposit insurance coverage, ownership and banks' risk taking in emerging markets. Journal of International Money and Finance, 29(2): 252-274. *View at Google Scholar* | *View at Publisher*

Baltagi, B., 2001. Econometric analysis of panel data. 2nd Edn., Chichester: John Wiley and Sons.

Baumann, U. and E. Nier, 2004. Disclosure, volatility and transparency. Economic Policy Review, 10(2): 31-45. *View at Google Scholar*

Berger, A.N., 1995. The relationship between capital and earnings in banking. Journal of Money, Credit and Banking, 27(2): 432-456. *View at Google Scholar* | *View at Publisher*

Berger, A.N., G.R. Clarke, R. Cull, L. Klapper and G. Udell, 2005. Corporate governance and bank performance: A joint analysis of the static, selection and dynamic effects of domestic, foreign and state ownership. Journal of Banking and Finance, 29(8): 2179-2221. *View at Google Scholar | View at Publisher*

Berger, A.N. and R. DeYoung, 1997. Problem loans and cost efficiency in commercial banks. Journal of Banking and Finance, 21(6): 849-870. *View at Google Scholar | View at Publisher*

Bonin, J.P., I. Hasan and P. Wachtel, 2005. Bank performance, efficiency and ownership in transition countries. Journal of Banking and Finance, 29(1): 31-53. *View at Google Scholar | View at Publisher*

Boot, A.W.A. and A. Schmeits, 2000. Market discipline and incentive problems in conglomerate firms with applications to banking. Journal of Financial Intermediation, 9(3): 240–273. *View at Google Scholar | View at Publisher*

Botosan, C.A., 1997. Disclosure level and the cost of equity capital. Accounting Review, 72(3): 323-349. *View at Google Scholar*

Brucker, E., 1970. An economic approach to banking competition. Journal of Finance, 25(5): 1133-1144. *View at Google Scholar*

Bushee, B.J. and C.F. Noe, 2000. Corporate disclosure practices, institutional investors and stock return volatility. Journal of Accounting Research, 38(3): 171-202. *View at Google Scholar | View at Publisher*

Catasús, B., 2008. In search of accounting absence. Critical Perspectives on Accounting, 19(7): 1004–1009. *View at Google Scholar | View at Publisher*

Cebenoyan, A.S., E.S. Cooperman and C.A. Register, 1999. Ownership structure, charter value, and risk-taking behavior for thrifts. Financial Management, 28(1): 43-60. *View at Google Scholar | View at Publisher*

Chaibi, H. and Z. Ftiti, 2015. Credit risk determinants: Evidence from a cross-country study. Research in International Business and Finance, 33: 1-16. *View at Google Scholar | View at Publisher*

Chau, G. and S.J. Gray, 2010. Family ownership, board independence and voluntary disclosure: Evidence from Hong Kong. Journal of International Accounting, Auditing and Taxation, 19(2): 93–109. *View at Google Scholar | View at Publisher*

Cordella, T. and E.L. Yeyati, 1998. Public disclosure and bank failures. International Monetary Fund Staff Papers, 45(1): 110-131. *View at Google Scholar | View at Publisher*

Corneet, M.M., L. Guo, S. Khaksari and H. Tehranian, 2010. The impact of state ownership on performance differences in privately-owned verses state-owned banks: An international comparison. Journal of Financial Intermediation, 19(1): 74-94. *View at Google Scholar | View at Publisher*

Fama, E.F. and M.C. Jensen, 1983. Separation of ownership and control. Journal of Law and Economics, 26(2): 301-325. *View at Google Scholar*

Fung, B., 2014. The demand and need for transparency and disclosure in corporate governance. Universal Journal of Management, 2(2): 72-80. *View at Google Scholar | View at Publisher*

Gonzalez, F., 2005. Bank regulation and risk-taking incentives: An international comparison of bank risk. Journal of Banking & Finance, 29(5): 1153-1184. *View at Google Scholar | View at Publisher*

Guba, E.G., 1981. Criteria for assessing the trustworthiness of naturalistic inquiries. Educational Communication and Technology Journal, 29(2): 75-91. *View at Google Scholar*

Ho, S.J. and S. Hsu, 2010. Leverage, performance and capital adequacy ratio in Taiwan"s banking industry. Japan and the World Economy, 22(4): 264-272. *View at Google Scholar | View at Publisher*

Hoggarth, G., P. Jackson and E. Nier, 2003. Banking crises and the design of the safety net. Paper Presented at the Ninth Dubrovnik Economic Conference, Dubrovnik, 26-28 June 2003.

Hsiao, C., 1986. Analysis of panel data. 2nd Edn., United Kingdom: Cambridge University Press.

Huang, R., 2006. Bank disclosure index: Global assessment of bank disclosure practices. Retrieved from http://dx.doi.org/10.2139/ssrn.1425915.

Iannotta, G., G. Nocera and A. Sironi, 2013. The impact of government ownership on bank risk. Journal of Financial Intermediation, 22(2): 152-176. *View at Google Scholar | View at Publisher*

Institute of Chartered Accountants in England and Wales (ICEAW), 1997. Financial reporting of risk: Proposals for a statement of business risk. London: The Institute of Chartered Accountants in England and Wales.

Ismail, R. and R.A. Rahman, 2011. Institutional investors and board of directors' monitoring role on risk management disclosure level in Malaysia. IUP Journal of Corporate Governance, 10(2): 37-61. *View at Google Scholar*

Jaggi, B. and P.Y. Low, 2000. Impact of culture, market forces, and legal system on financial disclosures. International Journal of Accounting, 35(4): 495-519. *View at Google Scholar* | *View at Publisher*

Kwan, S. and R.A. Eisenbeis, 1997. Bank risk, capitalization and operating efficiency. Journal of Financial Service Research, 12(2/3): 117-131. *View at Google Scholar* | *View at Publisher*

La Porta, R., L. Florencio, S. Andrei and W. Robert, 2002. Government ownership of banks. Journal of Finance, 57(1): 634-657. *View at Google Scholar*

Lang, L. and R. So, 2002. Bank ownership structure and economic performance. SSRN Working Paper.

Lang, M. and R. Lundholm, 1993. Cross-sectional determinants of analyst ratings of corporate disclosures. Journal of Accounting Research, 31(2): 246–271. *View at Google Scholar* | *View at Publisher*

Lassoued, N., H. Sassi and M.B.R. Attia, 2015. The impact of state and foreign ownership on banking risk: Evidence from the MENA countries. Research in International Business and Finance, 36: 167-178. *View at Google Scholar* | *View at Publisher*

Leaven, L. and R. Levine, 2009. Bank governance, regulation and risk taking. Journal of Financial Economics, 93(2): 259-275. *View at Google Scholar* | *View at Publisher*

Lee, C.C. and M.F. Hsieh, 2013. The impact of bank capital on profitability and risk in Asian banking. Journal of International Money and Finance, 32(c): 251-281. *View at Google Scholar* | *View at Publisher*

Lee, T. and S. Chih, 2013. Does financial regulation affect the profit efficiency and risk of banks? Evidence from China"s commercial banks. North American Journal of Economics and Finance, 26: 705-724. Retrieved from https://www.sciencedirect.com/.

Lin, S.L., 2009. A new two stage hybrid approach of credit risk in banking industry. Expert Systems with Applications, 36(4): 8333-8341. *View at Google Scholar* | *View at Publisher*

Lin, S.L., J.H.W. Penm, S. Gong and C. Chang, 2005. Risk-based capital adequacy in assessing on insolvency-risk and financial performances in Taiwan"s banking industry. Research in International Business and Finance, 19(1): 111-153. *View at Google Scholar* | *View at Publisher*

Linsley, P.M. and P.J. Shrives, 2005. Transparency and the disclosure of risk information in the banking sector. Journal of Financial Regulation and Compliance, 13(3): 205-214. *View at Google Scholar* | *View at Publisher*

Louzis, D.P., A.T. Vouldis and V.L. Metaxas, 2012. Macroeconomic and bank-specific determinants of non-performing loans in Greece: A comparative study of mortgage, business and consumer loan portfolios. Journal of Banking & Finance, 36(4): 1012-1027. *View at Google Scholar* | *View at Publisher*

Madrigal, M.H., B.A. Guzman and C.A. Guzman, 2015. Determinants of corporate risk disclosure in large Spanish companies: A snapshot. Contaduria y Administraction, 60(4): 757-775. *View at Google Scholar* | *View at Publisher*

Madrigala, M.H., B.A. Guzmánb and C.A. Guzmánb, 2015. Determinants of corporate risk disclosure in large Spanish companies: Asnapshot. Contaduríay Administración, 60(4): 757-775. *View at Google Scholar* | *View at Publisher*

Moulton, H.G., 1981. Commercial banking and capital formation. New York: St. Martins Press.

Murugesu, J. and A.S. Santhapparaj, 2010. Impact of risk disclosure in the prospectus on valuation and initial returns of initial public offerings in Malaysia. IUP Journal of Applied Finance, 16(6): 30-53. *View at Google Scholar*

Naser, K. and R. Nuseibeh, 2003. Users' perceptions of corporate reporting: Evidence from Saudi Arabia. British Accounting Review, 35(2): 129–153. *View at Google Scholar* | *View at Publisher*

Nier, E. and U. Baumann, 2006. Market discipline, disclosure and moral hazard in banking. Journal of Financial Intermediation, 15(3): 332-361. *View at Google Scholar* | *View at Publisher*

Nier, E.W., 2005. Bank stability and transparency. Journal of Financial Stability, 1(3): 342-354. *View at Google Scholar* | *View at Publisher*

O'Toole, J. and W. Bennis, 2009. What's needed next: A culture of candor. Harvard Business Review, 87(6): 54-61. *View at Google Scholar*

Oliveira, J., L.L. Rodrigues and R. Craig, 2011. Risk-related disclosure practices in the annual reports of Portuguese credit institutions: An exploratory study. Journal of Banking Regulation, 12(2): 100-118. *View at Google Scholar | View at Publisher*

Othman, R. and R. Ameer, 2009. Market risk disclosure: Evidence from Malaysia listed firms. Journal of Financial Regulation and Compliance, 17(1): 57-69. *View at Google Scholar | View at Publisher*

Patel, S.A. and G. Dallas, 2002. Transparency and disclosure: Overview of methodology and dtudy results-United States. Retrieved from http://papers.ssrn.com/sol3/results.cfm?RequestTimeout [Accessed 26 May, 2016].

Poskitt, R., 2005. Disclosure regulation and information risk. Accounting and Finance, 45(3): 457-477. *View at Google Scholar | View at Publisher*

Richard, E., M. Chijoriga, E. Kaijage, C. Peterson and H. Bohman, 2008. Credit risk management system of a commercial bank in Tanzania. International Journal of Emerging Markets, 3(3): 323-332. *View at Google Scholar | View at Publisher*

Rime, B., 2001. Capital requirements and bank behavior: Empirical evidence for Switzerland. Journal of Banking and Finance, 25(4): 789-805. *View at Google Scholar | View at Publisher*

Shleifer, A. and R. Vishny, 1986. Large shareholder and corporate control. Journal of Political Economy, 94(3): 461-464. *View at Google Scholar*

Shrieves, R.E. and D. Dahl, 1992. The relationship between risk and capital in commercial banks. Journal of Banking and Finance, 16(2): 439-457. *View at Google Scholar | View at Publisher*

Solomon, T., 2005. Banking fragility and disclosure: International evidence. William Davidson Institute Working Papers Series wp748, William Davidson Institute at the University of Michigan.

Wintoki, M.B., J.S. Linck and J.M. Netter, 2012. Endogeneity and the dynamics of internal corporate governance. Journal of Financial Economics, 105(3): 581-606. *View at Google Scholar | View at Publisher*

Woods, M., K. Dowd and C. Humphrey, 2008. The value of risk reporting: A critical analysis of value-at-risk disclosures in the banking sector. International Journal of Financial Services Management, 3(1): 45-64. *View at Google Scholar | View at Publisher*

Wooldridge, J.M., 2006. Introductory econometrics: A modern approach. 3rd Edn., Mason, Ohio: South-Western Cengage Learning.

Zhang, J., C. Jiang, B. Qu and P. Wang, 2013. Market concentration, risk-taking, and bank performance: Evidence from emerging economies. International Review of Financial Analysis, 30(c): 149-157. *View at Google Scholar | View at Publisher*

Appendix-1. Composite disclosure index

The transparent bank disclosure index is constructed referring (Nier and Baumann, 2006) who identified 17 items in four (4) categories: Assets, Liabilities, Memo lines and Income statement. They assign values corresponding to each item: either "1" for disclosure or "0" for non-disclosure. They separately assign value to three items (S6, S7 and S13): "0" for non-disclosure, "1"for the total amount mentioned and "2" for a detailed breakdown. Additionally, they infer another situation based on these three (3) items, in which "1" is assigned for detailed breakdown of the three and "0" for otherwise. Summarizing the seventeen (17) sub-indices, they calculate the composite index as follows:

$$Bank\ Disclosures\ Index\ (BDI) = \frac{1}{21}\sum_{i=1}^{17} S_i$$

Bank Disclosure indices		
	Sub-index	**Categories**
Assets		
Loans	s1: Loans by maturity	Less than three months, three to six months, six months to one year, one to five years, more than five years
	s2: Loans by type	Loans to municipalities/government, mortgages, HP/lease, other loans
	s3: Loans by counterparty	Loans to group companies, loans to other corporate, loans to banks
	s4: Problem loans	Total problem loans
	s5: Problem loans by type	Overdue/restructured/other non-performing
Other earning assets	s6: Securities by type	Detailed breakdown: Treasury bills, other bills, bonds, CDs, equity investments, other investments
	s7: Securities by holding purpose	Coarse breakdown: Government securities, other listed securities, non-listed securities, Investment securities, trading securities
Liabilities		
Deposits	s8: Deposits by maturity	Demand, savings, less than three months, three to six months, six months to one year, one to five years, more than five years
	s9: Deposit by type of customer	Banks deposits, municipal/government, other funding
	s10: Money market funding	Total money market funding
	s11: Long-term funding	Convertible bonds, mortgage bonds, other bonds, subordinated debt, hybrid capital
Memo lines		
	s12: Reserves	Loan loss reserves (memo)
	s13: Capital	Total capital ratio, tier 1 ratio, total capital, tier 1 capital
	s14: Contingent liabilities	Total contingent liabilities
	s15: Off-balance sheet items	Off-balance sheet items
Income statement		
	s16: Non-interest income	Net commission income, net fee income, net trading income
	s17: Loan loss provisions	Loan loss provisions

*The categories chosen reflect the presentation in the annual report.