

ROLE OF COMMITTEES IN BANK VALUATION: EVIDENCE FROM AN EMERGING MARKET

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ABSTRACT

The purpose of this study is to examine the effect of corporate governance mechanisms on bank performance in general and the effect of board-constituted committees on bank performance in particular. Primarily, two questions are addressed in the context of the banking sector of India. First, does corporate governance mechanisms reduce the quantum of non-performing assets (NPAs)? Second, does the internal committee affect bank performance? Hence, this paper determines whether independent directors strengthen corporate boards and whether committees affect bank performance. The panel data ordinary least square regression analysis is used for this study. We also use logistic regression models for various committees to find their relationship with bank performance and NPAs. Tobin's Q is used as proxy for bank performance. Independent variables are board size (BSIZE), proportion of independent directors on the board (PERIND), number of board meetings per year (BMEET), size of the audit committee (AUC), and two measures of the bank business (asset size and loan), and one control variable is time. We use financial and corporate governance data from 2005 to 2018, the study finds that independent directors play a major role on the board. It finds a positive and significant relationship between board independence and bank performance. The performance also increases with the increase in board size but after a point, the curve declines forming an inverted U-shaped curve is formed. The mandatory internal committees have a crucial role to play, which is demonstrated by their effect on the reduction of NPAs. The significance of a well-functioning board and internal committees in discharging their fiduciary duties is highlighted in this study. An internal committee comprising a majority of independent

directors is found to positively affect the performance of banks. They can help managers disburse good-quality loans and keep a check on risk-laden ventures.

Keywords: corporate governance, board of directors, audit committee, non-performing asset committee, bank performance

INTRODUCTION

Several studies have suggested that a well-functioning banking system spurs economic growth (Levine et al., 2000; Claessens & Laeven, 2003), particularly in economies where capital markets are not well developed. An underdeveloped capital market causes commercial enterprises to have a limited access to inexpensive funds. Banks serve as an intermediary between lenders and borrowers in such a financial setup. Efficient mobilisation and allocation of funds by banks reduce the cost of capital to banks and firms, thus accelerating capital accumulation and productivity and effectively resulting in economic growth. Moreover, effective application of sound governance mechanisms leads to inexpensive raising of capital, efficient allocation of society's savings, and exertion of sound governance over firms they fund (Caprio et al., 2007). Andres and Vallelado (2008) indicated that good corporate governance is essential for operating a sound financial system and improving the country's economic development. However, high-profile businesses, such as Lehman Brothers, Enron Corp., WorldCom Inc., Global Crossing Ltd., and Satyam Computer Ltd., have failed globally. These corporate mismanagements jolted investors' confidence and attracted the attention of regulators and other stakeholders alike. Such incidents have eroded the public confidence in corporate governance structures and raised a question regarding the ability of corporate boards and various committees to monitor and control management's behaviour.

A substantial amount of the literature is available on corporate governance but very few have focused on corporate governance in banks (e.g., Adams & Mehran, 2005; Andres & Vallelado, 2008; Caprio et al., 2007; Levine, 2004; Macey & O'Hara, 2003). The vital characteristics of corporate governance can be applied to the banking system too. The banking sector is one of the most regulated sectors. Hence, banks have to mandatorily abide by the prescribed regulatory requirements. According to Levine (2004), board members play a vital role in governance.

Opacity exists in banks' lending process where the role of the board becomes more important because other small stakeholders would be incapable of enforcing effective governance themselves. The governance mechanism plays a crucial role in mitigating opportunistic and unlawful activities. To make governance systems

more robust in order to be able to encounter challenges, various measures and regulations have been implemented from time to time by regulators, taking cues from various reports by corporate governance committees worldwide. The governance mechanism codes differ from country to country. In India, corporate governance mechanisms were introduced through Clause 49,¹ which borrowed heavily from the report of the Cadbury committee. Apart from the board of directors, companies also constitute other types of committees to measure internal controls.

One such important committee is the audit committee (AUC), which plays an essential role in monitoring internal controls. Furthermore, the board of directors additionally oversee internal controls as part of their fiduciary duties. Regulators reduce systemic risk that may arise from conflict with the main goal of shareholders.

Non-Performing Assets and Gross Non-Performing Assets of Indian Banks

The Indian economy and banking industry witnessed a drastic change after the implementation of financial reforms in the 1990s. The Reserve Bank of India² (RBI) introduced several reforms such as the deregulation of interest rates, reduction of reserve requirements, strengthening of bank supervision, introduced prudential norms, and improved the competitiveness of the banking system through the entry of private banks (Narasimham, 1991). During the 1990s, the Indian banking industry grew tremendously (i.e., effective mobilisation of deposits).

The second Narasimham Committee Report (1998) stressed on two features of banking regulation, namely the capital adequacy ratio, asset classification and resolution of non-performing assets (NPAs) and gross non-performing assets (GNPAs). The RBI introduced various measures for the early identification of asset quality problems, timely restructuring of debt, and recovery of loans. In addition, the RBI introduced Basel III norms of the minimum capital requirements to improve the overall health and strength of the Indian banking industry. The NPA and GNPA levels of the Indian banking system marginally decreased from 2005 to 2011 but substantially increased after 2011. A significant increase in NPAs and GNPAs and a decline in the return on assets (ROA) in the Indian banking industry created major challenges not only for the regulator and Indian government but also for other stakeholders because of huge capital losses experienced by banks. However, the regulator encounters numerous challenges from political parties, businesses, and economic interest groups in handling various concerns and issues.³ Tripathi and Brahmaiah (2018) documented that NPAs and GNPAs negatively affect the bank performance (see Figures 1 and 2). In view of these developments and the lack of studies on the NPAs of Indian banking institutions, corporate governance mechanisms, and the effect of internal committees on bank performance, we intend to explore this topic.

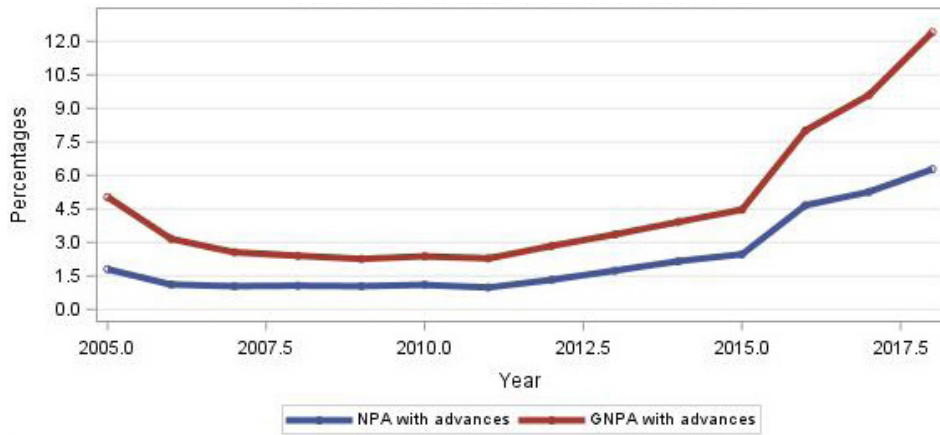


Figure 1. Percentages of NPAs and GNPA with total advances

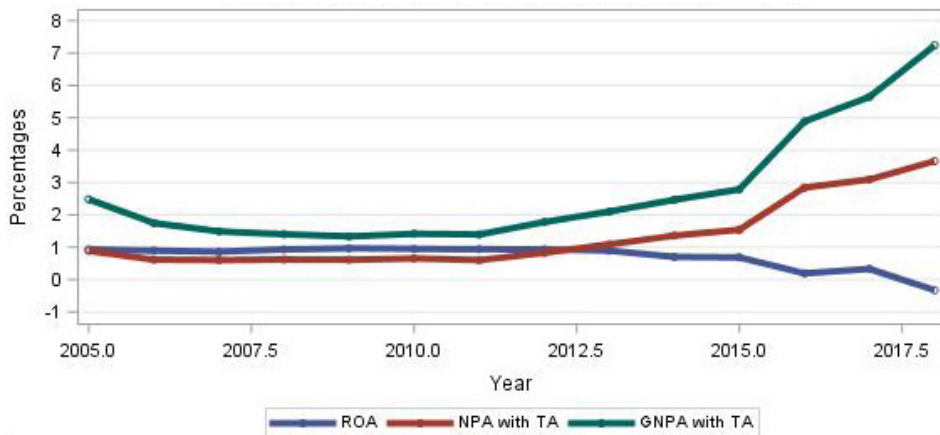


Figure 2. Percentages of NPAs and GNPA with total advances and ROA

This paper contributes by extending the literature on bank board governance in a major emerging economy. Most of the extant studies have focused on developed economies and indicated a significant role of corporate governance in the banking performance (Adams et al., 2010; Adams & Mehran, 2012; Denis & McConnell, 2003; Levine, 2004; Macey & O'Hara, 2003). The mechanism and effectiveness of bank governance in India is considerably different from those in other economies. The difference is mainly due to the fact that India is an emerging economy and is witnessing the implementation of several regulations after the economy opened in the early 1990s. Finally, this paper provides new evidence on the effect of various internal committees on bank performance and NPAs in India.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The board of directors monitor the management on behalf of the shareholders where it oversees the approval of major business decisions and corporate strategies such as disposal of assets, investments, or acquisitions, and tender offers made by acquirers. The board is also in charge of executive compensation, risk management and audits. Boards operate through committees such as compensation, nominating, and audit committees (Tirole, 2010; Zingales, 1998). However, the boards of banks are different from the boards of non-financial firms. De Andres et al. (2012) indicated that boards in the banking sector are bigger and more independent than those in the non-financial sector. Furthermore, boards in the banking sector are accountable to all stakeholders and are liable to respond to all regulators on crises or unlawful activities because individual bank failures can exert a cascading effect on other related banks.

In the banking industry, major complexities occur due to the quality of loans that cannot be evidently observed, intricate financial statements that are not produced with transparency, and accessibility of significant information travelling only between managers and insiders (James & Joseph, 2008; Alexander et al., 2013). From a cross-country perspective, studies on NPAs have focused on several useful perspectives. Researchers have investigated the relationship between bank performance and NPAs and have found that banks' profitability and efficiency are negatively associated with NPAs (Berger & DeYoung, 1997; Podpiera & Weill, 2008). Some studies have documented that higher credit growth also leads to NPAs (Hess et al., 2009; Keeton, 1999; Salas & Saurina, 2002). In the same direction, Louzis et al. (2012) reported a negative relationship between NPAs and profitability. They also found that well-capitalised banks have lower NPA issues; however, these banks maintain a low credit risk level at the time of extending loans to borrowers (Bhatia et al., 2012; Gonzalez-Hermosillo et al., 1997).

The bank's efficiency and management have a significant effect on the NPAs of the banks (Breuer, 2006; Drake & Hall, 2003). The extant literature has showed a negative relationship between the cost to income ratio, credit to deposit ratio, and loans to expense ratio with NPAs (Hanweck, 1977; Karim et al., 2010; Kwan, 2006; Pantalone & Platt, 1987).

Other researchers investigating the relationship between loan growth and NPAs have shown that banks with a high loan growth rate had higher NPAs. Therefore, high and liberal credit growth led to higher NPAs in banks (Borio et al., 2001; Clair, 1992; Hess et al., 2009). The high NPA level adversely affects not only banks' efficiency and loan growth but also the banks' capital. Therefore, banks

with higher capital are less inclined to undertake excess credit risk because the higher level of capital can result in higher loss absorption capacity and a lower level of NPA (Das & Ghosh, 2005; Greenidge & Grosvenor, 2010; Rajaraman et al., 1999).

Meacci (1996) examined the NPAs of various banks of Italy and reported that an increase in the riskiness of loan assets is rooted in a bank's lending policy, attributing to the relatively unselective and inadequate assessment of sectoral prospects. Muniappan (2002) concluded that the problem of NPAs is related to several internal and external factors confronting borrowers. Ranjan and Dhal (2003) reported that the probability of default decreases during favourable macroeconomic conditions because borrowers want to maintain their credit worthiness. Banks' lending policy can exert a crucial effect on NPAs (Reddy, 2004). The literature shows a negative relationship between NPAs and banks' profitability and between bank size and NPAs (Thiagarajan et al., 2011). In the same direction, Kent and D'Arcy (2000) examined the cyclical lending performances of banks in Australia and argued that the banks experience substantial losses on their advances, which increase during the peak of the expansion phase of the economy. Although the risk inherent in banks' lending portfolios peaks at the top of the cycle, this jeopardy inclines to be realised during the shrinkage phase of the business cycle during which an increase in banks' NPAs negatively affects their profits.

Board Size and Bank Performance

The role of the board of directors for the soundness and safety of the banking system through the Basel Committee on Banking Supervision (2006) is well established globally. In the Indian context, it is described in Clause 49 listing agreements. Good governance by the board provides benefits through greater access to financing and reduces the cost of capital (Adams & Mehran, 2012; Liang et al., 2013; Claessens & Yurtoglu, 2013). Germain et al. (2014) reported that bigger boards can delegate more human resources to supervise and advise on managers' decision, in line with the resource-based theory. However, a large board size is ineffective due to coordination issues, and it also has free riding concerns. Some of the studies have indicated a negative relationship between board size and bank performance (Hermalin & Weisbach, 2001; Liang et al., 2013; Rowe et al., 2011; Yermack 1996). To control adverse situations, firms pay high coordination costs, leading to a negative effect on bank performance (James & Joseph, 2015). Accordingly, we hypothesise the presence of a negative relationship between board size and bank performance.

H1: Board size impacts bank performance.

Board Independence and Bank Performance

Harris and Raviv (2008) asserted that independent directors possess the knowledge and abilities to monitor, discipline, and advise managers, thus enabling the directors to resolve conflicts of interest between insiders and shareholders. Likewise, Andres and Vallelado (2008) reported that the balance between executive and non-executive directors can result in efficient advising without overlooking the monitoring function, less conflict of interest when monitoring managers, and a positive relationship between non-executive directors and bank performance. Berger and Bowman (2013) also reported that independent directors can facilitate information exchange because they have the advantage of accessing other firm's privately owned data, which can help in unravelling favourable prospects for the bank. The outside knowledge and better experience of independent directors on the board create unique resources for the bank, leading to a positive relationship between board independence and bank performance. Therefore, we hypothesise that greater board independence enables its members to take prudent decisions and also compensates management according to their performance.

H2: Board independence positively impacts bank performance.

Board Meetings and Bank Performance

An empirical study on the relationship between bank value and board composition would be inadequate if it does not consider the internal functioning of the board. Several factors can affect the functioning of boards. In particular, one of the causes is the frequency of board meetings (Vafeas, 1999). The author indicated that board meetings are an important source through which the board of directors deliver their duties and plan future strategies that can lead to the enhanced performance of firms (Vafeas, 1999). The activity of the board and the frequency of board meetings are a measure of the power and efficacy of the board of directors (Conger et al., 1998; Lipton & Lorsch, 1992). Board activities through regular meetings help to appraise managers and are also an important platform to address any arising issue in a timely and effective manner (Vafeas, 1999). A positive relationship was found between board meetings and firm performance (Mangena et al., 2012). In contrast to that, a negative association was found between board meetings and firm performance (Andres & Vallelado, 2008; El Mehdi, 2007). Overall, the extant literature is inconsistent with regard to the effect of board meetings on firm performance. We hypothesise that more board meetings indicate more discussion and implementation of companies' operations and strategies.

H3: Board meetings positively impacts bank performance.

NPAs and Bank Performance

Bank NPAs and performance are inversely related to each other (Berger & De Young, 1997; Podpiera & Weill, 2008; Tripathi & Brahmaiah, 2018). Louzis et al. (2012) also found a negative relationship between NPAs and profitability and reported that well-capitalised banks have lower NPA issues. The bank's management exert a significant effect on the NPAs of banks (Breuer, 2006; Drake & Hall, 2003). Hence, we hypothesise (alternate hypotheses) the following:

H4: Audit committee negatively impacts bank performance.

H5: NPA committee positively impacts bank performance.

H6: Risk management committee positively impacts bank performance.

Corporate Governance, Committees and NPAs

When a firm engages itself in excessive risky projects, it might likely lead to negative results. Diamond and Rajan (2009) documented that banks with high-quality corporate governance introduce appropriate incentives and controls to align the risk-taking practices of the banks to increase shareholder value. The corporate governance mechanism of banks is essential because banks play a crucial role in the mobilisation and allocation of capital and growth. Hence, when banks implement good governance structures, bank managers allocate capital efficiently and improve market conditions (Levine, 2004). Banks with better governance make effective decisions that can reduce losses due to bad loans (Graham & Narasimhan, 2004). Furthermore, the ineffective corporate governance of a firm negatively affects the entire financial system directly and indirectly. Therefore, risky projects of banks have different effects on markets compared to risky projects of non-financial firms. Tarchouna et al. (2017) reported that poorly governed banks with governance proxies are positively related to NPAs. They asserted that when banks have excessive liquidity, they invest in risky projects. To test the following hypothesis, we consider total NPAs, board size, board independence, AUC, NPA committee (NPAC), and risk management committee (RSKC). Hence, we hypothesise (alternate hypotheses) the following:

H7: Audit committee inversely impacts the quantum of NPA.

H8: NPA committee inversely impacts the quantum of NPA.

H9: Risk management committee inversely impacts the quantum of NPA.

METHODOLOGY

Panel data allows analysing bank performance when the sample is a mix of cross-sectional and time series data. Incorporating the temporal dimension of the data enhances the accuracy of results in the study. The panel data structure permits to consider the constant and unobservable heterogeneity, which is an explicit construct of each bank (such as management style and quality and business strategy). The pooled ordinary least squares (OLS) estimations produce estimators that are biased and inconsistent when the unobserved effect is correlated among independent variables. This issue of the econometric challenge can be eliminated with the use of the first differences or the fixed effects (within) estimators. However, Hermalin and Weisbach (2003) reported that it is rational to consider that the board creates endogeneity problems. Hence, it is mandatory to use an econometric method that can deal with endogeneity issues along with the existence of unobservable fixed effects, which are connected with each bank.

Dependent variables are Tobin's Q (TBQ) as proxy for bank valuation and asset quality (NPAs). Independent variables are board size (BOD), proportion of independent directors on the board (PERIND), number of board meetings per year (BMEET), size of audit committee (AUC), and two measures of the bank business (asset size and loan) and controlled for time.

When panel data are used in the empirical study, it must consider both the individual represented by the sub index i and the time point represented by t . Additionally, the error term is decomposed into two parts: the combined effect ($\mu_{i,t}$), which varies between individuals and time periods, and the individual effect (η_i), which is a characteristic of each individual (bank). This term varies among individuals but is constant over time. The regression models (Equations 1–4) are used to test the hypotheses with a non-linear relationship for corporate governance proxies and other bank attributes.

$$TBQ_{i,t} = \alpha + \varphi_1 BOD_{i,t} + \varphi_2 BODSQ_{i,t} + \varphi_3 PERIND_{i,t} + \varphi_4 BMEET_{i,t} + \varphi_5 LNTA_{i,t} + \varphi_6 LOAN_{i,t} + \varphi_7 GNPAT_{i,t} + \eta_i + \mu_{i,t} \quad (1)$$

$$GNPAT_{i,t} = \alpha + \alpha_1 BOD_{i,t} + \alpha_2 BODSQ_{i,t} + \alpha_3 PERIND_{i,t} + \alpha_4 BMEET_{i,t} + \alpha_5 LNTA_{i,t} + \alpha_6 LOAN_{i,t} + \eta_i + \mu_{i,t} \quad (2)$$

$$TBQ_{i,t} = \alpha + \varphi_1 AUC_{i,t} + \varphi_2 PERAUIND_{i,t} + \varphi_3 LNTA_{i,t} + \varphi_4 LOAN_{i,t} + \varphi_5 GNPAT_{i,t} + \eta_i + \mu_{i,t} \quad (3)$$

$$\text{GNPARAT}_{i,t} = \alpha + \alpha_1 \text{AUC}_{i,t} + \alpha_2 \text{PERAUIND}_{i,t} + \alpha_3 \text{LNTA}_{i,t} + \alpha_4 \text{LOAN}_{i,t} + \eta_i + \mu_{i,t} \quad (4)$$

The regression models (Equations 5–6) use dummy variables for the establishment of various committees because some banks have established that particular committee, whereas others have not.

$$\text{TBQ}_{i,t} = \pm + \varphi_1 (\text{NPACD or RSKCD})_{i,t} + \varphi_2 \text{GNPARAT}_{i,t} + \varphi_3 \text{LNTA}_{i,t} + \varphi_4 \text{LOAN}_{i,t} + \eta_i + \mu_{i,t} \quad (5)$$

$$\text{GNPARAT}_{i,t} = \pm + \alpha_1 (\text{NPACD or RSKCD})_{i,t} + \alpha_2 \text{NPA}_{i,t} + \alpha_3 \text{LNTA}_{i,t} + \alpha_4 \text{LOAN}_{i,t} + \eta_i + \mu_{i,t} \quad (6)$$

When the strict exogeneity condition fails, then both the first differences and fixed effects (within) are unpredictable and have different probability limits. The general approach for estimating models that do not satisfy the strict exogeneity is to use transformation to eliminate unobserved effects and instruments to deal with endogeneity (Wooldridge, 2002). Thus, the aforementioned models are empirically estimated by applying the generalised method of moments (GMM) estimator proposed by Arellano and Bond (1991). The GMM approach can control for endogeneity problems that may appear in the models. Although endogeneity problems can also be controlled by using simultaneous equation estimators, such as the maximum likelihood and two- or three-stage least squares estimators, the choice is based on consistency concerns (De Miguel et al., 2005). This is because the aforementioned estimators are more efficient than GMM and they are not consistent, and thus, generating biased results because they do not eliminate unobservable heterogeneity firms' specificity that gives rise to a particular behaviour. These differences between individuals (banks in this case) are potentially correlated with explanatory variables (also called individual specific effects), invariant over time, and they thus directly influence corporate decisions (entrepreneurial capacity, corporate culture, etc.).

Data Collection

The financial data and corporate governance information are extracted from the Prowess database (a comprehensive database on Indian companies maintained by the Centre for Monitoring Indian Economy) and banks' annual reports for the financial years 2005–2018. We obtain data on the board independence, BOD, AUC, NPAC, RSKC, IT strategy committee, and credit approval committee as well as the sundry financial data of commercial banks. The establishment of an AUC is

mandatory for all banks but that of other committees is discretionary. We obtain 100%, 29.4%, 80.80%, 53.10%, and 26.90% firm-year data for the AUC, NPAC, RSKC, IT strategy committee, and credit approval committee, respectively.

We build an unbalanced panel of data with 480 bank-year observations. The bank-year observations in the sample are for all public and private listed banks on the National Stock Exchange in India. The variables for this study are constructed from the existing works in the literature (Hermalin & Weisbach, 1991; Yermack, 1996; Fernandez & Weinberg, 1997; Vafeas, 1999; Bhagat & Black, 2002; DeZoort et al., 2002; Anderson, 2004; Adams & Mehran, 2005; Caprio et al., 2007; Andres, 2008; Andres & Vallelado, 2008; Adams & Ferreira, 2008; Tarchouna et al., 2017; Ciftci et al., 2019).

Variable Construction

The construction of the variables used for the study are explained as follows:

Tobin's Q: Bank value is measured using Tobin's Q (TBQ). TBQ is the ratio of market to book value. It is computed as the sum of market capitalisation and book value of debt over total assets. Previous studies (Adams & Mehran, 2005; Andres & Vallelado, 2008; Bhagat & Black, 2002; Caprio et al., 2007; Fernandez & Weinberg, 1997; Hermalin & Weisbach, 1991; Yermack, 1996) have used TBQ.

PERIND: The measure of independent directors on the board is taken as the ratio of number of independent directors to that of the total size of the board.

AUC: The measure of the size of audit committee is the number of members on the audit committee.

BMEET: The number of board meetings conducted during the year as a proxy for the functioning of the boards of directors.

NPAC: The non-performing asset committee is a dummy variable that takes a value 1 if it is present in the company and 0 otherwise.

RSKC: The risk management committee is a dummy variable that takes a value 1 if it is present in the company and 0 otherwise.

IT Strategy: The IT strategy committee is a dummy variable that takes a value 1 if it is present in the company and 0 otherwise.

Credit Approval Committee: The credit approval committee is a dummy variable that takes a value 1 if it is present in the company and 0 otherwise.

LNTA: The size of banks is considered as the total assets of banks (natural logarithms of total assets, LNTA).

LOAN: The magnitude of loan disbursement by the bank is calculated by the proportion of loans to total assets.

ROA: The return on assets (ROA) is used as a measure of bank performance to test the analysis. ROA is calculated as the profit after tax divided by total assets. Table 1 shows the descriptive statistics of all the variables of this study.

Table 1
Descriptive statistics

	Mean	Maximum	Minimum	Std. dev.
TBQ	1.002	1.776	0.910	0.117
ROA	0.007	0.018	-0.025	0.007
RETQTR	0.050	0.654	-0.302	0.128
GNPA	0.045	0.324	0.001	0.047
BOM	13.458	22.000	4.000	3.157
PERIND	0.432	0.929	0.000	0.266
AUC	5.462	8.000	2.000	2.244
PERAUIND	0.596	1.000	0.300	0.286
BMEET	5.213	10.000	2.000	1.304
LNTA	13.798	17.358	10.183	1.304
LOAN	0.598	0.705	0.397	0.051
NPACD	0.294	1.000	0.000	0.456
RSKCD	0.808	1.000	0.000	0.394

Note: TBQ = Tobin's Q; ROA = return on assets; GNPA = gross non-performing assets divided by total assets; BOM = number of board members on the board; PERIND = proportion of independent directors on the board; AUC = audit committee members; PERAUIND = proportion of independent directors on audit committee; BMEET = board meetings conducted during the year; LNTA = natural logarithm of total assets of bank; LOAN = total loan amount given divided by total assets; NPACD and RSKCD = dummy variables for establishment of non-performing assets committee and risk management committee. This descriptive statistic is for unbalanced panel data and bank-year is 480.

RESULTS

Board Characteristic and Bank Performance

The average TBQ ratio is > 1 , the average ROA is 0.7%, and the average NPA is 4.5% of total advances. The average board size is 13.46 directors, higher than average board size of 12 directors for non-financial firms (Rosenstein & Wyatt, 1997; Klein, 1998; Vafeas, 1999; Andres et al., 2005; Yermack, 1996;) but less than 17 directors reported by Adams and Mehran (2005) in their study for the period of 1995–1999 for financial institutions. PERIND is an average of 43.2%, which is less than that reported by Adams and Mehran (2005) and Andres and Vallelado (2008).

The AUC is mandatory for all banks according to Clause 49 of the listing agreement; the average size of AUC is 6.59 directors. The average number of board meeting is 5.22, which is lower than the average of 8.48 reported by Adams and Mehran (2005) and 10.45 reported by Andres and Vallelado (2008). We find 29.4% firm-year for the NPAC and 80.80% firm-year for RSKC.

Models I and II of Table 2 shows GMM estimators where dependent variable is TBQ. We find that the F test of model is statistically significant at 1% level, and the statistical test does not reject the validity of our model. The variance inflating factor (VIF)⁴ for each coefficient is < 3 , which indicates that the model is free from multicollinearity⁵ problems. The adjusted r^2 ranges from 0.1149 to 0.2396. We find negative coefficients for PERIND in Models I and II, and both the coefficients are significant at 1% level.

Table 2
Board characteristics, AUC and value creation: GMM estimations

Variables	Models							
	TBQ		GNPARAT		TBQ		GNPARAT	
	I	II	III	IV	V	VI	VII	VIII
BOM	0.060 ^a (28.16)	0.060 ^a (23.99)	-0.014 ^a (-14.6)	-0.006 ^a (-5.55)	n.a.	n.a.	n.a.	n.a.
BOMSQ	-0.002 ^a (-24.73)	-0.002 ^a (-21.65)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
PERIND	-0.102 ^a (-5.35)	-0.128 ^a (-4.77)	-0.200 ^a (-7.47)	-0.211 ^a (-4.94)	n.a.	n.a.	n.a.	n.a.
BMEET	0.003 ^a (1.85)	0.004 ^b (2.24)	0.013 ^a (9.12)	0.006 ^a (3.19)	n.a.	n.a.	n.a.	n.a.

(Continued on next page)

Table 2 (Continued)

Variables	Models							
	TBQ		GNPARAT		TBQ		GNPARAT	
	I	II	III	IV	V	VI	VII	VIII
AUC	n.a.	n.a.	n.a.	n.a.	-0.007 ^a (-16.19)	-0.007 ^a (-14.44)	-0.017 ^a (-20.85)	-0.007 ^a (-10.06)
PERAUIND	n.a.	n.a.	n.a.	n.a.	-0.105 ^a (-10.1)	-0.107 ^a (-9.69)	-0.111 ^a (-4.74)	-0.154 ^a (-13.63)
LNTA	0.044 ^a (17.6)	0.051 ^a (12.1)	0.045 ^a (13.77)	0.081 ^a (16.75)	0.052 ^a (56.98)	0.057 ^a (21.05)	0.056 ^a (11.36)	0.083 ^a (24.71)
LOAN	n.a.	-0.143 ^b (-2.31)	n.a.	-1.257 ^a (-21.7)	n.a.	-0.115 ^b (-2.05)	n.a.	-1.266 ^a (-36.8)
GNPARAT	-0.245 ^a (-7.14)	-0.322 ^a (-6.79)	n.a.	n.a.	-0.311 ^a (-11.93)	-0.371 ^a (-8.1)	n.a.	n.a.
F-Value	17.83 ^a	15.37 ^a	14.89 ^a	26.16 ^a	31.56 ^a	25.23 ^a	16.54 ^a	30.17 ^a
R-sq	0.1494	0.1525	0.1264	0.2396	0.2033	0.2019	0.1149	0.2334
Hausman χ^2 (<i>p</i> -value)	18.32 ^a (0.0025)	19.33 ^a (0.0036)	9.74 ^c (0.0828)	24.3 ^a (0.0005)	14.36 ^a (0.0062)	15.56 ^a (0.0082)	12.01 ^a (0.0053)	24.94 ^a (< 0.0001)
Sargan χ^2	0.2431	0.2471	28.58	24.82	31.95	31.82	28.34	29.11
AR(1) test	-1.99 (0.047)	-1.98 (0.048)	-1.06 (0.289)	-1.51 (0.130)	-1.89 ^c (0.058)	-1.86 (0.063)	-2.07 ^b (0.038)	-1.34 (0.181)
AR(2) test	-0.89 (0.376)	-1.03 (0.305)	-0.22 (0.823)	-0.08 (0.938)	-0.87 (0.382)	-1.03 (0.30)	0.87 (0.381)	-1.24 (0.217)
Bank-year	352	352	352	352	352	352	352	352
Types of data	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance

Note: The table reports the GMM estimations. The dependent variable is TBQ and gross non-performing assets ratio (GNPARAT). The *t*-values of coefficient significance are in brackets. Statistically significant at 1%^(a), 5%^(b) and 10%^(c).

Table 3 shows the empirical relationship between RSKC and TBQ (Models V and VI). The data shows 80.8% bank-years for RSKC out of a total of 480 bank-years. Examining the effect of RSKC on bank performance and GNPARAT, we find the coefficients are positive and statistically significant at 1% level. Models VII and VIII exhibit linkage between RSKCD and NPARAT. The coefficients of RSKCD in both models are negatively related with GNPARAT. All the coefficients are statistically significant at the 1% level.

Table 3
*Non-performing assets committee and risk management committee and value creation:
 GMM estimations*

	Models							
	TBQ		GNPARAT		TBQ		GNPARAT	
NPACD	-0.048 ^a (-17.31)	-0.047 ^a (-7.19)	-0.041 ^a (-36.39)	-0.019 ^a (-6.43)	n.a.	n.a.	n.a.	n.a.
NPADINT	-0.124 (-1.34)	-0.247 ^c (-1.81)	1.143 ^a (68.14)	0.741 ^a (49.59)	n.a.	n.a.	n.a.	n.a.
RSKCD	n.a.	n.a.	n.a.	n.a.	0.041 ^a (16.83)	0.0362 ^a (23.38)	-0.098 ^a (-187.41)	-0.094 ^a (-45.83)
RSKCDINT	n.a.	n.a.	n.a.	n.a.	-0.078 (-0.91)	0.0468 ^a (43.46)	1.085 ^a (404.45)	0.997 ^a (135.75)
LNTA	0.071 ^a (32.97)	0.062 ^a (24.45)	0.023 ^a (27.92)	0.043 ^a (27.97)	0.045 ^a (44.25)	-0.0012 (-0.05)	0.004 ^a (24.02)	0.010 ^a (10.14)
LOAN	n.a.	0.202 ^a (4.45)	n.a.	-0.609 ^a (-39.23)	n.a.	-0.2641 ^a (-8.22)	n.a.	-0.118 ^a (-10.14)
GNPARAT	-0.038 (-0.65)	0.163 ^c (1.95)	n.a.	n.a.	-0.182 ^a (-2.78)	0.0362 ^a (23.38)	n.a.	n.a.
F-Value	8.01 ^a	7.98 ^a	191.57 ^a	163.71 ^a	15.44 ^a	14.13 ^a	828.71 ^a	633.88 ^a
R-sq	0.055	0.068	0.544	0.576	0.1076	0.1206	0.8383	0.8409
Hausman χ^2 (<i>p</i> -value)	12.80 ^b (0.0147)	15.71 ^a (0.0017)	3.37 (0.339)	16.60 ^a (0.0023)	17.17 ^a (0.0018)	20.52 ^a (0.004)	9.69 ^b (0.0214)	17.50 ^a (0.0015)
R-sq with	0.843	0.842	0.643	0.709	0.8413	0.8418	0.8667	0.8796
R-sqbetw	0.32	0.398	0.492	0.506	0.3585	0.4939	0.8972	0.8982
R-sq overall	0.024	0.029	0.558	0.629	0.0215	0.0241	0.8376	0.8481
Sargan χ^2	30.15	31.22	30.5	27.16	31.57	31.76	30.89	28.06
AR(1) test	-1.75 ^c (0.081)	-1.88 ^c (0.06)	0.66 (0.509)	-1.2 (0.232)	-1.48 (0.138)	-1.49 (0.135)	-1.75 ^c (0.081)	-1.85 ^c (0.064)
AR(2) test	-1.63 (0.103)	-1.54 (0.12)	-0.75 (0.453)	-0.45 (0.650)	-0.45 (0.651)	-0.52 (0.602)	-0.82 (0.412)	-0.9 (0.365)
Bank-year	352	352	352	352	352	352	352	352
Types of data	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance

Note: The table reports the GMM estimations. The dependent variable is TBQ and GNPARAT. The *t*-values of coefficient significance are in brackets. Statistically significant at 1%^(a), 5%^(b) and 10%^(c).

DISCUSSION

Table 2 lists the empirical findings of GMM estimations for the dependent variable TBQ and GNPART. To control potential endogeneity problems with board characteristics, GMM estimation is developed by Hansen (1982) and White (1982). The GMM with adjusted standard errors take into account the unobservable heterogeneity, transforming original variables into first differences and the endogeneity of independent variables by using instruments. In GMM, one way to alleviate the bias caused by endogenous variables is to use instrumental variables (variables that can also predict the endogenous variable but themselves are not endogenous).

Models I and II of Table 2 show GMM estimators where dependent variable is TBQ. We find no serial correlation in residuals by performing the first and second order correlation tests (AR1 and AR2, respectively) and confirm both the absence of the second order serial correlation and the validity of instruments used to avoid the endogeneity problem.

We find a positive and statistically significant relationship between BOD and TBQ; this finding is in line with those of previous studies (Dalton et al., 1999; Lipton & Lorsch, 1992; Singh et al., 2018; Veprauskaite & Adams, 2013). However, we find a negative and statistically significant relationship between BODSQ (square of board size) and TBQ. This result demonstrates a non-linear relationship between BOD and TBQ. Our empirical findings confirm the hypothesised inverted U-shaped relationship between BOD and TBQ (Figure 3). Adams and Mehran (2005) indicate that the addition of new directors may positively affect bank performance, although the rise in performance shows a diminishing marginal growth. Therefore, the negative and significant coefficient of BODSQ (square of board meetings) indicates that there is a point after which adding a new director reduces bank value. For banks in the sample, this value of board size is between 9 and 17 directors.

We find negative coefficients for PERIND in Models I and II, and both the coefficients are significant at 1% level. This finding indicates that a high proportion of independent directors may not increase bank performance. A negative relationship between PERIND and bank performance has been reported by several researchers (Beasley, 1996; Fosberg, 1989; Grace et al., 1995; Hermalin & Weisbach, 1991; Molz, 1988; Vafeas, 2000) (see Figure 4).

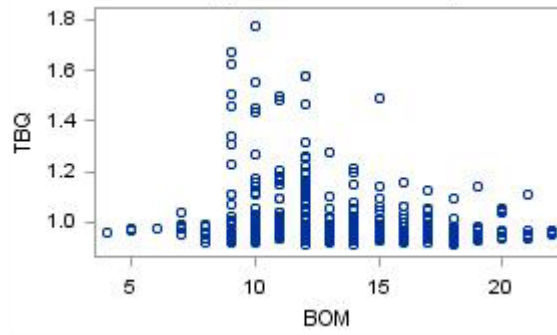


Figure 3. BOM vs. TBQ

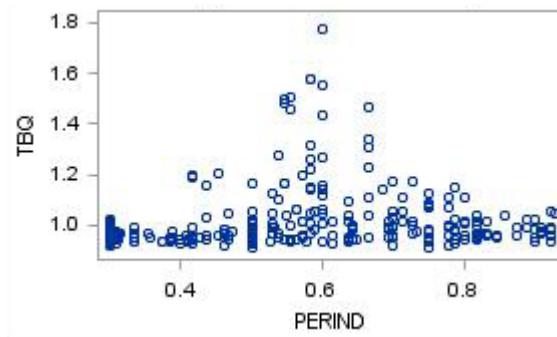


Figure 4. PERIND vs. TBQ

In terms of board meetings (BMEET), coefficients are positively related with TBQ. These empirical findings support our hypothesis that board meetings play a vital role that is more proactive than reactive. Our findings are consistent with those of the extant research conducted by Mangena et al. (2012). These results are upright in terms of agency theory, which recommends that board meetings provide solid monitoring activities to advise and monitor management and enhance performance (Vafeas, 1999). Thus, regular meetings should be conducted to implement strategic decisions to improve firm value and also develop cohesiveness among board members (Lipton & Lorsch, 1992). In summary, more board meetings can result in solid monitoring, leading to an improvement in firm performance (see Figure 5). Overall, it can be concluded that a relationship exists between TBQ and the corporate governance mechanisms in India.

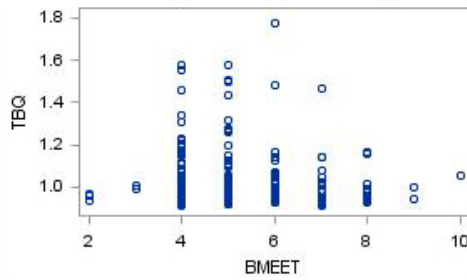


Figure 5. BMEET vs. TBQ

We also find a negative relationship between bank performance and gross non-performing asset ratio (GNPARAT) in Models I, II, V, and VI of Table 2. Moreover, all the coefficients are statistically significant at 1% level. These empirical results are in line with our hypothesis, and the extant literature shows a negative relationship between GNPAAs and bank performance (Berger & De Young, 1997; Podpiera & Weill, 2008; Tripathi & Brahmaiah, 2018). Hence, the bank management should reduce their GNPAAs at the minimal level.

Board Characteristics and GNPAAs

Models III and IV of Table 2 list the empirical results where the dependent variable is GNPARAT and the explanatory variables are board's characteristics. The coefficients of BOD and PERIND are negative and statistically significant for GNPARAT. These results suggest that the corporate governance mechanisms of India can reduce the level of GNPAAs. These empirical results are in line with the findings of Zagorchev and Gao (2015) and Mayur and Saravanan (2017). The findings also suggest that a medium board size and approximately 50%–80% board independency can maintain good quality of assets or reduce GNPAAs.

Board Characteristics and AUC

Models V and VI of Table 2 report the effect of AUC on bank performance. Therefore, the major variables of interest are AUC and PERAUIND. We find that both the coefficients AUC and PERAUIND are negatively related with TBQ and both of them are statistically significant at the 1% level. These empirical results are in line with H4. Figures 6a to 6g exhibit that whenever AUC is between 3 to 6 and the proportion of independent directors is between 80% and 100%, bank performance increases. Hence, we suggest that AUC should be constructed with more independent directors, which can increase the performance and quality of financial information and decisions (Carcello & Neal, 2000; Dechow et al., 1996; McMullen, 1996; Tirole, 2010; Zingales, 1998).

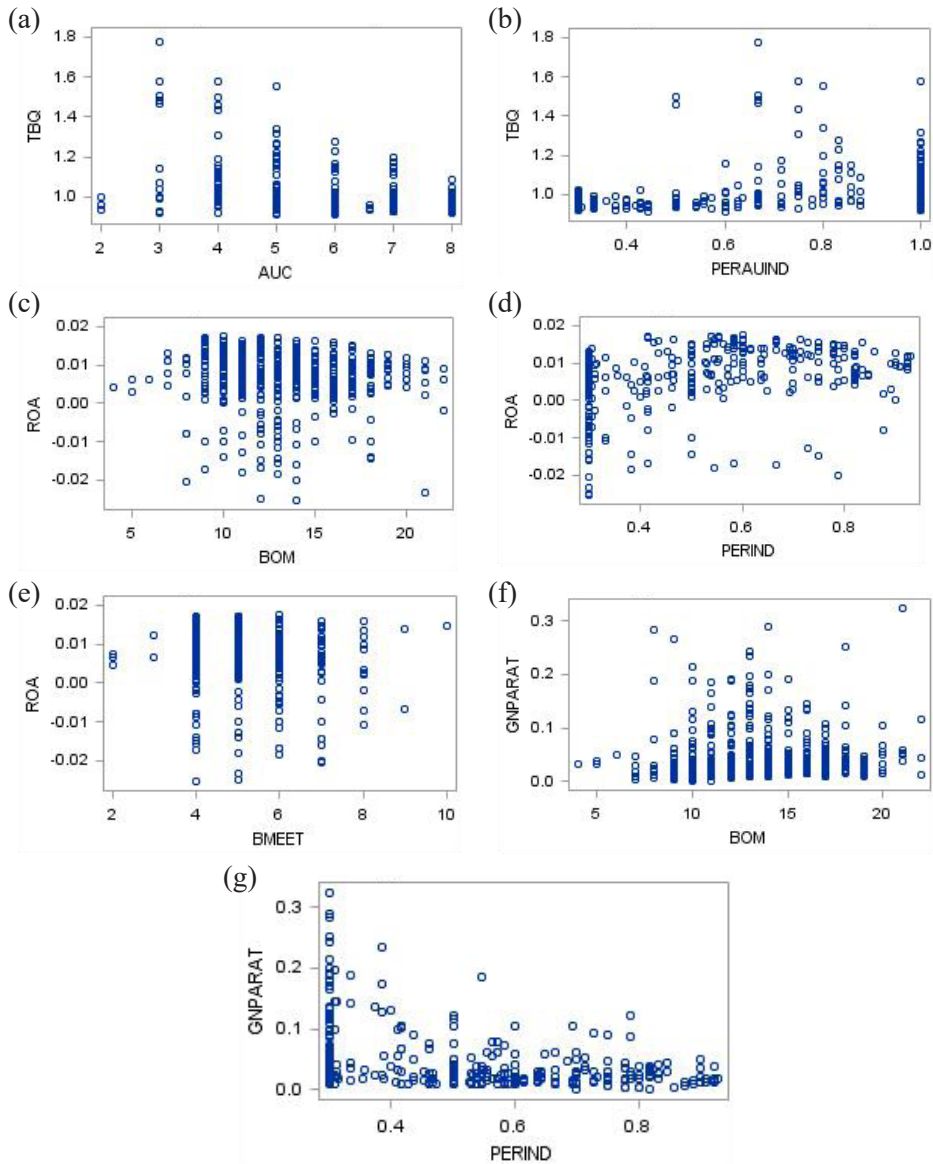


Figure 6. (a) AUC vs. TBQ, (b) PERAUIND vs. TBQ, (c) BOM vs. ROA, (d) PERIND vs. ROA, (e) BMEET vs. ROA, (f) BOM vs. GNPARAT, and (g) PERIND vs. GNPARAT

AUC and GNPA

Models V and VI of Table 2 report linkage between GNPAT and the explanatory variables are AUC and PERAIND. The findings show that a negative relationship exists between AUC and GNPAT and between PERAIND and GNPAT, however all the coefficients are statistically significant at the 1% level. We assert that AUC takes decisions that mitigate the probability of the default of loans (Graham & Narasimhan, 2004). Finally, our empirical results suggest the AUC plays a crucial role in minimising losses from loan defaults and improving bank performance if the size of committee members is between 4 to 8 directors with higher independency of AUC.

NPA Committee, Bank Performance and GNPA

Table 3 shows the GMM empirical results in Models I–IV to examine the effect of NPAC on TBQ and NPAC on GNPAT. However, a few studies have examined the effect of committees on bank performance and asset quality/NPAs, but no study has included NPAC and RSKC to explore the relationship between these two committees and bank performance and NPAs. All the models shown in Table 3 are statistically significant at 1% level. Setting up of NPAC is not mandatory, nevertheless, some banks have done it. We find 29.4% bank-years for NPAC out of a total of 480 bank-years. To examine the effect of NPAC on bank performance and GNPAT, we use a dummy variable of 1 for banks that have established NPAC, otherwise 0 (NPACD). We find a negative relationship between NPACD and TBQ in Models I–II and are statistically significant at 1% level. The results show that the existence of the committee does not increase firm performance. Models III and IV illustrate the empirical relationship between NPACD and GNPAT. We find a negative relationship between NPACD and GNPAT, all the coefficients are statistically significant at 1% level. The results indicate that banks that establish NPAC can improve their asset quality or reduce the GNPA level compared with their competitors. These findings support our hypothesis. Thus, we conclude that NPAC improves good governance in the Indian banking system. Tarchouna et al. (2017) reported that poorly governed banks and governance proxies are positively related to NPAs. We recommend that NPAC should be mandatory for all banks to evaluate the asset quality of banks from time to time.

RSKC, Bank Performance, and GNPA

Table 3 shows the empirical relationship between RSKC and TBQ (Models V and VI). Again, setting up of RSKC is not mandatory; however, some Indian banks have done it. The data shows 80.8% bank-years for RSKC out of a total of 480 bank-years. To examine the effect of RSKC on bank performance and GNPARAT, we use a dummy variable of 1 for banks that have established RSKC, otherwise 0 (RSKCD). We find the coefficients are positive and statistically significant at 1% level. The results show that RSKC does not initiate highly risky projects and take up projects with typical risks with a low probability of default; thus, the firm can improve its performance and enhance the wealth of shareholders. In the same direction, Diamond and Rajan (2009) indicated that banks with good corporate governance introduce appropriate incentives and controls to prevent risk-taking practices.

Models VII and VIII exhibit linkage between RSKCD and NPARAT. The coefficients of RSKCD in both models are negatively related with GNPARAT. All the coefficients are statistically significant at the 1% level. Thus, the results indicate that the establishment of RSKC can more effectively and significantly for reduce the GNPA level compared with other committees of this study. The empirical results are in line with our hypothesis. We assert that RSKC improves governance and asset quality in the Indian banking system.

Steps Taken by Government of India to Mitigate NPAs

One of the primary reasons for such an insurmountable amount of NPAs was the aggressive lending policy adopted by public sector banks. A loan is classified as an NPA if the principal or interest or both are due for repayment for over 90 days. The number of advances lent by public sector banks from the year 2008 to 2014 almost tripled from INR18,000 billion to INR52,000 billion.⁶ The government of India has proposed a 4R strategy to reduce NPAs. One of the important steps taken under this strategy to reduce the NPAs of public sector banks include the insolvency and Bankruptcy Code, which can now revoke the control of the defaulting company from promoters/owners, debarring wilful defaulters from the resolution process and raising funds from the market.

In 2015, the process of asset quality review was initiated by the RBI. It forced banks towards transparency in the recognition and classification of NPAs across the board. It helped both in getting a real picture of the NPA situation and subsequently its reduction. Banks started making required provisions and restructuring existing loans. The banks would have to take a “hair cut” for some time until the NPA situation is under control.

Robustness Check

Table 4 shows that our results are robust to changes in the dependent variables with GMM estimations. The TBQ ratio is the most common measure of valuation in corporate governance studies. We redo this study using an accounting variable (ROA); and another market-related variable, namely average quarterly returns from the market to shareholders (RETQTR), which is a market performance variable. ROA measures the actual performance but might be biased by earnings management.

In our study, two alternative models measuring bank performance and market performance provide information that the main coefficients are equal and statistically significant. Hence, both the inclusion of new directors on the board (BOD) and higher PERIND indicate a positive and statistically significant relationship with ROA and RETQTR. However, the coefficients of the number of board meetings are negative and have a statistically significant relationship with ROA and RETQTR.

We study the relationship between various committees and bank performance/valuation. Hence, we perform a robustness test for all the committees included in this study. We find that the coefficients of all the committees, namely AUC, PERAUIND, NPACD, and RSKCD are statistically significant and positively related to ROA and RETQTR.

In conclusion, bank boards and committees efficiently take up the challenge to improve the corporate governance of banks. Our empirical results indicate that bank boards and various established committees provide an effective platform to elucidate the weaknesses of other corporate governance mechanisms when these mechanisms are introduced to financial institutions. An efficient board and active committees are significant for all stakeholders and play a major role in developing an economic system. Sound governance of banks is a necessary condition to safeguard both the health of financial intermediaries and the business and economic development of a country.

Table 4
GMM estimation: Board and committees characteristics and alternative measures of bank performance (ROA) and (RETQTR)

Variables	Dependent variables							
	ROA				RETQTR			
	I	II	III	IV	V	VI	VII	VII
BOM	0.001 ^b (2.27)	n.a.	n.a.	n.a.	0.038 ^a (6.42)	n.a.	n.a.	n.a.
PERIND	0.015 ^a (6.18)	n.a.	n.a.	n.a.	0.529 ^a (3.18)	n.a.	n.a.	n.a.
BMEET	-0.001 ^a (-6.08)	n.a.	n.a.	n.a.	-0.038 ^a (-6.66)	n.a.	n.a.	n.a.
AUC	n.a.	0.000 ^c (1.85)	n.a.	n.a.	n.a.	0.034 ^a (11.27)	n.a.	n.a.
PERAUIND	n.a.	0.013 ^a (3.51)	n.a.	n.a.	n.a.	0.123 ^a (2.99)	n.a.	n.a.
NPACD	n.a.	n.a.	0.001 ^c (1.87)	n.a.	n.a.	n.a.	0.047 ^a (2.67)	n.a.
RSKCD	n.a.	n.a.	n.a.	0.000 (0.18)	n.a.	n.a.	n.a.	0.052 ^a (2.11)
LNTA	0.003 ^a (4.65)	0.004 ⁰ (2.62)	0.003 ^a (7.33)	0.003 ^a (7.56)	-0.743 ^c (-1.92)	-0.008 (-0.64)	0.033 (1.31)	0.062 ^a (4.03)
LOAN	-0.078 ^a (-8)	-0.087 ^a (-4.48)	-0.076 ^a (-11.08)	-0.073 ^a (-16.47)	0.019 (0.57)	-1.754 ^a (-10.42)	-2.329 ^a (-12.9)	-2.414 ^a (-11.47)
GNPARAT	-0.147 ^a (-15.04)	-0.160 ^a (-9.78)	-0.156 ^a (-31.76)	-0.155 ^a (-44.18)	-1.861 ^a (-4.74)	-0.732 ^a (-6.62)	-1.536 ^a (-9.08)	-1.570 ^a (-8.47)
Sargan χ^2	26.3	25.94	28.1	31.22	29.99	30.74	30.93	30.58
AR(1) test	-2.51 ^b (0.012)	-2.61 ^b (0.009)	-2.35 ^c (0.018)	-2.37 ^b (0.017)	-4.17 ^a (0.000)	-4.31 ^a (0.00)	-4.39 ^a (0.00)	-4.37 ^a (0.00)
AR(2) test	-0.9 (0.370)	0 (0.999)	0.73 (0.467)	0.84 (0.401)	-0.51 (0.611)	-0.68 (0.497)	0.31 (0.757)	0.08 (0.933)
Bank-year	352	352	352	352	352	352	352	352
Types of data	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance

Note: The table reports the GMM estimations. ROA is a dependent variable. RETQTR is averages quarterly returns to shareholders. Explanatory variables are: board size (BOASIZE), proportion of independent directors (PERIND), meetings per year (BMEET), audit committee size (AUC), proportion of independent directors in audit committee (PERAUIND), NPA committee size is a dummy (NPACD), risk management committee size is a dummy (RSKCD), control variables that measure bank business (log of bank total assets, LNTA; the ratio of loans to total assets, LOAN). The *t*-values of coefficient significance are in brackets, statistically significant at 1% (a), 5% (b), and 10% (c).

CONCLUSION

This study finds a positive and significant relationship between board independence and bank performance. The performance also increases with the increase in board size (measured as the total number of members on the board), but after a point, the curve declines forming an inverted U-shaped curve. It indicates that the application of sound corporate governance measures would lead to banks performing better, resulting into an overall expansion of economy and vice versa. The mandatory internal committees have a crucial role to play, which is demonstrated by their effect on the reduction of NPAs.

Banks must comply with laid down regulations both in letter and spirit, and the board of directors have to be objective in their scrutiny. One way of achieving this feat is to compose a board with a majority of independent directors and constitute internal committees for matters of vital importance with the majority of independent directors.

This study does not compare its findings with other developing economies that can provide more extensive findings and conclusion. The study can further expand with different committees and can also examine the impact of COVID-19 effect on banking industry.

Theoretical and Practical Implications

This study has crucial implications for emerging economies. Banks perform the role of depository for lenders with excess capital and the primary source of capital disbursement for commercial enterprises. The significance of a well-functioning board and internal committees in discharging their fiduciary duties is highlighted in this study. Various internal committees other than the mandatory committees, such as AUC, can be constituted depending on the requirement (committees such as the grievance redressal committee and compensation committee). An internal committee comprising a majority of independent directors is found to positively affect the performance of banks. They can help managers disburse good-quality loans and keep a check on risk-laden ventures. Further, the risk committee should anticipate their value at risk proportion on the outstanding loan amount and create sufficient provision to offset the risk.

NOTES

1. In 1996, the Confederation of Indian Industry formed a task force, which was headed by Rahul Bajaj, a leading industrial entrepreneur. The report was titled “Desirable Corporate Governance: A Code,” and the report was submitted in April 1998. Furthermore, to improve corporate governance mechanisms, the regulator of the securities and commodity market in India, Securities and Exchange Board of India (SEBI), had established additional committees in 1998; one of them was the Birla Committee headed by Kumar Mangalam Birla. The Birla Committee submitted their report in early 2000. In March 2001, SEBI initiated the recommendations of the Birla Committee report by introducing Clause 49, The Listing Agreement (Clause 49 hereafter). The implementation of Clause 49 is a leading milestone to transform corporate governance actions in India (Chakrabarti et al., 2008). It was implemented in three phases. In the first phase, Group I firms were instructed to follow the recommendation of Clause 49 by 31 March 2001. In the second phase, Group 2 companies were instructed to follow the recommendations of Clause 49 by 31 March 2002. In the third phase, Group 3 companies were instructed to follow the recommendations of Clause 49 by 31 March 2003. Several major key features/disclosures are recommended in Clause 49 that are mandatory to the companies. The major mandatory recommendations of Clause 49 are to appoint the board of directors, setup the audit committee and other important committees, and report the corporate governance practice in the annual report.
2. The Reserve Bank of India was established on 1 April 1935, in accordance with the provisions of the Reserve Bank of India Act, 1934. The Central Office of the Reserve Bank was initially established in Calcutta (now Kolkata) but was permanently moved to Mumbai in 1937. The Central Office is where the Governor sits and where policies are formulated. Although originally privately owned, after nationalisation in 1949, the Reserve Bank is fully owned by the Government of India. It is the central bank of India. It monitors all the financial functions of the country very closely. Being the central bank of the country, it reviews monetary and fiscal policies from time to time, also implementing them into the system very effectively as and when required.
3. Madan Sabnavis (4 September 2018), “Steering banking system through demonetisation, NPA challenges, Urjit Patel has emerged stronger in two years,” available at <https://www.firstpost.com/business/steering-the-banking-system-through-demonetisation-mpa-challenges-urjit-patel-has-emerged-stronger-in-two-years-5107291.html>.
4. The VIF of a determinant is computed as 1 divided by 1 minus the coefficient of determination of the determinant. The coefficient of determination of the determinant is generated with an auxiliary regression of one of the determinants on the remaining determinants. Strong multicollinearity is indicated by VIF values > 2 , indicating unreliable OLS estimators.
5. All the models used for this paper are free from multicollinearity problems.

6. As per the statement of the Minister of State for Finance and Corporate Affairs given in a written reply in the parliament. He stated a combination of various factors for the increase in NPAs that included aggressive lending practices, wilful default/loan frauds/corruption in some cases, and economic slowdown. He further stated that primarily as a result of the transparent recognition of stressed assets as NPAs, gross NPAs of PSBs, as per RBI data on global operations, rose from INR2,790.16 billion as of 31 March 2015 to INR6,847.32 billion as of 31 March 2017 to INR8,956.01 billion as of 31 March 2018. As a result of government's 4R strategy of recognition, resolution, recapitalisation, and reforms, they have since declined by INR1,060.32 billion to INR1,060.32 billion as of 31 March 2019 (provisional data reported by RBI on 2 July 2019).

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