Do the Attributes of Audit Committee Explain Non-Performing Loans? Evidence from an Emerging Economy

Arifa Akter, Mohammad Kamal Hossain*,
Mohammad Jahangir Alam and Md. Shajul Islam
Department of Accounting and Information Systems,
Jashore University of Science and Technology, Bangladesh

ABSTRACT

This study examined whether various attributes of the audit committee of listed banks in Bangladesh explain the level of non-performing loans (NPLs). This study used a panel data set comprising all 30 listed banks with 250 bank-year observations for the period 2013–2017. It employed the random-effects GLS regression model with cluster robust standard error and AR (1) disturbance to examine the effect of several audit committee attributes on NPLs. We found that holding audit committee meetings frequently and a higher number of independent members in the audit committee facilitate to reduce NPLs. We, however, find no explicit evidence that the other attributes of the audit committee examined (audit committee size, financial experience and financial literacy of the audit committee members, professional qualifications of the audit committee Chairman) contribute in reducing NPLs. The findings will be useful for policymakers of the banking sector in Bangladesh and the relevant regulatory bodies in enabling them to understand the role of the various attributes of the audit committee in the incidence of NPLs.

Keywords: attributes, audit committee, non-performing loans (NPLs), listed banks, Bangladesh

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* Corresponding author: Mohammad Kamal Hossain. Email: karunu2003@yahoo.com

INTRODUCTION

A country's sustainable economic development significantly relies on the financial stability of banks. Banks are the ultimate players of resource mobilisation in both the public and private sectors. "The role is even more pronounced in a developing country like Bangladesh, where banks are the major source of long-term finance in the absence of a mature capital market" (Dey, 2019). In recent decades, however, banks in Bangladesh have been experiencing financial instability. The worsening of asset quality is induced by a rising amount of non-performing loans (NPLs) that lead to liquidity risks, regulatory capital risks and corporate risks (Ghosh, Sen, & Riva, 2020). This circumstance impairs banks' financial stability and limit their ability to lend further, thwarting investment and economic growth of a country (Dey, 2019), and affects the overall trustworthiness of the banking sector in Bangladesh.

There is a robust consensus that poor corporate governance structures as the key determinant for the increasing volume of NPLs in listed banks in Bangladesh (Khatun & Ghosh, 2019). The absence of a strong corporate governance structure results in a poor credit procedures, lack of qualified credit experts, excessive mark-up spreads, lack of credit principles, and lack of borrowers' monitoring policy (Khan, Siddique, & Sarwar, 2020). In this milieu, the Bangladesh Securities and Exchange Commission (BSEC) introduced the Code of Corporate Governance for Bangladesh in 2006 (modified in 2012 and 2018). The Code, amongst others, suggests forming an audit committee for ensuring good corporate governance in listed firms, including banks. The Code provided guidelines vis-à-vis the audit committee composition, required attributes to be a member of the committee, and it also set forth a list of responsibilities of the committee. The audit committee is one of the core corporate governance mechanisms, expected to monitor the internal control process, assessing financial fraud risks, establishing policies to prevent fraud, with the setting up of a whistle-blower policy of listed corporations (Hossain, 2020). As an independent director with accounting knowledge, the chairman of an audit committee, in particular, is responsible for internal audits and controls and plays a critical role in eliminating company financial irregularities (Li & Li, 2020). Consequently, the presence of a strong audit committee in banks is projected to reduce bank management irregularities (Ali, 2018). This expectation ultimately

indicates that an audit committee with strong attributes acts as an effective mechanism in reducing the level of NPLs at the expected level. Moreover, the Bangladesh Bank, the central bank of Bangladesh, had also issued various courses of actions for the audit committee to ensure a better policy framework and transparency in banking activities and to manage NPLs of the banking sector in Bangladesh.

Despite having the audit committee, listed banks in Bangladesh have been facing inadequate credit monitoring and lack of a better policy framework regarding loans and advances. As a result, the volume of NPLs is growing by the day, signaling a warning sign for this frontier economy where long-term economic growth is a top priority for all stakeholders (Ghosh et al., 2020). Recent statistics from Bangladesh Bank show that the proportions of NPLs in Bangladesh were 10.30 percent and 9.32 percent in 2018 and 2019, respectively. Bangladesh scored the second position in Asia and was ranked at 24 in the world in terms of NPLs (Islam, 2020). This high volume of NPLs causes a dipping in confidence among both depositors and foreign investors, as it hinders economic recovery by reducing operational margins and eroding bank capital (Ali, 2018). This circumstance raises an empirical question of whether the attributes of the audit committee of listed banks in Bangladesh have any relation at all with NPLs, or are they simply unrelated? This question motivated this study. This study, therefore, examined, among other determining factors, the role of audit committee attributes in reducing NPLs in listed Bangladeshi banks.

Several studies (e.g., Adnan, Rashid, Meera, & Htay, 2011; Al Zobi, Shubita, Alomari, Almatarneh, & Alrawashdeh, 2019; Angahar & Mejabi, 2014; Pradhan, Shah, Bhandari, Mahato, Adhikari, & Bam, 2019; Shan & Xu, 2012; Saada, 2017; Tarchouna, Jarraya, & Bouri, Ali, 2018; 2017; Khan, Ilyas, & Khan, 2019; Al Masud & Mamun, 2019; Fiador & Sarpong-Kumankoma, 2020; Adegboye, Ojeka, & Adegboye, 2020; Khan et al., 2020; Li & Li, 2020; Islam, M. N., 2020; Tarchouna, Jarraya, & Bouri, 2021) examined the efficacy of corporate governance mechanisms in reducing NPLs across developed and developing economies. Those studies documented that the corporate governance structures of banks explained NPLs. However, there are enormous differences in corporate governance structures, bank management, banking regulations and their influences on NPLs between Bangladesh and other countries. Thus, the findings in developed and other developing economies may not apply to Bangladesh.

As an important sector, listed banks in Bangladesh have received less attention in the literature examining the efficacy of corporate governance structures in reducing NPLs. Up to now, few studies (e.g., Hasan, Zayed, & Islam, 2019; Khatun & Ghosh, 2019; Saha & Ghosh, 2019; Al Masud & Mamun, 2019; Rezina, Chowdhury, & Jahan, 2020) have tended to focus on this area. What is still less clear is the impact of attributes of the audit committee on NPLs of Bangladeshi listed banks as no single study has examined it. Moreover, prior Bangladeshi studies on the corporate governance structures-NPLs relationship can, however, be criticised in terms of methodology and the frameworks used. First, these studies have employed inadequate and inappropriate research designs. For example, the study of Hasan et al. (2019) has been descriptive in nature, while Khatun and Ghosh (2019) and Saha and Ghosh (2019) have used the OLS regression model for panel data without conducting the required diagnostic tests (e.g., tests for multicollinearity, linearity and normality, homoscedasticity and autocorrelation) that check the goodness-of-fit of the model. Rezina et al. (2020) performed a study using a sample of just 10 out of 30 commercial banks listed on the Dhaka Stock Exchange, whereas Al Masud and Mamun (2019) conducted a study with a sample of solely state-owned commercial banks. Second, the OLS model ignores the cross-sectional and time series of data and neglects the individuality/heterogeneity that may exist among banks (Hossain, 2020). These problems along with simultaneity and measurement error pose endogeneity bias. The OLS model may yield biased and misleading estimations in the presence of endogeneity. Third, the studies reviewed inadequate literature and used inappropriate theoretical frameworks. Finally, there have been no studies that have entirely centered on the effect of audit committee attributes on NPLs. They examined a maximum of four corporate governance mechanisms with some irrelevant control variables.

This fact, therefore, uncovers an explicit empirical research gap that leads to an examination of whether attributes of the audit committee are matters in controlling NPLs in listed banks in Bangladesh. This study appears to be the first empirical study investigating the impact of attributes of the audit committee on NPLs in listed banks in Bangladesh. It is distinct in the three areas from previous Bangladeshi studies on the corporate governance structures-NPLs relationship. First, we employed the panel data model, namely, the random-effects model. This model produces reliable

and unbiased results of multiple regression by addressing endogeneity bias caused by omitted variables, simultaneity and measurement error. Moreover, we confirmed the presence of heteroskedasticity and autocorrelation problems in the data sets. We addressed them by using the random-effects GLS regression model with optional robust standard error and AR (1) disturbances. Second, unlike prior studies, we examined the efficacy of audit committee attributes on NPLs in all listed banks in Bangladesh. Finally, we incorporated six attributes of audit committees and enough relevant control variables in the model as regressors.

We found that audit committee meetings and independent members in the audit committee facilitate banks to reduce NPLs. However, we found no credible evidence that the audit committee size, financial experience and financial literacy of audit committee members and professional qualifications of the audit committee Chairman act as determinants for reducing NPLs in listed banks in Bangladesh. The outcomes of this study are important for Bangladeshi listed banks to manage the quality of assets and to reduce NPLs. This is because the economy of an emerging country like Bangladesh is predominantly bank-based such that any instability caused by NPLs in the banking sector will lead to a disastrous economy for the country.

The remainder of the paper proceeds as follows. The following section reviews the existing literature on the attributes of the audit committee and NPLs and develops the hypotheses accordingly. Section 3 outlines the methodology used for this study and describes all the variables, while Section 4 analyses the findings and discusses the results. Finally, we conclude the study in Section 5.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

We examined the role of the audit committee attributes of Bangladeshi listed banks in reducing NPLs. We assumed that a bank with better attributes in its audit committee is more likely to monitor the internal control process, assess financial fraud risks and establish policies to prevent fraud that leads to conducting a rigorous loan appraisal, and thus, manage NPLs at an expected level. We examined six audit committee attributes, including audit

committee size, audit committee meetings, audit committee independence, financial experience of audit committee members, financial literacy of audit committee members, and professional qualifications of the audit committee Chairman, to know if any of these attributes differentially affect NPLs. Therefore, the literature review and hypothesis development was done independently for each attribute of an audit committee.

Audit Committee Size, Frequency of Audit Committee Meetings and NPLs

The size and frequency of meetings of the audit committee are interconnected attributes because the number of audit committee meetings increases as the audit committee size becomes larger (Raghunandan & Rama, 2007). The BSEC (2012) suggested listed firms form an audit committee with at least three members and to hold at least four meetings in a financial year.

According to the Resource Dependency Theory, a larger committee brings knowledge, diversified skills, wider experience and intellect to the board (Mollah, Farooque, & Karim, 2012). We argue that using diversified knowledge, skills, experience and intellect of members of a large audit committee and a higher number of audit committee meetings can ensure good governance. It enables banks to monitor the internal control process, assesses financial fraud risks and establishes policies that prevent fraud. Consequently, factors that cause a high level of NPLs, such as wrong client selection, weak business and industry analysis, political pressure to sanction loans, can be controlled, and thus NPLs reduced. This view is supported by Hovey (2012) who argued that a large audit committee comprises people with diverse experience and financial expertise can ensure higher bank efficiency, which, in turn, reduces bank's credit risks. Al-Smadi (2013) and Magembe, Ombuki, and Kiweu (2017) supported this hypothetical relationship in their empirical studies. They found a significant negative association between audit committee size and non-performing loans in the context of Saudi Arabian and Kenyan banks, respectively. In the same vein, Abubakar, Abubakar, Shehu, and Nahari (2015) documented that a large board size reduced discretionary loan loss in Nigerian banks.

A high frequency of audit committee meetings requires that a substantial amount of time and energy is invested to perform audit committee functions (Magembe et al., 2017). Consequently, credit risks remain under surveillance regularly and thus controlling and preventing fraud risks thus reducing credit risks (Zgarni, Fedhila, & Gaied, 2018). Therefore, we argue that the number of audit committee meetings may have a negative impact on NPLs. Therefore, the following hypotheses regarding the relationship of audit committee size and frequency of audit committee meetings with NPLs were developed.

H_1: There is a significant negative relationship between audit committee size and NPLs in listed banks in Bangladesh.

H_2: There is a significant negative relationship between the frequency of audit committee meetings and NPLs in listed banks in Bangladesh.

Audit Committee Independence and NPLs

Regarding independent members in the audit committee, the BSEC (2012) suggested listed firms to form an audit committee with non-executive directors, of whom at least one shall be an independent director of the company, except the Chairman of the Board. Hypothetically, the presence of independent members in an audit committee of a bank may reduce its NPLs because the committee watches over managers' activities regarding credit risks independently (Abbott, Parker, & Peters, 2004; Kallamu & Saat, 2015). Banks require judging the potential borrowers strictly in terms of loan payback capacity; if not, there is a likelihood to extend credit to potential defaulters. Similarly, if banks grant credit unethically, for example, doing an undue favour for maximising self-interest or taking bribes from borrowers for granting loans, there is a high possibility of increasing the volume of NPLs that poses agency problems which result in impairing shareholders' interests. An independent audit committee oversees a bank's financial reporting, its related internal controls and risks that reduces agency problems related to granting credit unethically and expecting a negative relationship between an independent audit committee and NPLs. Ali (2018) validated this theoretical relationship by conducting an empirical study on 86 banks listed on the stock exchanges in Pakistan, India and Bangladesh for the period 2006–2016. Similarly, for the period 2009–2016, Al Zobi et al. (2019) revealed a similar link between audit committee independence

and credit risks in 13 Jordanian commercial banks. Therefore, the literature leads to the following hypothesis to be tested:

H_3: There is a significant negative relationship between audit committee independence and NPLs in listed banks in Bangladesh.

Financial Literacy of the Audit Committee Members and NPLs

There is a rarity of empirical studies on the relationship between financial literacy of the audit committee members and NPLs. Audit committee members with adequate financial knowledge can reduce credit risks as sufficient financial literacy enhances members' ability to monitor internal risks control and risk management processes (Bangladesh Enterprise Institute, 2004). In the same way, Saada (2017) asserts that NPLs that result from information asymmetry between shareholders and managers, managers and creditors, depositors and regulators can be reduced by increased disclosure and control of adequate credit policies. Song and Windram (2000) also argued that financial reporting problems, the major hindrance to establishing better control, are less frequent where the audit committee has highly literate members.

The BSEC (2012) has issued a clear directive in this regard that "all members of the audit committee should be financially literate and at least one member shall have an accounting or related financial management background".[1] This guideline differs from the argument of Braiotta (1999) who contended that the audit committee should be composed of both financial (e.g., accounting, finance) and non-financial (e.g., sociology, psychology) experts. However, for financial institutions where complex accounting and auditing issues arise regularly, members with accounting or finance expertise are the most appropriate (Abbott et al., 2004). This is because credit risk management starts with the assessment of risks and for this purpose, banks essentially need to differentiate their assets between the balance sheet and off-balance sheet by classifying assets according to the probability of loss and the possibility of recovery (Saada, 2017). Due

1 According to the BSEC (2012, p. 6883), "the term *financially literate* means the ability to read and understand the financial statements like a statement of financial position, statement of comprehensive income, statement of changes in equity and cash flow statement and a person will be considered to have accounting or related financial management expertise if he or she possesses professional qualification or Accounting or Finance graduate with at least 10 (ten) years of corporate management or professional experiences."

to the information asymmetry problem and the misty nature of banks, it is difficult for non-financial experts to oversee the risks related to loans and advances. Consistent with the hypothetical literature, Krishnan and Lee (2009) and Abubakar et al. (2015) empirically provided evidence that the presence of accounting or finance experts in the audit committee of banks improves the quality of loan portfolios. Therefore, the following hypothesis was developed.

H_4: There is a significant negative relationship between financial literacy of audit committee members and NPLs in listed banks in Bangladesh.

Financial Experience of Audit Committee Members and NPLs

An audit committee consists of members with financial experience which works as a tool for a governance mechanism that prevents an agent's self-seeking interest and in turn reduces information asymmetry (Wiseman, Rodriguez, & Mejia, 2012). NPLs arise from the negligence of the precautionary principle against moral hazards that can be negatively affected by the reduction of the asymmetric information problem (Kennedy, 1973). Where most audit committee members are substantially experienced, it becomes possible to establish such an incentive system in a way that the prompt payment benefit oversees the advantage of late payment and thus reduce the tendency of loan default. Lower credit risk is associated with higher performance (Almekhlafi, Almekhlafi, Kargbo, & Hu, 2016) and a positive association between performance and audit committee members' prior experience is found in some literature (Aldamen, Duncan, Kelly, McNamara, & Nagel, 2012). Therefore, a negative impact on NPLs can be projected. Given the fact, the BSEC (2012) stated that "at least 1 (one) member shall have an accounting or related financial management experience".[2]

Due to a high volume of default loans, loan managers set up a target level to progressively reduce the amount (Ozili, 2019). Here, audit committee members are required to have accounting and finance experience to solve these complex issues (Abbott et al., 2004), and they work with the loan team to combat credit risks by helping managers establish the target

2 According to the BSEC (2012), "a person will be considered to have accounting or related financial management expertise if (s) he possesses professional qualifications or Accounting/Finance graduate with at least 12 (twelve) years of corporate management/professional experiences."

as a strict but realistic one. It is also the committee members' responsibility to review the system of internal controls and manage financial risks (Al Zobi et al., 2019). This thought is supported by Zhang, Zhou, and Zhou (2007) who empirically documented the fact that the audit committees comprising fewer accounting and financial specialists experiences poor internal controls, which may lead to a higher levels of NPLs. Therefore, the following hypothesis was derived.

H_5: There is a significant negative relationship between financial experience of the audit committee members and NPLs in listed banks in Bangladesh.

Professional Qualification of Audit Committee Chairman and NPLs

By establishing a well-organized management information system that provides updated information about loan portfolio quality and any inherent risk factors, a professionally qualified Chairman of the audit committee can ensure complete control over non-performing loans (Speklé, 2012). Intellectual abilities of an individual are reflected by his/her level of education (Wiersema & Bantel, 1992) and due to having good cognitive ability, which helps to analyse and process information effectively, educated people can take a good quality decision (Papadakis & Barwise, 2002). The Code of Corporate Governance for Bangladesh issued by the Bangladesh Enterprise Institute (2004), therefore, imposes that the audit committee Chairman has to have professional qualifications and this requirement is well justified because the Chairman having a professional qualification can well understand the financial report provided by borrowers to assess their financial condition before sanctioning loans. Sophisticated re-assessment of loans is one of the major tools to successfully reschedule and restructure loans to reduce the possibility of overestimation of non-performing loans (Speklé, 2012). Having in-depth knowledge of accounting and finance, professional qualification holders are the most preferable personnel to do the job. The above literature led to the development of the following hypothesis.

H_6: There a significant negative relationship between an audit committee Chairman's professional qualification and NPLs in listed banks in Bangladesh.

METHODOLOGY

Sample and Data

Our sample comprised all 30 commercial banks listed on the Dhaka Stock Exchange. We used a balanced data set spanning five years, from 2013, the year following the Code's adoption by the Bangladesh Securities and Exchange Commission (BSEC), through December 31, 2017, the year the Code was amended. We collected related data on NPLs' from the financial statements and data related to audit committee attributes from the audit committee report published in annual reports of the respective banks. However, due to the absence of data such as academic background, financial experience and skills of audit committee members of few banks in their annual reports, we collected them from the profiles of the directors published on the websites of these banks.

Variable Definition and Measurements

Dependent variable

The dependent variable of this study was the ratio of non-performing loans (NPLs). Widely varying definitions of NPLs have appeared in different countries, bodies and studies. According to the International Monetary Fund (IMF, 2005), "a loan is non-performing when payments of interest and/or principal are past due by 90 days or more; or interest payments equal to 90 days or more have been capitalized, refinanced, or delayed by agreement; or payments are less than 90 days overdue, but there are other good reasons—such as a debtor filing for bankruptcy—to doubt that payments will be made in full." Ghosh (2015) and Tarchouna et al. (2017) defined NPLs as the sum of non-accrual loans and all loans that have been due for ninety days or more in the past.

NPLs in Bangladesh are graded as substandard, doubtful, and bad or loss. They are computed based on identical parameters. If a loan is overdue for the three months or more but less than nine months, a loan is substandard; doubtful if it is overdue for nine months or more but less than twelve months; and bad or a loss if it is overdue for twelve months or more (Bangladesh Bank, 2019). While various definitions of NPLs have been suggested, we included substandard, doubtful, and bad or loss loans

in NPLs suggested by the Bangladesh Bank, and we calculated the ratio of NPLs as the proportion of non-performing loans to total loans of a bank.

Independent variables

The independent variables employed to explain NPLs were the attributes of the audit committee of listed banks in Bangladesh. We examined six audit committee attributes. First, audit committee size (ACS), which represents the number of members on the audit committee. Second, the frequency of audit committee meetings (ACM), which represents the number of meetings held by the audit committee during a financial year. Third, audit committee independence (ACI) that denotes the proportion of independent members in an audit committee of a bank. Fourth, financial literacy of audit committee members (MFL) was measured by a dummy variable that took 1 if all members of the audit committee are financially literate, 0 otherwise. Fifth, financial experience of the audit committee members (FEM) represents the proportion of audit committee members having financial experience. Finally, professional qualification of the audit committee Chairman (CPQ) was operationalised by a dummy variable that took 1 if the Chairman of the audit committee had a professional qualification, 0 otherwise.

Control variables

In our study, we used bank age, bank size, growth of the gross domestic product, interest rate and return on assets as control variables to reduce potential bias arising from the omitted variables.

Bank age (BKA): Bank age was measured by the number of years since listing on the Dhaka Stock Exchange. Pradhan et al. (2019) provided evidence in an empirical study that the older the bank, the higher the credit risks, a proxy of NPLs. Therefore, we expected a positive association between bank age and NPLs. In the same vein, Shan and Xu (2012) documented a high level of bad debt provisions for longer listed companies.

Bank size (BKS-Ln): We measured bank size by the natural logarithm of a bank's total assets. Misra and Dhal (2010) concluded that larger banks were more prone to risk-taking by granting loans to low-quality borrowers which resulted in a high level of NPLs. However, Hu, Li, and Chiu (2004) differently argued that larger banks have adequate resources and experience to maintain strong internal control of assessing credit

applications thoroughly, which ultimately enhances their loan portfolio quality. Therefore, we expected a negative association between bank size and NPLs.

Gross domestic product (GDP) growth: GDP growth was measured by the percentage of the difference between the current year's GDP and the previous year's GDP divided by the previous year's GDP of Bangladesh at the end of its fiscal year. The European Central Bank (2011) documented that GDP growth significantly explained NPLs in the previous decade. This result was reinforced by Baboucek and Jancar (2005), Lee, Chen, Chang and Chen (2020) and Fiador and Sarpong-Kumankoma (2020), who found that GDP growth slowed down NPLs. Also, Keeton and Morris (1987) found that changes in an economic condition caused a significant part of asset quality. Thus, we expected the relationship between GDP and NPLs to be negative.

Interest rate (IR): The interest rate is proxied by the real interest rate. It is the difference between the long-term interest rate and the rate of inflation (Chaibi & Ftiti, 2015; Tarchouna et al., 2017). Castro (2013), Tarchouna et al. (2017) and Ghosh et al. (2020) documented that high-interest rate increased pressure on borrowers and weakened their capacity to pay back principals and interests; consequently, the volume of NPLs increased. Therefore, we hypothesised a positive association between the rate of interest and NPLs.

Return on assets (ROA): ROA indicates the performance of a bank and points the efficiency of the bank management in generating a profit by using its assets (Hossain et al., 2017). It is measured as the net profit to total assets of a bank (Khan et al., 2019). Prior studies (e.g., Boudriga, Boulila Taktak, & Jellouli, 2010; Khan et al., 2019; Khan et al., 2020) argued that as ROA is high, banks avoid investing in risky projects. This is because high ROA indicates the financial stability of banks and they do not feel pressure to generate income at any cost. Therefore, we expected a negative association between ROA and NPLs.

Model Specification

We employed a panel data regression model to examine the effect of the audit committee attributes on NPLs of listed banks in Bangladesh. We performed three tests (e.g., *F*-test, Breusch & Pagan (1980) Lagrange

Multiplier (B-P LM) and Hausman (1978) specification tests) to choose the most suitable panel regression model among the pooled ordinary least squares model (OLS), fixed-effects model and random-effects model.

Table 1: Estimations for Tests of The Appropriate Model Selection

Types of test	Estimations
F-test (29, 102)	24.64***
B-P LM test (X^2) (01)	195.60***
Hausman test (X^2) (18)	9.10
Breusch-Pagan/Cook-Weisberg test (X^2)	165.40***
Wooldridge test, F(1, 29)	4.217**

Notes:
***p<0.01, **p<0.05, *p<0.1
F-test refers to *F*-test in a fixed-effects model.
The B-P LM test (X^2) refers to the Breusch and Pagan's (1980) Lagrange Multiplier test.
The Hausman test (X^2) refers to the Hausman specification test.

Table 1 provides the estimations of the *F*-test and B-P LM test (X^2) for the panel data regression model was significant ($p<0.01$); favouring the fixed-effects or random-effects models over the OLS. We, therefore, conducted the Hausman specification test to choose the appropriate model between the fixed-effects and the random-effects models. The estimation of the Hausman specification test for the panel data regression model was found insignificant (see Table 1), favouring the random-effect model over the fixed-effects model for this study. Further, estimations for the Breusch-Pagan/ Cook-Weisberg test (X^2) of the panel data regression model was significant ($p<0.01$), indicating that heteroscedasticity is likely a problem in the model. The estimation for the Wooldridge test was significant ($p<0.05$) in the model (see Table 1), indicating that the model was affected by autocorrelation. Therefore, to deal with the heteroscedasticity and autocorrelation problem with the model, we used the random-effects GLS regression model with cluster robust standard error and AR (1) disturbance. The model used is specified below:

$$NPLs_{it} = \alpha + \beta_1 ACS_{it} + \beta_2 ACM_{it} + \beta_3 ACI_{it} + \beta_4 FEM_{it} + \beta_5 MFL_{it} + \beta_6 CPQ_{it} + \beta_7 BKA_{it} + \beta_8 BKS\text{-}Ln_{it} + \beta_9 GDP_{it} + \beta_{10} IR_{it} + \beta_{11} ROA_{it} + \beta_{12} Year\ dummies_{it} + \varepsilon_{it} + u_{it} \quad (1)$$

To confirm the robustness of the results derived from model 1, we employed the feasible GLS (FGLS) model alternatively. The FGLS provides correct estimations in the presence of heteroscedasticity across panel and AR (1) autocorrelation within the panel (Greene, 2012). Therefore, the second model used is shown below:

$$NPLs_{it} = \alpha + \beta_1 ACS_{it} + \beta_2 ACM_{it} + \beta_3 ACI_{it} + \beta_4 FEM_{it} + \beta_5 MFL_{it} + \beta_6 CPQ_{it} + \beta_7 BKA_{it} + \beta_8 BKS\text{-}Ln_{it} + \beta_9 GDP_{it} + \beta_{10} IR_{it} + \beta_{11} ROA_{it} + \beta_{12} Year\ dummies_{it} + \varepsilon_{it} \quad (2)$$

Where NPLs denote the ratio for non-performing loans of listed Bangladeshi banks; α denotes the intercept; ACS denotes audit committee size; ACM denotes the frequency of audit committee meetings; ACI denotes the proportion of independent members in an audit committee; FEM represents the proportion of the audit committee members having financial experience; MFL denotes financial literacy of the audit committee members; CPQ denotes the professional qualifications of the audit committee Chairman. BKA represents bank age; BKS-*Ln* denotes bank size; GDP denotes the growth of the gross domestic product; IR denotes the interest rate; ROA represents the return on assets; *t* denotes the period from 2013 to 2017; and *i* indicates the banks, while β_1:β_{12} denote coefficient terms.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 2 presents the descriptive statistics of both the dependent and independent variables. The average NPLs with a standard deviation was 7.76 percent and 13.04, respectively, ranging from a maximum of 80 percent to a minimum of 0.7 percent for the study period 2013–2017. The mean audit committee size was 4.37, with a minimum size of 3 and a maximum size of 6. On average, an audit committee was composed of 44.32 percent independent members, with a standard deviation of 16.43. The range of the proportion of independent members was 0–100 percent. Regarding the financial experience of the audit committee members, only 39.73 percent (average) members were experienced in financial matters. The range value

was 0–100 percent with a standard deviation of 22.48. The mean of the frequency of audit committee meetings was 10 with a standard deviation of 4.98, ranging from 4–25 meetings. Regarding the financial literacy of the audit committee members, the audit committee consisted of three-fourth (76 percent) financially literate members and remaining members were financially illiterate.

As regards control variables, the summary showed that bank age ranged from 5–34 years, with a mean age of 18 years. The average size of listed banks, measured by the natural logarithm of total assets of a bank, was 11.31, with a range of 10.94–11.74. The average GDP growth with a standard deviation was 6.7 percent and 0.452, respectively, exhibiting a stable economic condition of the country. The mean of the interest rate and standard deviation were 4.98 percent and 1.48, respectively, with a range of 3.07–6.89 percent. Finally, the average performance (ROA) and a standard deviation were 0.87 percent and 1.09, respectively, with a minimum ROA of –7.50 and a maximum of 3.78.

Table 2: Descriptive Statistics

Variables	Mean	Std. Dev	Min	Max
Non-performing loans (NPLs), percentage	7.76	13.04	0.7	80
Audit committee size (ACS)	4.37	0.91	3	6
Audit committee meetings (ACM)	10.00	4.98	4	25
Audit committee independence (ACI), percentage	44.32	16.43	0	100
Financial experience of the audit committee members (FEM), percentage	39.73	22.48	0	100
Bank age (BKA)	18.00	8.93	5	34
Bank size (BKS-*Ln*)	11.31	0.17	10.94	11.74
GDP growth	6.7	0.452	6.01	7.28
Interest rate (IR), percentage	4.98	1.48	3.07	6.89
Return on assets (ROA), percentage	0.87	1.09	–7.50	3.78
Dummy variables				**Percentage**
Financial literacy of the audit committee members (MFL)		Financial literacy		0.76
		No financial literacy		0.24
Professional qualification of the audit committee Chairman (CPQ)		Professional qualification		0.27
		No professional qualification		0.73

Table 3: Pearson Correlation Matrix

	NPLs	ACS	ACI	FEM	MFL	CPQ	ACM	BKA	KS-*Ln*	GDP	IR	ROA
NPLs	1											
ACS	−0.040	1										
ACI	−0.253***	−0.438***	1									
FEM	−0.043	−0.009	0.159**	1								
MFL	−0.025	0.011	−0.297***	0.246***	1							
CPQ	−0.123	0.077	−0.326***	0.205**	0.385***	1						
ACM	−0.275***	0.179**	−0.063	0.315***	0.120	0.115	1					
BKA	0.386***	0.095	−0.008	−0.036	−0.078	−0.076	0.166**	1				
BKS-*Ln*	−0.390***	0.206**	0.144*	−0.028	−0.233***	−0.180**	0.255***	0.263***	1			
GDP	−0.089	−0.156*	0.236***	0.071	−0.210***	−0.209***	−0.040	−0.137*	0.363***	1		
IR	−0.122	−0.148*	−0.009	0.065	0.039	0.226***	0.021	−0.478***	−0.216***	−0.049	1	
ROA	−0.221***	0.077	0.153*	−0.075	−0.196**	0.004	0.087	0.042	−0.062	−0.130	−0.208**	1
TOL		0.621	0.464	0.577	0.601	0.539	0.657	0.588	0.540	0.671	0.678	0.651
VIF		1.61	2.15	1.73	1.66	1.85	1.52	1.7	1.85	1.49	1.47	1.53

Notes: ***p<0.01, **p<0.05, *p<0.1

Correlation Matrix

Table 3 reports the pair-wise Pearson correlation coefficients among the variables, with the tolerance (TOL) values and its reciprocal, variance inflation factors (VIP), of the variables. The variables were linearly correlated with each other as the range of the coefficients of correlation between the variables was 0.004–0.478 (regardless of positive or negative sign). These results also revealed no multicollinearity problem among the independent variables as the highest coefficient of correlation (0.478) was less than 0.80 (Gujararti & Porter, 2015). The estimations of TOL were not less than 0.2 and estimations of VIF were not 10 and above, confirming furthermore that multicollinearity was not a problem.

Regression Results

Table 4 presents the regression results of the study. Model 1 provides regression estimations of the impact of attributes of the audit committee on NPLs of Bangladeshi listed banks, using the random-effects GLS regression model with the cluster robust standard error and AR (1) disturbance, while Model 2 provides regression estimations of the same, employing the FGLS model to check the robustness of the results derived from model 1. Therefore, we mainly relied on the findings derived from the baseline model 1.

Table 4: Random-effects Regression Results

Variables	Model 1 Estimations of RE GLS regression	Model 2 Estimations of FGLS regression
Audit committee size (ACS)	−0.0011(0.0280)	−0.0045(0.0292)
Audit committee meetings (ACM)	−0.0118(0.0047)**	−0.0146(0.0053)***
Audit committee Independence (ACI)	−0.0028(0.0014)**	−0.0042(0.0021)**
Financial experience of audit committee members (FEM)	−0.0022(0.0016)	−0.0023(0.0015)
Financial literacy of audit committee members (MFL)	−0.0918(0.0899)	−0.0366(0.0866)
Professional qualification of audit committee chairperson (CPQ)	−0.0840(0.1734)	−0.0012(0.0794)
Bank age (BKA)	0.0409(0.0133)***	0.0180(0.0048)***
Bank size (BKS-*Ln*)	−0.2488(0.1308)*	−0.2276(0.0672)***
Gross domestic product (GDP) growth	−0.0027(0.0250)	−0.0164(0.0107)
Interest rate (IR)	−0.0052(0.0053)	−0.0018(0.0025)
Return on Assets (ROA)	−0.0048(0.0023)**	−0.0071(0.0029)**

_cons	3.5342(1.4998)**	4.3117(0.8418)***
Year dummies	Included	Included
Number of observation	150	150
R-sq: within/between/within	0.2487/0.4578/0.4367	
Wald chi^2 (19)	166.89***	88.82***

Notes: Robust standard errors in parentheses; ***p<0.01, **p<0.05, *p<0.1

As shown in Model 1, the regression weight of ACS on NPLs was negative and statistically insignificant, holding all others constant. Model 2 also documents the same result, confirming the robustness of the outcomes of Model 1. Therefore, all these findings rejected H_1. As can be seen in Model 1 that ACM had a negative regression weight and it statistically significantly predicts NPLs at $p<0.05$. The coefficient of −0.0118 indicated that a unit increase in the audit committee meetings led to 0.0118 unit decrease of NPLs. Similarly, Model 2 provided a similar relationship at $p<0.01$. Thus, all these outcomes failed to reject H_2. Further, from Model 1, regression weight of ACI on NPLs reported negative and statistically significant at $p<0.05$, all other attributes of the audit committee included in model held constant. The coefficient of −0.0028 meant that for every one-unit increase in independent members in the audit committee, NPLs decreased by 0.0028 units. Also, Model 2 supported a consistent relationship with Model 1. These results, therefore, support H_3. As reported by Model 1, shown in Table 4, FEM, MFL and CPQ had a negative regression weight but they did not statistically significantly predict NPLs. Model 2 also confirmed the consistent results. All these results, therefore, rejected hypotheses H_4, H_5 and H_6.

On the question of the effect of control variables on NPLs, both, Model 1 and Model 2, provided credible evidence that BKA had a positive and statistically significant weight on NPLs at $p<0.01$. The coefficient value indicated that a one unit increase in bank age would decrease non-performing loans by 0.0409. As can be seen in Model 1, BKS-*Ln* had a negative regression weight and it statistically significantly predicted NPLs at $p<0.10$. The coefficient value indicated that a unit increase in bank size led to 0.2488 unit decrease of NPLs. Model 2 also produced a statistically significant and negative weight but at $p<0.01$. As reported in both, Model 1 and Model 2, regression weights of GDP and IR on NPLs were negative and statistically insignificant. Finally, it can be seen from Model 1 that ROA had a negative regression weight and it statistically significantly predicted NPLs at $p<0.05$. Model 2 also supported a similar result.

Discussion

The banking sector in Bangladesh has been suffering from a high level of NPLs that caused poor performance, immense capital shortage, dipping confidence of both depositors and foreign investors in the sector. Some of the key reasons for a high level of NPLs of listed banks in Bangladesh were inadequate credit monitoring and lack of a better policy framework regarding loans and advances, nevertheless, there was an audit committee along with other committees (e.g., risk management committee). This circumstance raised an empirical question of whether attributes of the audit committee have any relation at all with NPLs, or are they simply unrelated. This study, therefore, set out with the aim of examining whether the audit committee attributes, amongst other determining factors, explained the level of NPLs of listed banks in Bangladesh.

Contrary to the hypothesis, we found that audit committee size insignificantly affected the level of NPLs in listed banks in Bangladesh. The result contrasts with those of Al-Smadi (2013), Abubakar et al. (2015) and Magembe et al. (2017) who documented that the audit committee size is one of the beneficial determinants for reducing non-performing loans. This outcome also contradicted the Resource Dependency Theory as audit committee size in this study did not facilitate banks to acquire wider knowledge, skills, broader experience and intellect. This observed relationship may be due to the fact that Bangladeshi listed banks have a less controlled environment and the audit committees worked under the pressure of management. Consequently, there is less opportunity of audit committee members to exploit their varied knowledge, skills and broader experiences. This circumstance made audit committees, irrespective of its size, unimportant in reducing NPLs.

In line with the hypothesis, we demonstrate that the scenario of NPLs in Bangladeshi listed banks improved as the number of audit committee meetings increased. The significant influence clarifies and strengthens the reasoning of Zgarni et al. (2018) in that banks holding frequent audit committee meetings are expected to reduce non-performing loans. A possible explanation for this relationship might be that the audit committee may have invested a substantial amount of time and energy to perform their functions by holding frequent audit committee meetings. As a result, credit risks remained under surveillance regularly and thus NPLs reduced.

The most noticeable outcome to emerge from the analysis is that the audit committee meetings contributed to reducing NPLs while the audit committee size did not. These results were to some extent counter-intuitive. This is because these findings did not validate theoretical arguments that audit committee size and its meetings are interconnected attributes as the number of audit committee meetings increased when the audit committee size became larger. The BSEC recommended holding 4 audit committee meetings and forming a committee with 3 members. The descriptive statistics reported that listed banks held an average of 10 meetings and the average audit committee size was 4.37 (members) in a financial year. These statistics showed no positive correlation between audit committee size and frequency of audit committee meetings as banks held more meetings, despite having a small audit committee size in those banks. This inconsistency may be due to weak enforcement of the code of corporate governance in Bangladesh.

Per the results, we document that increase of independent members in audit committees would lead to a reduction of NPLs. This finding conforms to those of Ali (2018) and Al Zobi et al. (2019). It can thus be suggested that the inclusion of a large number of independent members in an audit committee is beneficial for listed Bangladeshi banks as it reduced the level of NPLs or improved the quality of loan portfolios. A possible explanation is that independent members of the audit committee adequately monitored a bank's financial reporting, its related internal controls and risks that decreased the agency problem related to granting loans fraudulently; thus, reducing NPLs.

In contrast to the hypotheses, financial literacy and financial experience of audit committee members, and professional qualifications of the audit committee Chairman were found to be non-contributory audit committee attributes for improving the quality of NPLs. The result concerning financial literacy of the audit committee members and NPLs was contrary to those of Krishnan and Lee (2009) and Abubakar et al. (2015), who found that financial literacy of audit committee members reduces NPLs. Regarding the evidence on the financial experience of audit committee members and NPLs, the result contrasted with that of Zhang et al. (2007) who provided evidence of lowering non-performing loans if audit committee members are equipped with financial experience. Another finding is that there was the

non-contributory effect of professional qualification of the audit committee Chairman on non-performing loans. This outcome is contrary to the justification of the Bangladesh Enterprise Institute (2004) and Speklé (2012).

Moving on now to the impact of control variables on NPLs, we found that NPLs of older banks to be higher. This result is consistent with that of Pradhan et al. (2019). This outcome may be explained by the fact that, with more age, banks' total amount of loan disbursement increases, which raises the possibility of lending money to weak borrowers, consequently increasing the amount of loan defaulters. As far as bank size-NPLs relationship is concerned, we saw that large banks were competent in reducing NPLs-compared to small banks. This result reflected those of Misra and Dhal (2010) and Hu et al. (2004) who also found a negative effect of bank size on NPLs. The fact can be explained in line with the reasoning of Hu et al. (2004) that large banks reduced NPLs by using their large volume of resources and wider experiences that facilitate to put in place a strong internal control of assessing credit applications carefully. Consistent with Boudriga et al. (2010), Khan et al. (2019) and Khan et al. (2020), we document that a higher rate of return on assets enables banks to reduce NPLs. It seems possible that the result is due to banks with a high rate of return on assets are not under stress to increase income by any means; consequently, they ignored risky investment projects.

Our study failed to provide unequivocal evidence that GDP growth is a determinant for reducing NPLs in listed banks in Bangladesh. This result goes against the standpoint of Baboucek and Jancar (2005), Keeton and Morris (1987), Lee et al. (2020) and Fiador and Sarpong-Kumankoma (2020) who found a low volume of NPLs as GDP grew. Interest rate was not found to be a contributing factor that facilitated to reduce NPLs. This result contrasts those of Castro (2013) and Tarchouna et al. (2017), who documented that interest rate explained the level of NPLs. The non-contributory role of GDP growth and interest rate in reducing NPLs suggested that the economic condition of Bangladesh did not explain the capacity of borrowers to pay back principals and interests.

CONCLUSION

In this paper, we examined whether various attributes of the audit committee (audit committee size, frequency of audit committee meetings, audit committee independence, financial experience and literacy of the audit committee members, and professional qualification of the audit committee Chairman) in listed banks in Bangladesh explain the level of NPLs. We used a panel data set comprising all 30 listed banks with 250 bank-year observations for the period 2013–2017. We found that holding audit committee meetings frequently and including a higher number of independent members in the audit committee facilitated in reducing NPLs. Based on these findings, we conclude that banks should hold an optimum number of audit committee meetings and include a maximum number of independent members in the audit committee. By doing so, members of the audit committee will be able to reduce the risks of fraud loans by ensuring regular surveillance and they will also be able to watch over bank's financial reporting, its related internal controls and risks to reduce the agency problem related to granting loans fraudulently; consequently, NPLs will go lower. We, however, found no explicit evidence that the other attributes of the audit committee (audit committee size, financial experience and financial literacy of the audit committee members, professional qualifications of the audit committee Chairman) to be contributing factors for reducing NPLs in listed banks in Bangladesh.

The findings will be of interest to the banking sector of the country as some of the audit committee attributes examined were found to be sub-optimal. These sub-optimal attributes need to be modified to enhance accountability and transparency in banking activities, especially in credit management. Specifically, the findings will be useful for policymakers of the banking sector in Bangladesh and the relevant regulatory bodies in enabling them to understand the role of the various attributes of audit committees in minimising the incidence of NPLs. This is particularly important because the Bangladeshi economy is typically bank-based such that any calamity in the sector caused by NPLs could lead to economic disaster.

This study is not free from limitations. We considered a limited number of attributes of the audit committee as determining factors of NPLs in listed banks in Bangladesh. Another potential problem is that we considered a

short period from 2013 to 2017. To conduct a more in-depth analysis, future studies could, therefore, consider more data sets and attributes as elements of NPLs. More economic factors, along with bank-specific variables as determinants of NPLs, may also be considered.

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