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Impact of Corporate Governance on Non-Performing Loans of Commercial Banks in Bangladesh

Abstract

The paper investigates the nexus between corporate governance and the levels of non-performing loans (NPL) of commercial banks in Bangladesh based on the sample of 10 private commercial banks for 10 years covering from 2012 to 2021. A number of econometric models such as pooled OLS, fixed effect, random effect, cross-sectional GLS, and one-step system GMM approach were employed in our analyses. From the observed estimated coefficients, the availing of credit rating from the three renowned credit rating agencies had a significant negative impact on non-performing loans under pooled OLS, GLS, and random effect. Board size had a significant negative relationship under GLS while bank size had a significant positive influence. Institutional ownership had a significant negative influence and government ownership had a significant positive influence under the fixed effect model. From the estimated coefficients observed from the one-step system GMM, only director's ownership is significantly lessening non-performing loans, while board meetings and stock-exchange listed banks had a significant positive impact. All other coefficient values under the one-step GMM estimation except for government ownership and employment of big four affiliated auditors as external auditor was found to adhere to our hypothesized impact.

1. Introduction

Corporate governance refers to the systems, policies, and processes organizations use to direct and control what they do to achieve their goal. Simply stated, it is a set of rules that enable corporations to pursue their goals while carrying out operations with fairness, responsibility, accountability, and transparency. Corporate governance came to the forefront of attention in developed countries following the global financial crisis as it has been a vital tool in recovering public confidence. Bangladesh has also seen increased attention towards corporate governance after the Bangladesh Securities and Exchange Commission (BSEC) updated its "Code of Corporate Governance (2006)" in 2012 to better tackle the shock of the 2010 stock market crash.

Several empirical research was carried out which examined the consequences of corporate governance on firm performance in Bangladesh (Habib, 2016; Imam and Malik, 2007; Rouf, 2011). In addition, many research specifically looked at the impact of corporate governance on the performance of banks operating

in Bangladesh where many of the components of corporate governance were observed to have a significant influence on bank performance both individually and overall (Muttakin and Ullah, 2012; Hoque, Islam and Ahmed, 2013; Rahman and Islam, 2018; Islam, Sathye and Hu, 2015; Rashid, Zobair, Chowdhury and Islam, 2020). However, very few investigations have explored the relationship between corporate governance and NPL of commercial banks in Bangladesh. The persistence of non-performing loans in the banking sector of Bangladesh has greatly hampered economic development. Non-performing loans are generally unwanted as it leads an economy into an inefficient state which significantly lessens economic output and growth (Brownbridge and Harvey, 1998; Burgstahler, Hail and Leuz, 2006). Corporate governance is observed to have a significant influence on the non-performing loans of banks in developing economies (Ahmad, Guohui, Hassan, Naseem and Rahman, 2016; Nyor and Mejabi, 2013; Balagobei, 2019; Irawati, Maksum, Sadalia and Muda 2019; Lestari, 2018; Poudel and Hovey, 2012). Khatun and Ghosh (2019) examined the impact of corporate governance on the level of non-performing loans of the listed commercial banks of Bangladesh and observed it to significantly affect non-performing loans. Akter, Hossain, Alamand Islam (2021) examined the attributes of audit committees in explaining non-performing loans, which itself is one of many attributes of corporate governance. Sen, Abedin, Hossain and Ghosh (2022) studied the impact of audit committee independence, audit quality, director ownership, bank size, and CEO power on non-performing loans of the banks in Bangladesh. An efficient structure of corporate governance while considering the impact of corporate

governance attributes would improve the overall effectiveness of corporate governance while enabling the PCBs in Bangladesh to better manage the quality of their loans advanced to ensure the levels of non-performing loans remain manageable.

Considering this background, this study contributes to the literature as follows. First, we provide evidence on the expected impact of corporate governance attributes on the non-performing loans of the commercial banks of Bangladesh to determine the overall significance of the influence of corporate governance on non-performing loans. Most prior studies considered only a few elements of corporate governance but didn't consider the attributes that make up those elements. Furthermore, the ownership structure of the banks wasn't considered, which greatly influences corporate governance as majority shareholders would be keener on monitoring managerial efforts in contrast to minority shareholders. (Zhuang, 1999). The availing of credit rating from the big three credit rating agencies as a practice of corporate governance and its impact on non-performing loans is also looked at, which hasn't been done before for private commercial banks in Bangladesh to the best of our knowledge. This study employs pooled ordinary least squares (OLS), random effect, fixed effect, and generalized least-squares (GLS) regression in the estimation of the coefficient values of the variables considered in the study as well as employing the one-step system GMM standing for generalized method of moments estimation technique to account for heteroskedasticity and endogeneity in the panel data. This study would enable a greater understanding of the influence of corporate governance on the non-performing loans observed by the

private commercial banks operating in Bangladesh.

The following segments of this paper consist of reviewing the literatures, developing our hypotheses, stating the methods adopted in carrying out the investigation, discussing the findings and concluding this empirical investigation.

2. Literature Review and Hypothesis Development

2.1 Board Size

Ahmad et al. (2016) explored the relationship between non-performing loans and corporate governance for every category of ownership in the banking sector of Pakistan from 1996 to 2007 and observed a direct relationship between board size and non-performing loans. This is consistent with the findings of Agoraki et al.(2010) and Bussoli et al. (2015) who opined that the increase in the size of a bank's board of directors leads to an overall inefficiency of the bank's board which influenced the overall quality of loans to deteriorate due to inefficient monitoring, which results in the increase of non-performing loans. Khatun and Ghosh (2019) conducted a similar study on the private commercial banks of Bangladesh and documented increased non-performing loans with the increase in Board Size. However, Francis et al. (2012) documented the increase in loan quality with the increase of members in the banks' boards, provided that the board works with independence. Organizations tend to prefer large board sizes as it enables the top management to have a wide array of expertise to ensure proper advice and guidance in navigating different sectors (Boone et al. 2007). According to Nath et al. (2015), it is beneficial to keep the board size small as it enables the board

members to gather on short notice in case of emergencies which makes it easier for them to reach a consensus on decisions. This is in agreement with the findings of Fama and Jensen (1983) where who stated that though having a large board size makes it difficult for the board to be influenced by the management for their goals, too large of a board size result in the board losing its effectiveness and coordination. Having the board size small makes it easier for the board members to be held accountable, but it increases agency problem. Topak (2011) argued that the board's size doesn't have an influence on a bank's performance, asthe experience and skill set of the board members can impact the overall performance of a bank. However, Ahmad et al. (2016) found that the board size was inversely related to NPLs for the commercial banks of Pakistan. Based on this background, this paper assumes-

H_1: There is a significant negative impact of board size on non-performing loans.

2.2 Number of Board Meetings

Poudel and Hovey (2013) conducted a regression analysis on the private commercial banks operating in Nepal from the period 2005 to 2011 and found that a higher number of board members coupled with low board meeting frequency yielded improved efficiency for the banks. This is consistent with the findings of Tahir, Shah, Sayal and Afridi (2020) in their study on the impact of corporate governance on the loan quality of commercial banks in Pakistan. However, the number of the board meeting was found to negatively impact non-performing loans for the US commercial banks from the period 2002-2015 according to the study by Islam (2020) which was supported by the findings of Adegboye, Ojeka and

Adegboye (2020) for the commercial banks in Nigeria. Therefore, this paper hypothesizes that-

H$_2$: There is a significant negative impact of the number of board meetings on non-performing loans.

2.3 Independent Directors

The presence of independent directors on a bank's board has been observed to reduce the overall risk of banks and improve bank performance as they are often more skilled than existing board members, reduce agency problem by working more for the shareholders' interest and enjoy greater independence due to them having no ownership interest with the banks (Brickley and Zimmerman, 2010; El-chaarani, 2014; Alves, 2014). But, the studies of Hermalin and Weisbach (1991) and Kiel and Nicholson (2003) found that the number of independent directors has no impact on the overall firm performance. Khatun and Ghosh (2019) observed the non-performing loans of private commercial banks to increase as the number of independent directors increased which was contrary to their hypothesized impact. Therefore, this paper formulates the following hypothesis-

H$_3$: There is a significant negative impact of independent directors on non-performing loans.

2.4 Institutional Ownership

Chung et al. (2011) recommended having a higher percentage of institutional ownership as institutional owners are often more knowledgeable, skilled, resourceful, and have greater access to information all of which translate to increased firm performance and efficiency. However, both Charfeddine and Elmarzougui (2010) and

Fehr (2016) opined against having large institutional ownership as they are likelier to be in close association with the top management which would result in them approving decisions that are in the interest of management but in the detriment of the overall firm. Thus, this paper expects-

H$_4$: There is a significant negative impact of institutional ownership on non-performing loans.

2.5 Foreign Ownership

As per Kalsie and Shrivastav (2017), the increase in foreign ownership in the overall ownership structure of the firm is beneficial for the firm as it is linked with the reduction of agency cost. Phung and Le (2013) opined contrarily, stating that foreign investors often have limited access to information to have a significant influence on firm performance. Thus, this paper hypothesizes that-

H$_5$: There is a significant negative impact of foreign ownership on non-performing loans.

2.6 Director Ownership

Amuakwa-Mensahand Boakye- Adjei (2015) studied the effect of director ownership on the level of non-performing loans of the private commercial banks of Ghana. Banks with a high level of director ownership exhibited reduced level of non-performing loans as they exhibited efficient management. Directors with high ownership are likelier to work harder on their managerial and monitoring activities and ensure greater standards are held in loan monitoring and advancement, which impacts loan quality positively and reduces overall levels of non-performing loans. This is consistent with the findings of Sarker and Sarker (2000), as they found

that director ownership over a certain level increases company value. Akwa-Sekyi et al. (2015) in their study on the commercial banks of Europe observed higher director ownership to significantly reduce non-performing loans. Sen et al. (2022) studied 29 listed commercial banks in Bangladesh from 2005 to 2018 and found that banks availing the services of big four audit firms and director's ownership had a significant negative relationship with non-performing loans. Therefore, this paper assumes-

H$_6$: There is a significant negative impact of director's ownership on non-performing loans

2.7 Government Ownership

Lannotta et al. (2007) examined over 181 banks from Europe over a five-year period from 1999 onwards and found that banks with high government ownership tend to have decreased loan quality, which results in an increase in the probability of loans turning non-performing. Sapienza (2004) found that banks' lending behavior is significantly impacted by the amount of government ownership in their ownership structure. These banks tend to charge a lower interest rate on loans advanced to parties with strong political affiliations. These loans have a lower probability of being repaid. Given this background, this paper hypothesizes-

H$_7$: Government ownership increases non-performing loans of Banks.

2.8 Bank Size

As per Keeton and Morris (1987) managers of banks with small sizes tend to advance riskier loansin order to increase profitability, which tends to increase the non-performing loans of the bank. On the other hand, Rajan (1994) argued that banks

with high capital which are considered "too big to fail" are more likely to get bailed out during any financial crisis, which leads to more lenient lending policies, which tends to increase the likelihood of loans turning non-performing. Based on this, this paper provides the following hypothesis-

H$_8$: There is a significant positive impact of bank size on non-performing loans.

2.9 Audit Committee Size and Number of Audit Committee Meetings

Wiseman et al. (2012) described the audit committee as an essential tool for corporate governance which works to reduce agency cost and information asymmetry while establishing greater internal control mechanisms. Herdjiono and Sari (2017) stated that the presence of a qualified audit committee enhances the quality of a firm's financial records. Raghunadan and Rama (2007) reasoned that the frequency of audit committee meetings is likelier to increase with the increase of audit committee members. Mollah et al.(2012) stated that a large number of members in the audit committee is preferable as the bigger the size of the committee, the more likely it is to have members with diverse knowledge, experience, skill set, and expertise, which was further supported by Poudel and Hovey (2012)**.** According to Zgarni et al. (2018)**,** the increase in audit committee size is significantly related to the decrease in credit risk as all credit activities come under greater scrutiny and surveillance due to it. However, the study by Akter et al. (2021) found that frequent holding of audit committee meetings had a significant impact on the reduction of the NPLs of the listed banks in Bangladesh and no evidence was found that the size of the audit committee had an impact in reducing non-performing loans. Therefore, this

paper assumes the following hypotheses-

H$_9$: There is a significant negative impact of audit committee size on non-performing loans.

H$_{10}$: There is a significant negative impact of the number of audit committee meetings on non-performing loans.

2.10 Stock Exchange Listed

The lending behavior of the listed commercial banks in Malaysia was analyzed by Mansor H. Ibrahim (2006) where it was found that bank loans react positively to increases in stock price. This was further supported by Saud Almutair (2015) who observed a positive relationship between bank loans and stock price rise, stating the rise in stock prices influenced the supply and demand of bank loans. The increase in bank loans has been found to also increase levels of non-performing loans (Ahmad and Bashir, 2013). However, Boudriga et al. (2010) found the levels of non-performing loans to decrease with high credit growth, stating that banks that focus on their lending activities are greatly skilled at ascertaining the true credit quality of the borrowers. Based on this background, this paper assumes-

H$_{11}$: Banks listed on the stock exchange have a positive influence on non-performing loans.

2.11 Big Three Credit Rating Agency

The giant three global credit rating agencies provide ratings based on a thorough assessment of a bank's credit profile. In addition to that, the agencies also provide technical advice and assistance which makes use of their expertise working on similar markets all over the globe. The study by Boumparis et al. (2019) found

that downgrades in sovereign ratings (provided by the big three credit rating agencies) decisions cause downgrades in bank ratings, reducing lending supply and increasing the burden of re-financing existing loans, resulting in an increase in non-performing loans. This is providing significant evidence of the relationship between bank rating and non-performing loans. However, the banks that avail credit rating services from such credit rating agencies should be able to manage their risk better with aid from the information acquired from the big three credit rating agencies. So, this paper hypothesizes that-

H$_{12}$: There is a significant negative impact of the big three credit rating agencies on non-performing loans.

2.12 Big Four Auditor/ Audit Quality

The role of external auditors in reducing information asymmetry was discussed by Jensen and Meckling (1976) as external auditors are able to provide stakeholders with proper assurance about the reliability and accuracy of the financial reports prepared by commercial banks. Management with "High corporate ethical values" are more likely to hire the services of big four audit firms (Hoque et al. 2015). Lin and Liu (2009) stated that firms with shaky internal governance mechanisms are more likely to avail the services of inferior audit firms. Sen et al. (2022) found that the availing of the services of the big four audit firms had a significant negative impact on the non-performing loans of the listed banks in Bangladesh. Therefore, this paper provides the following hypothesis-

H$_{13}$: There is a significant negative impact of big four audit firms on non-performing loans.

3. Data and Methods

This is an explanatory research of quantitative nature to explain the impacts of the corporate governance attributes of the private commercial banks of Bangladesh on their levels of NPL. This study consists of panel data through the acquisition of relevant secondary data from the annual report published by ten private commercial banks covering from the year 2012 to 2021 yielding a sample size of 100. All of the annual reports were available on the banks' official website. Several prior studies used similar data for this type of research (Khatun and Ghosh, 2019; Akter, Hossain, Alam and Islam, 2021; Sen, Abedin, Hossain and Ghosh, 2022). Following Table 1 describes the key research variables that are considered in the study.

Table 1: Description of Variables included in the model

Explained Variables	Notation	Measurement Method	Expected Impact	References	Data Source
Dependent Variable					
Non-Performing Loans	NPL	Non-Performing Loans/ Total Loans and Advances	n/a	(Khatun and Ghosh, 2010; Akter et al., 2021; Sen et al., 2022)	Annual Report
Independent Variables					
X_1= Board Size	BDsize	The number of directors on the Bank's Board	Negative	(Khatun and Ghosh, 2019; Ahmad et al., 2016; Agoraki et al., 2010) (Maria et al.,2017)	Annual Report
X_2= Independent Directors	ID	The number of Independent Directors on the Bank's Board	Negative	(KhatunandGhosh, 2019) (Brickleyand Zimmerman, 2010; El-Chaarani, 2014; Alves, 2014)	Annual Report
X_3= Board Meetings	BDmeet	The number board meetings in each year	Negative	(Poudeland Hovey, 2013; Tahir et al., 2020) (MdNurul Islam, 2020; Adegboye et al., 2020)	Annual Report
X_4= Audit Committee	AUD	The number of members on the bank's audit committee	Negative	(Zgarni et al., 2018; Mollah et al., 2012)	Annual Report
X_5= Audit Committee Meetings	AUDmeet	The number of meetings of the audit committee each year.	Negative	(Akter et al., 2021)	Annual Report
X_6= Director 's Ownership	Dir Own	The percentage of shares owned by the banks' board of directors	Negative	(Sen et al., 2022; Adjei-Mensah et al.,2015)	Annual Report
X_7= Institutional Ownership	Ins Own	The percentage of shares owned by institutional investors	Negative	(Chung et al., 2011) (CharfeddineandElmarzougui, 2011; Fehr, 2016)	Annual Report
X_8= Government Ownership	Gov Own	The percentage of shares owned by the government/government representatives	Positive	(Lanotta et al., 2006; Sapienza, 2004)	Annual Report
X_9= Foreign Ownership	For Own	The percentage of shares owned by foreign investors	Negative	(Kalsie and Shrivastav, 2017) (Phungand Le, 2013)	Annual Report

X_{10}= Bank Size	SZ	Log of Total Assets	Positive	(Keeton and Morris, 1987) (Rajan, 1994)	Annual Report
X_{11}= DSE Listed	DSElist	0 if the bank is not listed on the Dhaka Stock Exchange, 1 if otherwise	Positive	(Mansor H. Ibrahim, 2006; Saud Alamutair, 2015) (Boudriga et al., 2010)	Annual Report
X_{12}= Big Three Credit Ratings	BigThree	0 if the bank did not avail credit rating services of the big three global credit rating agencies, 1 if otherwise	Negative	(Bounparis et al. 2019)	Annual Report
X_{13}= Big Four Auditor	BigFour	0 if the bank's financial statement is audited by a big 4 audit firm, 1 if otherwise	Negative	(Sen et al., 2022)	Annual Report

Source: Author's Contribution

In this table 1, the corporate governance attributes are listed under the independent variables while the dependent variable of our study is non-performing loans, which is measured by non-performing loans/ total loans and advances. It is the percentage of total loans and advances that are classified as non-performing loans.

The following empirical models have been constructed in order to analyze the impact of corporate governance components on the non-performing loans of private commercial banks in Bangladesh:

$$NPL_{it} = \alpha_{it} + \sum_{k=1}^{13} \text{\ss}_{it} \ X_{itk} + u_{it} \qquad \text{……..(i)}$$

$$NPL_{it} = \alpha_{it} + \sum_{k=1}^{13} \text{\ss}_{it} \ X_{itk} + \varepsilon_{it} + u_{it} \qquad \text{……..(ii)}$$

$$NPL_{it} = \alpha_{it} + \lambda NPL_{i(t-1)} + \sum_{k=1}^{13} \text{\ss}_{it} \ X_{itk} + u_{it} \qquad \text{……..(iii)}$$

Here, α_{it}, = Constant of the model, **NPL** = Non-performing loans; ΣX = All explanatory variables adopted in the model; β = Coefficient of the explanatory variables; u_{it}= Error term of the model/ Error term within the entity; ε_{it}= Error term among the entities; λ= Coefficient of the lagged dependent variable; **NPL$_{i(t-1)}$**= One Year Lagged NPL variable.

The fixed effect method assumes that the constant term is time invariable and that

some factors within the banks will be affecting our independent variables which will result in biasedness in the result along with the correlation between the error terms of the independent variables. The random effect method assumes that the error variance between the entities (Private Commercial Banks) is random and they are uncorrelated with the regressors of the model. This endogeneity problem is addressed through the usage of the One-Step GMM method which estimates the coefficients in an unbiased and efficient way. Equation (i) is used to estimate the model using Pooled OLS, Fixed Effect and Generalized Least Square (GLS) Method followed by equation (ii) and (iii) are used for estimating the coefficients using Random Effect and GMM approach respectively.

4. Empirical Results with Discussion

Following Table 2 summarizes the descriptive statistics of the variables of the model which enable us to ascertain their statistical properties. The standard deviations of each variable are relatively low barring board size and board meetings, which showed comparatively high deviations. The gaps in ranges were found to be moderate.

Table 2: Descriptive Statistics

Variables	Mean	Median	Standard Deviation	Minimum	Maximum
Non-Performing Loans	0.0539	0.0478	0.0368	0.022	0.3307
Board Size	12.66	12	4.1297	5	22
Independent Directors	0.2271	0.2052	0.1010	0.0769	0.7
Board Meeting	20.19	20	5.6204	8	33
Audit Committee	4.12	4	1.0943	2	8
Audit Committee Meeting	9.59	9	3.6875	3	24
Director's Ownership	0.3794	0.3922	0.1409	0.0411	0.6
Institutional Ownership	0.1808	0.1788	0.1083	0	0.5705
Government Ownership	0.0333	0	0.0985	0	0.3275
Foreign Ownership	0.0108	0.0024	0.0175	0	0.0831
Bank Size	11.3980	11.4201	0.1563	10.9838	11.7113
DSE Listed	0.9	1	0.3015	0	1
Big Three Credit Rating Agency	0.19	0	0.3942	0	1
Big Four Auditor	0.55	1	0.5	0	1

Source: Author's contribution based on STATA

Table 3 in the next page presents the results derived from the estimation of coefficients from the various models considered in this study. Board size was found to have negative impact non-performing loans under pooled OLS, random effect and GLS model with the GLS coefficient being significantly negative under a 10% level of significance suggesting that as the size of the bank's board increases, the level of NPLs decreases, which conforms to the findings of Maria et al. (2017) for a similar study done on the listed commercial banks of Pakistan. This is because a larger board typically brings together individuals with diverse backgrounds and expertise. This diversity can lead to more comprehensive and well-rounded decision-making, particularly in assessing and managing credit risks. Moreover, with more directors, there's a greater capacity for monitoring and oversight, which can lead to better management of loan portfolios and a reduction in risky lending practices. In addition, A larger board may

lead to increased accountability and better internal controls, as there are more board members to answer to and more scrutiny of decisions and policies. However, it was found to have positive impact on non-performing loans under fixed effect and one-step system GMM estimation, which is in line with the findings of Khatun and Ghosh (2019) in their prior study on private commercial banks in Bangladesh and the findings of Ahmad et al. (2016) and Agoraki et al. (2010) based on similar research. The explanation behind this relationship is that in a larger board, individual accountability may diminish. This phenomenon, known as "diffusion of responsibility," can lead to less rigorous oversight of lending decisions, as the responsibility is shared among more members. Larger boards may face challenges in reaching consensus, leading to slower decision-making processes. This can be detrimental in dynamic market conditions where quick and decisive action is needed, potentially leading to

missed opportunities for addressing or mitigating risks in the loan portfolio. In addition, while having a range of expertise is generally beneficial, too much diversity in terms of professional backgrounds and perspectives can lead to a lack of cohesive strategy in managing credit risk and NPLs. Sometimes, a larger board might engage in more aggressive strategies to justify their existence or to showcase their effectiveness, leading to riskier lending practices.

Table 3: Summary of the output of the estimated coefficients based on equations (i), (ii) and (iii)

Explained Variable (NPL)		Estimation of Coefficients				
		Pooled OLS	Random Effect	Fixed Effect	GLS	One Step System GMM
Explanatory Variables	L. Non-Performing Loans (One Year Lagged)					**0.5224****
	Board Size	-0.0026	-0.0026	0.0010	**-.00265***	0.0019
	Independent Directors	-0.0657	-0.0657	0.0688	-0.0657	-0.1153
	Board Meetings	0.0009	0.0009	-0.0005	0.0009	**0.0032***
	Audit Committee	0.0003	0.0003	-0.0073	0.0003	-0.0050
	Audit Committee Meetings	-0.0015	-0.0015	-0.0008	-0.0015	-0.0013
	Director's Ownership	-0.0192	-0.0192	0.0585	-0.0192	**-0.4641***
	Institutional Ownership	0.0912	0.0912	**-.17429***	0.0912	-0.2806
	Government Ownership	-0.0519	-0.0519	**0.3187***	-0.0519	-0.3252
	Foreign Ownership	0.0312	0.0312	-0.0957	0.0312	-0.0826
	Bank Size	0.0508	0.0508	-0.0068	**.05085***	0.0017
	DSE Listed	0.0245	0.0245	0.0149	0.0245	**0.2208***
	Big Three Credit Rating Agency	**-.02798***	**-.02798***	-0.0032	**-.02798***	0.0324
	Big Four Auditor	0.0136	0.0136	0.0104	0.0136	0.0092
	Constant	-0.0003	-0.5150	**-10.6024***	-0.5150	0.0040
Observations		100	100	100	100	90
R2		0.2013		0.2490		
F		13.70		11.89		
Chi2			21.67686		25.2056	294.1973
Sigma_e			0.027929	0.0279		
Sigma_u			0	329.4861		
rho			0	0.9999		

Source: Author's estimation based on STATA. Note:*, **, *** designate the level of significance at 10%, 5% and 1%respectively.

The percentage of independent directors on the banks' board of directors negatively influenced non-performing loans in all models except the fixed effect model. As Independent directors are not part of the bank's management and typically don't have any financial or other material relationships with the bank that could influence their decisions, this objectivity allows them to provide unbiased oversight of the bank's operations, including its lending practices. Moreover, Independent directors often bring specialized expertise and experience from outside the banking industry. This can include knowledge in areas like risk management, finance, law, and corporate governance, which can be invaluable in guiding the bank's strategies and policies related to loan administration and NPL management. With their external perspectives, independent directors can contribute to more effective risk management practices. They can challenge internal assumptions and push for rigorous risk assessment and mitigation strategies, which can help in reducing the risk of loans turning non-performing. As a consequence, Independent directors can hold management more accountable for their decisions and actions, including those related to lending. This can lead to more prudent and responsible loan approvals, thereby potentially reducing the incidence of NPLs. This is consistent with the findings of Brickley and Zimmerman (2010), Chaarani (2014), and Alves (2014) based on similar research although the influence wasn't statistically significant.

The number of board meetings was found to have a significant positive relationship with non-performing loans based on the one-step system GMM estimation and an insignificant positive relationship under all of the other models except the fixed effect model. This postulates that more frequent meetings can lead to decision fatigue among board members, affecting their ability to make well-considered decisions. This might impact the quality of decisions related to credit policies and risk management. In addition, If board meetings are held too frequently, there might be a tendency to focus on short-term operational issues at the expense of long-term strategic planning. This short-term focus can lead to inadequate attention to long-term risk management, including the assessment and monitoring of loan portfolios, potentially increasing NPLs. Excessive meetings can lead to an operational overload for both board members and management. This could result in inadequate preparation or insufficient time for thorough analysis and discussion of key issues, including the management of loan portfolios which is also observed in the studies of Poudel and Hovey (2013) in their research on Nepalese commercial banks and Tahir et al. (2020) in their research on the Pakistani banking sector. Thus providing adequate grounds to lessen the high frequency of board meetings is to ensure efficiency.

The number of members on the banks' audit committee was found to negatively influence non-performing loans under the one-step system GMM estimation due to several reasons such as with more members, the audit committee can conduct more thorough and diligent oversight of the bank's loan portfolio and risk management practices. This increased oversight can help identify potential issues early and prevent loans from becoming non-performing. Moreover, a larger audit committee can strengthen governance and accountability within the bank. More members ensure that decisions are

scrutinized from various angles, leading to more prudent and well-considered approaches to loan approvals and risk management. These findings are also espoused by similar studies of Zgarni et al. (2018) and Mollah et al. (2012). However, the impact wasn't found to be statistically significant in our investigation. Another determinant of corporate governance is the number of audit committee meetings which was found to minimize non-performing loans under each of the models. Frequent audit committee meetings allow for more regular and detailed oversight of the bank's risk management practices. This includes closer monitoring of the bank's credit portfolio and ensuring that proper risk assessment procedures are followed for loan approvals. Moreover, with more meetings, the committee can identify and address issues related to loan performance and risk exposure more promptly. Early detection of problems in loan portfolios allows for quicker corrective actions, potentially reducing the volume of NPLs. In addition, regular meetings facilitate continuous evaluation and strengthening of internal controls related to lending practices. Effective internal controls are crucial in preventing and detecting risk factors that lead to increased NPLs. This was also observed by Akter et al. (2021) on their study on the effects of number of audit committee meetings on the non-performing loans of the commercial banks of Bangladesh. In addition, their study also found the impact to be significantly negative.

Director's ownership, defined by the percentages of the total shares of a bank held by the banks' board of directors was found to have the highest reducing influence on non-performing loans under the one-step system GMM model at 10%

level of significance. It was also found to have a negative impact on all models except the fixed-effect regression model. The recent study of similar nature by Sen et al. (2022) also reported a significant negative relationship between director ownership and non-performing loans for the private commercial banks of Bangladesh. This provides additional evidence to the arguments of Adjei-Mensah et al. (2015) where they called for the increase of director ownership which would enable greater accountability and vigilance from the board of directors to uphold corporate governance practices to ensure that the banks operate with efficiency. In fact, when directors own a larger portion of the bank, their financial interests are more closely aligned with the bank's success. This alignment incentivizes them to make decisions that are beneficial for the bank's financial health including the reduction of NPL. Higher ownership can shift the focus of directors from short-term gains to the long-term health of the bank. This long-term perspective is crucial in developing strategies that ensure sustainable growth and minimize the risk of bad loans.

The percentage of shares owned by institutional investors was found to be in a negative relationship with non-performing loans under the one-step system GMM and a significant negative relationship under the fixed effect regression model. This is because the involvement of respected institutional investors can signal confidence in the bank's management and operations. This can have a positive effect on the bank's reputation and operational practices, indirectly reducing the risk of loan defaults. Unlike individual investors, institutional investors are often more interested in long-term stability and sustainable returns. This

perspective encourages banks to focus on long-term profitability rather than short-term gains, promoting healthier lending practices. Moreover, Institutional investors are typically well-versed in regulatory requirements and standards. Their influence can ensure that the bank adheres to high standards of compliance and risk management, which is crucial in maintaining a healthy loan portfolio. This is consistent with the findings of Elmarzougui (2011) and Fehr (2016).

The percentage of shares held by the government was also found to have negative impact on non-performing loans under all regression models except in fixed effect regression model, where a significant positive impact was seen. The reason behind this negative impact is that Government-ownership in banks is typically subject to stringent regulatory oversight. This can result in more conservative and prudent lending practices, reducing the likelihood of loan defaults. Moreover, the presence of government ownership can enhance the bank's credibility, potentially attracting more stable and low-risk customers. This perception of stability and reliability can translate into a healthier loan portfolio. Further, Government involvement can provide banks with better access to information, resources, and expertise, aiding in more informed lending decisions and effective risk management strategies. However, the negative coefficient value of government ownership is contradictory to the findings of Lanotta et al. (2006) and Sapienza (2004). The percentage of shares held by foreign investors was found to reduce the levels of NPLs which is in line with the findings of Phung and Le (2013). This is because foreign ownership can strengthen corporate governance by introducing international standards and practices. Better governance can lead to more transparent and prudent lending decisions, thus minimizing NPLs. Foreign ownership can provide access to international financial networks and markets. This expanded access can improve the bank's financial stability and diversification, indirectly helping in managing and reducing NPLs. The influence of foreign owners can bring diverse management practices, leading to a more dynamic and adaptable approach in banking operations, including the management of loan portfolios.

This study observed a significant positive relationship between bank size and non-performing loans under the GLS regression model and all of the other models exhibited an insignificant but positive association barring the coefficient value derived under the fixed effect coefficient model. This conforms to the arguments of Keeton and Morris (1987) where bigger banks tend to advance riskier loans in search of greater profit. Moreover, larger banks often deal with complex and diverse portfolios. The sheer scale of operations can lead to challenges in effectively managing and monitoring every loan, increasing the risk of some loans turning non-performing. In addition, In pursuit of growth, large banks might extend credit more aggressively, sometimes compromising on the quality of credit evaluation. This can lead to a higher proportion of risky loans, which may turn into NPLs. Large banks are more exposed to systemic risks and economic cycles. During economic downturns, these banks might experience a significant rise in NPLs due to their extensive involvement in various market segments. Large banks may lack the localized, personalized approach to loan management and

customer relationships that smaller banks have. This impersonal approach can lead to less effective risk assessment and management on an individual loan basis.

A significant positive relationship was also observed with the stock-exchange listed banks and the level of NPLs under the one-step system GMM regression model. All of the other regression models also displayed a positive impact which can also be seen in similar studies by Mansor H. Ibrahim (2006) and Saud Alamutair(2015). This positive relationship demonstrates that listed banks are under constant pressure from shareholders and the market to show good financial performance. This pressure can sometimes lead to aggressive growth strategies, including liberal lending practices to boost loan portfolios, potentially increasing the risk of NPLs. Moreover, the need to compete effectively in the market can lead listed banks to lower lending standards to attract more customers, potentially increasing the volume of riskier loans that may become non-performing. Often, stock exchange-listed banks have large and diverse portfolios. Managing such vast portfolios efficiently can be challenging, leading to oversight issues and an increased risk of some loans becoming non-performing. In addition, to stay ahead in the market, listed banks might adopt newer, riskier financial products or services without fully understanding or mitigating their long-term risks, which can lead to increased NPLs.

The availing of credit rating from the big three credit rating agencies (Moody's, Standard and Poor's, and Fitch Group) was found to have a significant negative influence on non-performing loans under the pooled OLS, random and GLS regression models while an insignificant

negative influence was observed under the fixed effect model. This reveals that high credit rating banks often have stringent and robust credit policies. They conduct thorough credit assessments and due diligence before approving loans, which helps in filtering out high-risk borrowers and reducing the likelihood of defaults. High credit rating banks often have stringent and robust credit policies. They conduct thorough credit assessments and due diligence before approving loans, which helps in filtering out high-risk borrowers and reducing the likelihood of defaults. Such banks often adhere to high standards of regulatory compliance and governance. Good governance practices ensure responsible lending and effective oversight of loan portfolios.

The inclusion of Big Four affiliated audit firms as external auditors was found to have a positive influence on non-performing loans under all of the regression models, which is contradictory to the findings of Sen et al. (2022) where a significant negative relationship was reported. This positive relationship in our paper can be justified as external auditors primarily focus on compliance with accounting standards and regulations. This focus can lead banks to prioritize meeting audit requirements over improving their risk assessment and loan monitoring practices, potentially overlooking the growing risks in their loan portfolios. Moreover, preparing for and facilitating external audits can consume significant management time and resources. This diversion can lead to a temporary neglect of core banking functions such as credit monitoring and risk management, allowing the quality of the loan portfolio to deteriorate. In addition, the presence of an external audit firm may lead banks to be overly cautious and conservative, focusing

more on compliance and less on innovating in risk management and loan recovery strategies. This lack of innovation can hinder effective management of NPL for banks.

4.2.2 Random Effect (RE) vs. Fixed Effect (FE)

The Hausman test is a widely used statistical test in econometrics, specifically designed to compare the Random Effects

Table 4: Summary of Output of BP-LM Test

	VAR	SD= $\sqrt{(VAR)}$
NPL	0.0013	0.0368
e	0.0007	0.0279
u	0	
Chi^2	0	
P Value	1.00	

Source: Author's estimation based on STATA. OLS Model

H_0: Random Effect Model is not better than Pooled

4.2 Model Specification Tests

4.2.1 Random Effect vs. Pooled OLS

The Breusch-Pagan Lagrange Multiplier (BP-LM) test is used in econometrics to test for random effects in a panel data model. The test essentially compares a Random Effects model against a Pooled Ordinary Least Squares (Pooled OLS) model to determine which is more appropriate for the given data. Here's how the BP-LM test is conducted for this paper:

The LM statistic is compared with a critical value from the chi-square distribution. If the LM statistic is greater than the chi-square value, the null hypothesis of no random effects (i.e., the Pooled OLS model is appropriate) is rejected in favor of the alternative hypothesis that random effects are present, suggesting that a Random Effects model is more appropriate. The P value derived from the above Table 4 revealing the result of the BP-LM test is 1.00 which is higher than 0.10. This enables us to accept the null hypothesis and conclude that the Pooled OLS model is better than the

random effect model in our paper.

(RE) model with the Fixed Effects (FE) model in panel data analysis. This test helps in deciding whether the RE or FE model is more appropriate for a given dataset. Here's how the Hausman test is conducted: This Hausman test is adopted to determine the better model between the FE model and the RE model for this study. The calculated Hausman statistic is then compared with a critical value from the chi-square distribution. If the statistic is greater than the chi-square critical value, the null hypothesis (that the preferred model is the Random Effects model because the individual effects are uncorrelated with the other explanatory variables) is rejected. This suggests that the Fixed Effects model is more appropriate for the data. The resulting P value of 0.0306 in the following Table 5 lets us reject the null hypothesis concluding that the fixed effect model is better than the random effect model for this study.

Table 5: Summary of Hausman Test

Hausman Test	
Chi^2	4.6814
P-Value	0.0306

Source: Author's estimation based on STATA. H_0: Random Effect Model is better than Fixed Effect Model

4.3 Diagnostic Tests of estimated model

4.3.1 Test of Heteroskedasticity

Heteroskedasticity affects the reliability of the standard errors associated with the estimated coefficients in a regression model. Under heteroskedastic conditions, the standard errors can be biased, leading to incorrect conclusions about the statistical significance of the coefficients. Testing for heteroskedasticity helps in identifying whether the standard errors need to be adjusted to make valid inferences. In applied econometrics, especially in policy analysis and business decisions, relying on models without checking for heteroskedasticity can lead to suboptimal or incorrect decisions. Moreover, Identifying and addressing heteroskedasticity enhances the robustness of the model. It ensures that the model's predictions are reliable across different conditions and populations, which is especially important in diverse datasets. Following Table 6 displays the summary of the output of the wald test for heteroskedasticity. The P value for each of pooled OLS, fixed effect, and GLS models was found to be 0, which lets us reject the null hypothesis to conclude that each of those models suffers from the heteroskedasticity problem.

Table 6: Summary of the output of the Wald Test for heteroskedasticity

	Model		
	Pooled OLS	Fixed Effect	GLS
Chi^2	85.22	1462.59	2193.30
P Value	0	0	0

Source: Author's estimation based on STATA H_0: Sigma(i)^2 = Sigma^2 for all I (Constant Variance)

4.3.2 Test of Autocorrelation

An autocorrelation test is done to check for the presence of serial correlation in the residuals of a regression model. This test is crucial for ensuring the validity of model assumptions, the accuracy of coefficient estimates, the reliability of hypothesis tests, and the overall robustness of the model. According to the result of the Wooldridge test for autocorrelation presented in the following Table 7, the P value was found to be 0, which lets us reject the null hypothesis to verify the presence of first-order autocorrelation in our model. So, our fixed effect model suffers from autocorrelation problem.

Table 7: Summary of the output of the Wooldridge test for autocorrelation

Wooldridge Test for Autocorrelation	
Chi^2	306.096
P-Value	0.00

Source: Author's estimation based on STATA $\qquad$ H_0: There is no first-order autocorrelation

4.3.3 Test of Omitted Variable Bias

A test for omitted variable bias is conducted to identify whether an important variable has been excluded from a regression model. Omitting a relevant variable that is correlated with both the dependent variable and one or more of the included independent variables can lead to biased and inconsistent coefficient estimates.

This affects the reliability and validity of the model's predictions and inferences. Following table 8 shows the findings from the Ramsey RESET test for detecting omitted variable bias. The derived p value is 0.0286, which enable us to reject the null hypothesis to conclude that the model of this study suffers from the omitted variable bias problem.

Table 8: Summary of the output of the Ramsey RESET test for omitted variables

Ramsey RESET test for Omitted Variables	
Chi^2	3.17
P-Value	0.0286

Source: Author's estimation based on STATA H_0: Model has no omitted variables

4.3.4 Test of Multicollinearity

High multicollinearity among the independent variables can lead to unreliable and unstable estimates of the regression coefficients. Small changes in the model or data can result in large variations in the coefficient estimates. As a consequence, the variance inflation factor

was calculated to determine whether our model suffers from multicollinearity, which is displayed on the Table 9. Each of the variables in this study has a variance inflation factor of less than 10, which lets us conclude that the study is free from the multicollinearity problem.

Table 9: Variance inflation factor

Variables	VIF	1/VIF
Director's Ownership	4.48	0.2230
Government Ownership	4.33	0.2310
Board Size	2.87	0.3489
Institutional Ownership	2.42	0.4127
Big Four Auditor	2.4	0.4161
Audit Committee	2.33	0.4287
Independent Directors	2.3	0.4342
Big Three Credit Rating Agency	1.99	0.5035
Board Meetings	1.84	0.5449
DSE listed	1.64	0.6094
Bank Size	1.5	0.6660
Foreign Ownership	1.49	0.6706
Audit Committee Meetings	1.44	0.6947
Mean VIF	**2.39**	

Source: Author's estimation based on STATA

In summary after performing the several diagnostic checks, the pooled OLS model was found to be better than the random effect model as per the BP-LM test while the Hausman test proved the fixed effect model to be better suited for this study in contrast to the random effect model. The presence of heteroskedasticity, omitted variable bias, and first-order autocorrelation were confirmed through the execution of the Wald test, Ramsey RESET test and Wooldridge test respectively. However, the model was found to be devoid of any significant multicollinearity. Therefore, the One-Step System GMM technique was used to adjust for any heteroskedasticity and endogeneity observed in the study. The one-year lag of the dependent variable NPL is statistically significant under a 10% level of significance.

5. Conclusion with policy implications

The objective of this study has been already accomplished to examine the impact of corporate governance attributes on the non-performing loans of private commercial banks in Bangladesh considering a panel data for 10 private commercial banks of Bangladesh based on convenience sampling from the period of 2012 to 2021 yielding a sample size of 100. A number of determinants of corporate governance were found significantly affecting the level of NPL of our sampled banks in this paper. Research into these determinants can help in the formulation of comprehensive corporate governance frameworks tailored to the banking sector in Bangladesh. It can identify best practices in board composition, audit processes, and ownership structures that are most effective in reducing NPLs. The findings of this paper as discussed in the empirical section can lead to specific regulatory changes or recommendations. For example, setting standards for board size, the proportion of independent directors, or the frequency of board and audit committee meetings would lead to a specific change in banking regulation of Bangladesh. Moreover, Insights into how different ownership structures (like government, institutional, or foreign ownership) impact NPLs can inform policies on bank ownership and investment regulations. It could lead to guidelines that balance the benefits of diverse ownership types while mitigating associated risks. In addition, understanding the role of credit ratings and the inclusion of external auditors can influence policies related to risk assessment and management. This might include mandating certain risk management practices for banks with specific credit ratings or enhancing the scope of external audits. As our paper indicates that bank size has a significant impact on NPLs, it could lead to policies addressing the management and operational complexities of large banks, or encourage practices that smaller banks use effectively to manage NPLs. Further, Insights into how stock market listing affects NPLs can inform policies regarding public listing requirements for banks, such as disclosure norms, financial reporting standards, and investor communication. This research can help in crafting tailored strategies for different categories of banks (like small vs. large, government-owned vs. privately-owned) to manage their NPLs effectively. The findings of this paper can also highlight the need for capacity building and training programs in areas like corporate governance, risk management, and financial reporting for the banking sector in Bangladesh. Understanding the effectiveness of audit committees in managing NPLs can lead to policies that

strengthen their role, responsibilities, and independence in banks. Moreover, this study can encourage policies promoting greater transparency and accountability in the banking sector, building public trust and investor confidence.

Overall, such a comprehensive investigation can provide critical insights for policymakers, regulators, and banking institutions in Bangladesh, aiding in the development of more resilient, stable, and efficient banking practices that minimize the risk of NPL.

References

Adegboye, A., Ojeka, S. and Adegboye, K., 2020. Corporate governance structure, Bank externalities and sensitivity of non-performing loans in Nigeria. *Cogent Economics and Finance*, *8*(1), p.1816611.

Agoraki, M.E.K., Delis, M.D. and Staikouras, P.K., 2010. The effect of board size and composition on bank efficiency. *International Journal of Banking, Accounting and Finance*, *2*(4), pp.357-386.

Ahmad, F. and Bashir, T., 2013. Explanatory power of bank specific variables as determinants of non-performing loans: Evidence form Pakistan banking sector. *World Applied Sciences Journal*, *22*(9), pp.1220-1231.

Ahmad, M.I., Guohui, W., Hassan, M., Naseem, M.A. and Rehman, R.U., 2016. NPL and corporate governance: A case of banking sector of Pakistan. *Accounting and Finance Research*, *5*(2), pp.32-41.

Ahmad, M.I., Guohui, W., Hassan, M., Naseem, M.A. and Rehman, R.U., 2016. NPL and corporate governance: A case of banking sector of Pakistan. *Accounting and Finance Research*, *5*(2), pp.32-41.

Akter, A., Hossain, M.K., Alam, M.J. and Islam, M., 2021. Do the attributes of audit committee explain non-performing loans? Evidence from an emerging economy. *Asia-Pacific Management Accounting Journal (APMAJ)*, *16*(3), pp.327-357.

Akwaa Sekyi, E.K., Moreno Gené, J., Miglietta, F. and Roncone, V., 2018. How does board characteristics and insider ownership affect non-performing loans (NPLS) in European banking?.*New trends in accounting and management, 2018, núm. 14, p. 1-66.*

Almutair, S., 2015. Dynamics of the relationship between bank loans and stock prices in Saudi Arabia. *International Business and Economics Research Journal (IBER)*, *14*(3), pp.439-452.

Alves, S., 2014. The effect of board independence on the earnings quality: evidence from portuguese listed companies. *Australasian*

Accounting, Business and Finance Journal, *8*(3), pp.23-44.

Amuakwa–Mensah, F. and Boakye–Adjei, A., 2015. Determinants of non–performing loans in Ghana banking industry. *International Journal of Computational Economics and Econometrics*, *5*(1), pp.35-54.

Balagobei, S., 2019. Corporate governance and non–performing loans: Evidence from listed banks in Sri Lanka. *Balagobei, S.(2019). Corporate governance and non-performing loans: evidence from listed banks in Sri Lanka, International Journal of Accounting and Business Finance*, *5*(1), pp.72-85.

Boone, A.L., Field, L.C., Karpoff, J.M. and Raheja, C.G., 2007. The determinants of corporate board size and composition: An empirical analysis. *Journal of financial Economics*, *85*(1), pp.66-101.

Boudriga, A., Taktak, N.B. and Jellouli, S., 2010, September. Bank specific, business and institutional environment determinants of banks nonperforming loans: evidence from mena countries. In *Economic research forum, working paper* (Vol. 547, pp. 1-28).

Boumparis, P., Milas, C. and Panagiotidis, T., 2019. Non-performing loans and sovereign credit ratings. *International Review of Financial Analysis*, *64*, pp.301-314.

Brickley, J.A. and Zimmerman, J.L., 2010. Corporate governance myths: comments on Armstrong, Guay, and Weber. *Journal of Accounting and Economics*, *50*(2-3), pp.235-245.

Brownbridge, M. and Harvey, C., 1998. Financial Liberalization in Difficult Circumstances. *Banking in Africa. Oxford: Africa World Press, Inc*.

Burgstahler, D.C., Hail, L. and Leuz, C., 2006. The importance of reporting incentives: Earnings management in European private and public firms. *The accounting review*, *81*(5), pp.983-1016

Bussoli, C., Gigante, M. and Tritto, M.B., 2015. The impact of corporate governance on banks performance and loan quality: Evidence from Italian co-operative banks. *Economic and Social Development: Book of Proceedings*, p.432.

Charfeddine, L. and Elmarzougui, A., 2010. Institutional ownership and firm performance: Evidence from France. *IUP Journal of Behavioral Finance*, *7*(4), p.35.

Chung, K.H. and Zhang, H., 2011. Corporate governance and institutional ownership. *Journal of financial and quantitative analysis*, *46*(1), pp.247-273.

El-Chaarani, H., 2014. The impact of corporate governance on the performance of Lebanese banks. *The International Journal of Business and Finance Research*, *8*(5), pp.35-46.

Fama, E.F. and Jensen, M.C., 1983. Separation of ownership and control. *The journal of law and Economics*, *26*(2), pp.301-325.

Fehr, E., 2016. Institutional ownership and performance: An Overview in emerging and developed countries.

Francis, B., Hasan, I., Koetter, M. and Wu, Q., 2012. Corporate boards and bank loan contracting. *Journal of Financial Research*, *35*(4), pp.521-552.

Habib, M. A., 2016. Relationship between corporate governance and firm performance: A case study in Bangladesh. *International Scholar Journal of Accounting and Finance*, *2*(1), pp.11-20.

Herdjiono, I. and Sari, I.M., 2017. The effect of corporate governance on the performance of a company. Some empirical findings from Indonesia. *Central European Management Journal*, *25*(1), pp.33-52.

Hermalin, B.E. and Weisbach, M.S., 1991. The effects of board composition and direct incentives on firm performance. *Financial management*, pp.101-112.

Hoque, M.Z., Islam, R.M. and Ahmed, H., 2013. Corporate governance and bank performance: The case of Bangladesh. *Available at SSRN 2208903*.

Houqe, M.N., van Zijl, T., Dunstan, K. and Karim, A.W., 2015. Corporate ethics

and auditor choice–international evidence. *Research in Accounting Regulation*, *27*(1), pp.57-65.

Iannotta, G., Nocera, G. and Sironi, A., 2007. Ownership structure, risk and performance in the European banking industry. *Journal of banking and finance*, *31*(7), pp.2127-2149.

Ibrahim, M.H., 2006. Stock prices and bank loan dynamics in a developing country: The case of Malaysia. *Journal of Applied Economics*, *9*(1), pp.71-89.

Imam, M.O. and Malik, M., 2007. Firm performance and corporate governance through ownership structure: Evidence from Bangladesh stock market. *International Review of Business Research Papers*, *3*(4), pp.88-110.

Irawati, N., Maksum, A., Sadalia, I. and Muda, I., 2019. Financial performance of indonesian's banking industry: the role of good corporate governance, capital adequacy ratio, non performing loan and size. *International Journal of Scientific and Technology Research*, *8*(4), pp.22-26.

Islam, J., Sathye, M. and Hu, H., 2015. Examining the relationship between corporate governance and bank performance in Bangladesh. *South African Journal of Business Management*, *46*(4), pp.43-52.

Islam, M.N., 2020. The impact of board composition and activity on non-performing loans.

Jansen, M. and Meckling, W., 1976. Theory of the Firm: Manajeral Behavior, Agency Cost and Ownership. *Journal of Financial Economic*, pp.305-360.

Kalsie, A. and Shrivastav, S.M., 2016. Analysis of board size and firm performance: evidence from NSE companies using panel data approach. *Indian Journal of Corporate Governance*, *9*(2), pp.148-172.

Keeton, W.R. and Morris, C.S., 1987. Why do banks' loan losses differ.*Economic review*, *72*(5), pp.3-21.

Khatun, A. and Ghosh, R., 2019. Corporate governance practices and non-performing loans of banking sector of Bangladesh: a panel data analysis. *International Journal of Accounting and Financial Reporting*, *9*(2), pp.12-28.

Kiel, G.C. and Nicholson, G.J., 2003. Board composition and corporate performance: How the Australian experience informs contrasting theories of corporate governance. *Corporate governance: an international review*, *11*(3), pp.189-205.

Lestari, D., 2018. Corporate governance, capital reserve, non-performing loan, and bank risk taking. *International Journal of Economics and Financial Issues*, *8*(2), p.25.

Lin, Z.J. and Liu, M., 2009. The impact of corporate governance on auditor choice: Evidence from China. *Journal of International Accounting, Auditing and Taxation*, *18*(1), pp.44-59.

Mollah, S., Al Farooque, O. and Karim, W., 2012. Ownership structure, corporate governance and firm performance: Evidence from an African emerging market. *Studies in Economics and finance*.

Muttakin, M.B. and Ullah, S., 2012. Corporate governance and bank performance: Evidence from Bangladesh. *Corporate Governance and Bank Performance: Evidence from Bangladesh (October 1, 2012). Corporate Board: Role, Duties and Composition*, *8*(1).

Nath, S.D., Islam, S. and Saha, A.K., 2015. Corporate board structure and firm performance: the context of pharmaceutical industry in Bangladesh. *International Journal of Economics and Finance*, *7*(7), pp.106-115.

Nyor, T. and Mejabi, S.K., 2013. Impact of corporate governance on non-performing loans of Nigerian deposit money banks. *Journal of Business and Management*, *2*(3), pp.12-21.

Phung, D.N. and Le, T.P.V., 2013. Foreign Ownership, Capital Structure and Firm Performance: Empirical Evidence from Vietnamese Listed Firms. *IUP Journal of Corporate Governance*, *12*(2).

Poudel, R.P. and Hovey, M., 2012. Corporate governance and efficiency in Nepalese

commercial banks. *Available at SSRN 2163250.*

Poudel, R.P. and Hovey, M., 2012. Corporate governance and efficiency in Nepalese commercial banks. *Available at SSRN 2163250.*

Raghunandan, K. and Rama, D.V., 2007. Determinants of audit committee diligence. *Accounting Horizons*, *21*(3), pp.265-279.

Rahman, M.A. and Islam, J., 2018. The impact of corporate governance on bank performance: Empirical evidence from Bangladesh. *Global Journal of Management and Business Research*, *18*(C8), pp.49-54.

Rajan, R.G., 1994. Why bank credit policies fluctuate: A theory and some evidence. *the Quarterly Journal of economics*, *109*(2), pp.399-441.

Rashid, M.H.U., Zobair, S.A.M., Chowdhury, M.A.I. and Islam, A., 2020. Corporate governance and banks' productivity: evidence from the banking industry in Bangladesh. *Business Research*, *13*, pp.615-637.

Rouf, A., 2012. The relationship between corporate governance and value of the firm in developing countries: Evidence from Bangladesh. Journal of Economics and Business Research, 18(1), pp.73-85.

Sapienza, P., 2004. The effects of government ownership on bank lending. *Journal of financial economics*, *72*(2), pp.357-384.

Sarkar, J. and Sarkar, S., 2000. Large shareholder activism in corporate governance in developing countries: Evidence from India. *International Review of finance*, *1*(3), pp.161-194.

Sen, K.K., Abedin, M.T., Hossain, T. and Ghosh, R., 2022. Audit Committee Independence, Director Ownership, Audit Quality and Non-performing Loans. *Asian Journal of Accounting and Governance*, *18*, pp.69-83.

Tahir, M., Shah, S.S.A., Sayal, A.U. and Afridi, M.A., 2020. Loan quality: does bank corporate governance matter?.*Applied Economics Letters*, *27*(8), pp.633-636.

Topak, M.S., 2011. The effect of board size on firm performance: Evidence from Turkey. *Middle Eastern Finance and Economics*, *14*(1), pp.1450-2889.

Wiseman, R.M., Cuevas-Rodríguez, G. and Gomez-Mejia, L.R., 2012. Towards a social theory of agency. *Journal of management studies*, *49*(1), pp.202-222.

Zgarni, A., Fedhila, H. and El Gaied, M., 2018. Audit committee and discretionary loan loss provisions in Tunisian commercial banks. *International Journal of Economics and Financial Issues*, *8*(2), p.85.

Zhuang, J., 1999. Some conceptual issues of corporate governance. © Asian Development Bank. http://hdl.handle.net/11540/2616. License: CC BY 3.0 IGO.

Appendix:

Table 10: Pearson's correlation matrix

	NPL	bdsize	id	bdmeet	aud	aud-meet	dirown	insown	govown	forown	SZ	dselist	big-three	big-four
NPL	1													
bdsize		1												
id		-0.52***	1											
bdmeet				1										
aud		0.53***	-0.35***	0.40***	1									
aud-meet				0.35***		1								
dirown	0.25**	0.21**		-0.47***	-0.21**	-0.41***	1							
insown		0.34***		0.29***	0.26***	0.30***	-0.27***	1						
govown		-0.32***	0.27***	0.35***		0.22**	-0.72***	0.17*	1					
forown							-0.30***	0.32***	0.36***	1				
sz											1			
dselist	0.20**		0.19*	-0.20**	-0.18*			0.22**		0.21**		1		
big-three	-0.24**	-0.28***			-0.19*			-0.32***			0.42***	-0.35***	1	
bigfour			0.16*					-0.50***	-0.37***	-0.39***		-0.23**	0.18*	1

Source: Author's contribution based on STATA.   Note:*, **, *** indicate the level of significance at 10%, 5% and 1% respectively.

It is also evident from correlation matrix displayed on table 10, where all of the correlation coefficients were found to be less than 0.80. Among the independent variables, board size and board meetings were found to have the most number of significant correlations with the other independent variables followed by institutional ownership and audit committee size.