

Board Independence and Loan Loss Provisioning: Evidence from Listed Commercial Banks in Bangladesh

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Abstract

This study examines the association between board independence and banks' loan loss provisioning and the moderating effect of the COVID-19 pandemic, institutional ownership, and audit committee activity. To circumvent the potential endogeneity issue, this study utilizes a panel data approach with random-effects estimation as well as two-stage least-squares (2SLS) regression with IVs for listed commercial banks in Bangladesh and a time span from 2014 to 2024. The results of this study show that there is a positive association between the ratio of independent directors on the board and banks' loan loss provisioning, which means banks with a high ratio of independent directors have higher loan loss provisioning. In addition, the relationship between board independence and loan loss provisioning is positively affected by the COVID-19 pandemic, while the moderating effects of the COVID-19 pandemic and institutional ownership and audit committee activity on the relationship between board independence and loan loss provisioning are not statistically significant. Perhaps most important, the findings are fairly robust to alternative model specifications and estimation methods. The direct influence of board independence is statistically insignificant after accounting for possible endogeneity by using the two-stage least squares (2SLS) estimation, but overall, the results support the credibility of the study and add to the corporate governance and banking literature.

Keywords: Loan Loss Provisioning, COVID-19 pandemic, Institutional Ownership, Audit Committee Activity, Commercial Banks

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1. Introduction

In the banking sector, which is characterized by high levels of information asymmetry, credit risk, and managerial discretion, effective governance mechanisms are especially significant for financial stability, corporate governance, and financial reporting. Board independence is a significant governance mechanism because independent directors strengthen monitoring, reduce managerial opportunism, and enhance financial reporting quality (Jensen and Meckling, 1976). This is especially true about loan loss provisioning (LLP), where a significant degree of managerial judgment exists that could impact bank earnings, capital adequacy, and the reliability of financial information.

The impact of board independence on loan loss provisioning is, however, theoretically and empirically discussed. Independent directors can help to enhance the monitoring of credit risk and promote prudent provisioning in accordance with agency theory (Jensen and Meckling, 1976; Al-Homaidi et al., 2021; Elamer et al., 2021). In contrast, effective monitoring can be hindered by a lack of expertise in the bank or by institutional issues (Nawaz, 2019). This is because some existing studies have found positive (Ozili and Outa, 2017), negative, and insignificant relationships between governance and provisioning, implying that the relationship between governance and provisioning could be specific to institutional and bank-specific conditions.

In this context, the present study aims to analyze the relationship between board independence and loan loss provisioning for the listed commercial banks in Bangladesh. It also examines whether this relationship varies in the COVID-19 period and in the case of institutional ownership and audit committee activism. The study examines four hypotheses related to the direct relationship and these moderating effects, thus expanding the analysis of board monitoring, governance effectiveness, and managerial discretion in banks.

This study makes a number of contributions to the literature. First, there is no clear consensus about the role of independence in the development of banks, and the evidence from Bangladesh and other emerging markets in banking is limited (Nawaz, 2019). Second, the study takes into account the contextual factors that may affect the effect of board independence on provisioning behavior, such as COVID-19, institutional ownership, and audit committee activity (Buallay et al., 2022; Nguyen and Dang, 2022). This study, in the context of the Bangladeshi

banking industry, offers additional insights into the governance–provisioning relationship and the impact of institutional and regulatory environments in an emerging economy.

2. Literature Review

In recent times, board independence is a vital governance mechanism in corporate governance due to the necessary role of independent directors in strengthening monitoring, curbing managerial opportunism, reducing information asymmetry, and enhancing financial reporting quality (Al-Homaidi et al., 2021). The arguments are significant for banks as the implementation of loan loss provisioning (LLP), which is highly judgmental, gives bank managers a wide margin of discretion in reporting earnings, regulatory capital, and recognizing losses (Ozili and Outa, 2017). In agency theory, the independent directors can reduce the agency problem by the way of strengthening the monitoring as well as accountability of the management and thus curb the provisioning behavior of opportunism (Jensen and Meckling, 1976; Nawaz, 2019). Likewise, arguments in favor of shareholders' control over the company argue that improved internal controls, audit quality, and financial reporting processes will be able to limit excessive risk-taking and opportunistic accounting practices with better monitoring by the board.

There are other approaches, both theoretical, which offer complementary explanations. The institutional theory proposes that regulatory expectations, institutional pressures, and the governance norms set in the social environment affect board independence and governance practices (DiMaggio and Powell, 1983). The stakeholder view places emphasis on the duty of the banks to the depositors and creditors, regulators, and other stakeholders, and it suggests that independent directors can contribute to responsible provisioning, transparency, and financial stability (Freeman, 1984). Moreover, the resource dependence theory also implies that independent directors can contribute professional expertise, governance experience, advisory resources, and reputational capital that can enhance risk management, auditing, and financial reporting (Pfeffer and Salancik, 1978). Legitimacy theory connects better governance with higher transparency and accountability, public trust, and credibility of provisioning practices (Suchman, 1995; Liang et al., 2013); stewardship theory is based on the idea that the manager is a responsible steward with goals that may be congruent with the long-term interests of the organization (Davis et al., 1997). These theories suggest that the relationship between board independence and LLP may be direct, through the board's monitoring ability, stakeholder accountability, institutional legitimacy, resource provision, and strategic oversight, as well as indirect through other factors, and that the direction of the relationship may vary depending on the institutional and regulatory context.

But there is no conclusive empirical evidence. To date, research on the relationship between board independence and LLP has yielded mixed results, ranging from negative, positive, to insignificant relationships, depending on the study environment, ownership structure, board expertise, institutional quality, and overall governance environment (Ozili and Outa, 2017; Elamer et al., 2021; Liang et al., 2013; Buallay et al., 2022; Nguyen and Dang, 2022). A significant body of literature found positive relations, claiming that independent directors exercise better monitoring, restrict earnings management, oversee risks, and provide prudent provisioning (Al-Homaidi et al., 2021; Elamer et al., 2021; Khatib et al., 2024). In addition, Nguyen and Dang (2022) showed that better governance leads to better regulatory compliance, internal control, transparency of risk management, and less information asymmetry.

Other research suggests, however, that independent directors are not well-suited to oversee intricate provisioning decisions. They can be inadequate at monitoring due to limited knowledge of the bank, information asymmetry, and restrictions on institutional design, as well as limited executive management (Nawaz, 2019). LLP decisions are so highly judgmental that even in the presence of independent directors, managers could enjoy informational advantages to make provisioning decisions (Ozili and Outa, 2017). Additionally, too much board independence can lead to less information efficiency when outside directors are not knowledgeable enough about the functioning and credit-risk evaluation of banks. These conflicting arguments help to shed light on the ambiguous empirical results and the context and institution-specific nature of the effectiveness of board independence in emerging banking markets like Bangladesh (Mollah and Zaman, 2015).

This relationship can also differ based on institutional and governance circumstances. Therefore, in this study, we regard the contextual factors of the COVID-19 period, institutional ownership, and audit committee activity. The COVID-19 pandemic was a significant shock to the risk environment, credit quality, and provisioning policies of banks (Demirgüç-Kunt et al., 2021). Institutional ownership has the potential to offer other monitoring and reduce agency problems (Shleifer and Vishny, 1986; Elyasiani and Jia, 2010), and audit committee activity serves as an important internal monitoring system to oversee financial reporting and

discretionary provisioning (Abbott et al., 2004; Al-Musalli and Ismail, 2012). This means that these factors offer appropriate contexts for the effectiveness of board independence to vary.

Moreover, there are some characteristics of the bank that can affect LLP. Laeven and Majnoni (2003) and Bouvatier and Lepetit (2008) suggest that bank size may influence provisioning since larger banks tend to hold more diverse portfolios of loans, have more advanced risk-management systems, and are better regulated. The profitability of a bank as reflected in the ROA could affect its earning power and potential capacity to withstand anticipated losses (Kanagaretnam et al., 2004; Ozili and Outa, 2017). The size of the board may have an impact on monitoring, and a high Advance-Deposit Ratio (ADR) may be a sign of the exposure of the bank's lending portfolio and thus a higher level of credit risk (Pathan, 2009; Mollah and Zaman, 2015). Expected loan losses and provisioning requirements are also thought to be positively correlated to NPLs (Bikker and Metzmakers, 2005; Ozili, 2017). Thus, NPLs are expected to be positively correlated with LLP. Furthermore, the frequency of board meetings could enhance monitoring by increasing the frequency of discussions regarding credit risk and provisioning decisions (Vafeas, 1999; Liang et al., 2013).

2.1 Research Gap

Although several factors have been studied, the association between board independence and LLP has remained inconclusive, and the influence of institutional and governance factors on this association remains under-researched (Elamer et al., 2021; Nguyen and Dang, 2022; Ozili, 2020). Existing research tends to focus on two aspects of board independence and provisioning in isolation (e.g., context-neutral mechanisms like institutional ownership and audit committee effectiveness) and has been limited to developed markets. The potential moderators during the COVID-19 period, institutional ownership, and audit committee activity have not been explored in Bangladesh, where institutional and regulatory conditions can affect the governance effectiveness of the firms. The roles of the COVID-19 period, institutional ownership, and audit committee activity as moderating variables are not explored in Bangladesh, where institutional and regulatory conditions may affect the governance effectiveness of the firms. This study hence focuses on these factors in the case of the board independence – LLP relationship in listed commercial banks of Bangladesh to fill these gaps.

2.2 Conceptual Framework

Based on the insights gained from the relevant corporate governance theories, from the previous empirical studies, and the gaps identified, a conceptual framework (Figure 1) has been developed. In this model, the overall effectiveness of board independence mechanisms increases monitoring incentives, leads to better governance, and contributes to better oversight over banks. This, in turn, augments banks' ability to enhance the quality of financial reporting and to limit opportunistic managerial conduct, which has a positive impact on loan loss provisioning practices. It is this governance effectiveness that establishes the conceptual basis for a relationship between board independence and banks' loan loss provisioning behavior. Hypothesis 1 aims to explore the direct association between board independence and LLP. Furthermore, the “COVID-19 period”, “institutional ownership”, and “audit committee activity” are expected to weaken this relationship according to the previous studies on banking and governance. This justifies the postulation of Hypotheses 2 to 4.

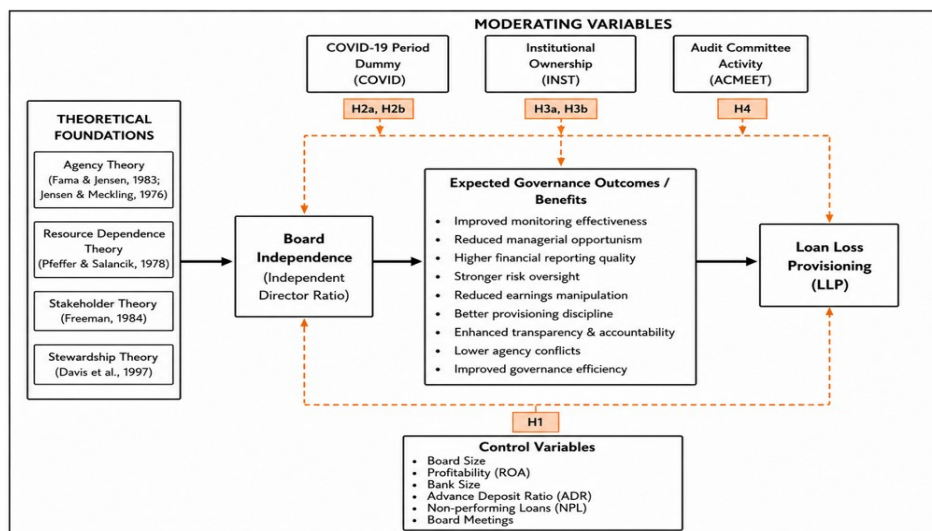


Figure 1. Conceptual Framework, Source: Author

2.3 Hypothesis Development

In the banking and corporate governance literature, there is a long-standing monitoring function of the independent directors of the board, and the higher the level of board independence, the better the quality of financial reporting and board governance, and the lower the level of managerial opportunism (Fama and Jensen, 1983; Beasley, 1996; Klein, 2002; Bushman and Smith, 2001). Independent directors have the potential to enhance monitoring, mitigate information asymmetry, limit discretionary accounting actions, and increase internal control, which in turn can lead to more disciplined and prudent loan loss provisioning (Jensen and Meckling 1976; Xie et al. 2003; Cornett et al. 2008; Pathan 2009; Liang et al. 2013). Agency theory explains this, with independent directors acting in the interests of shareholders, depositors and regulators, and stakeholder and stewardship theory focusing on accountability, transparency, monitoring efficiency, and timely credit-risk management (Faleye and Krishnan, 2017; Beatty and Liao, 2014). There is mixed evidence from various studies, but overall, the governance advantages of board independence appear to exceed its monitoring expenses and are correlated with improved financial reporting and governance results.

Hypothesis 1: Board Independence (as measured by Independent Director Ratio) is negatively associated with banks' Loan Loss Provisioning (LLP).

The effectiveness of the board's monitoring of the bank was of significant importance when it came to provisions and financial reporting, given the economic uncertainty and credit-risk issues brought about by the COVID-19 pandemic. There is evidence that effective governance can enhance reporting discipline in times of economic shocks, and that greater uncertainty can have a significant impact on provisioning and risk reporting (Beatty and Liao, 2021). In addition, significant economic disturbances can impact the effectiveness of governance due to managerial pressures, estimation risks, regulatory requirements, and special operating conditions (Goodell, 2020). The conflicting views suggest that the moderating effect of the COVID-19 period might not be uniform and is especially pertinent in the case of the banking sector in Bangladesh, where the COVID-19 pandemic added an extra strain on credit-risk management and provisioning policies.

Hypothesis 2a: The COVID-19 period moderates the relationship between Board Independence and banks' Loan Loss Provisioning (LLP).

Hypothesis 2b: The COVID-19 period negatively moderates the relationship between Board Independence and banks' Loan Loss Provisioning (LLP) during periods of heightened economic uncertainty.

The importance of institutional ownership for its ability to improve the monitoring function of bank boards may change the effectiveness of board independence in influencing loan loss provisioning due to the monitoring, information, expertise, and financial reporting discipline that institutional investors bring to banks (Shleifer and Vishny, 1986; Cornett et al., 2008). Institutional investors may also prefer increased transparency and good governance from a stakeholder perspective, which can complement independent directors and can help limit opportunistic provisioning behavior, as identified by Gillan and Starks (2003) and Bushee (1998). At the same time, institutional ownership can cause short-term performance pressure and lead to earnings management and high pressure on banks when the number of institutions holding the shares is high, which could also make independent directors less effective (Porter, 1992; Ferreira and Matos, 2008). Inconsistent with stewardship theory, institutional monitoring can supplement or complement board monitoring based on ownership concentration and institutional governance quality (Al-Najjar, 2015); thus, institutional ownership could potentially affect the effectiveness of board independence in influencing LLP.

Hypothesis 3a: Institutional Ownership moderates the relationship between Board Independence and banks' Loan Loss Provisioning (LLP).

Hypothesis 3b: Institutional Ownership positively moderates the relationship between Board Independence and banks' Loan Loss Provisioning (LLP) at higher levels of institutional monitoring.

The active audit committee can enhance the monitoring role of independent directors in the following ways: improve financial reporting oversight, enhance communication among auditors, enhance communication between management and independent directors, enhance the efficiency of the audit, and enhance the quality of internal control (Abbott et al., 2004; Xie et al., 2003). From the stakeholders' point of view, a more effective audit committee monitoring will foster more transparency, accountability, and prudent accounting and provisioning practice (Klein, 2002; Persons, 2005; Carcello and Neal, 2000; Kanagaretnam et al., 2004). There is also evidence that better board and audit oversight can lead to lower levels of earnings management (Bhojraj et al., 2003), and resource dependence theory suggests that the expertise, monitoring, and governance resources provided by active audit committees can lead to lower earnings management (Vafeas, 2005). Thus, higher audit

committee involvement is likely to increase the capacity of the independent directors to encourage prudent loan loss provisioning.

Hypothesis 4: Audit Committee Activity positively moderates the relationship between Board Independence and banks' Loan Loss Provisioning (LLP).

3. Methodology

3.1 Data and Sample Construction

This study is based on quantitative secondary data, which has been collected from the annual reports of listed commercial banks of Bangladesh as primary sources of data and supplemented from disclosures made by Bangladesh Bank and DSE. The sample includes all 36 listed commercial banks on the Dhaka Stock Exchange, which is the population of all the publicly listed commercial banks in Bangladesh. A comprehensive study of the 11-year period of 2014-2024 offers the usefulness of an 11-year longitudinal panel that captures the important changes to the banking sector's governance, regulatory, and post-pandemic environment (Hsiao, 2007; Wooldridge, 2010; Baltagi, 2021). The first sample comprised 36 commercial banks listed on the stock exchange, of which there were 396 bank-year observations. All banks in the sample had complete data on financial and governance characteristics over the study period, so there were no bank-year observations that were dropped from the sample due to missing characteristics. The Institutional Shareholding (IS) information was not available for 42 observations in the bank-year, and so the sample used in the analysis with the IS variable was smaller. Thus, the overall sample contains 36 listed commercial banks and 396 bank-year observations, while the sample used in the analyses with IS contains 354 bank-year observations (see Table 1).

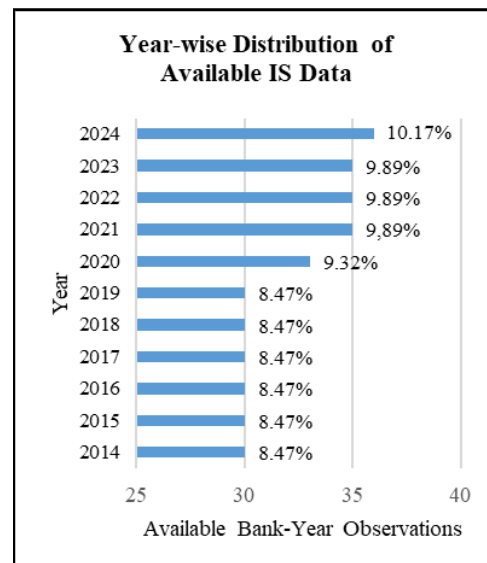
Table 1. Sample Distribution

Panel A. Sample Construction

	No. of Unique Banks	No. of Bank-Year Observations
<i>Initial Sample Size</i>	36	396
Bank-Year Observations with Missing IS Data	0	42
<i>Overall Sample</i>	36	396
<i>Bank-Year Observations with Available IS Data</i>	36	354

Panel B. Sample Distribution

Year	Overall Sample (Bank-Year Observations)	Available IS Data (Bank-Year Observations)	Available IS Data (%)
2014	36	30	8.47%
2015	36	30	8.47%
2016	36	30	8.47%
2017	36	30	8.47%
2018	36	30	8.47%
2019	36	30	8.47%
2020	36	33	9.32%
2021	36	35	9.89%
2022	36	35	9.89%
2023	36	35	9.89%
2024	36	36	10.17%



Note: Table 1 provides insights on the study sample with Panel A outlining the sample construction process and

Panel B reporting the annual sample distribution in tabular and graphical form.

3.2 Model Variables and Specification

The model variables used in this study are described below with the summary presented in table A in Appendix A.

3.2.1 Independent Variable

Board independence (BIND) refers to the percentage of independent (non-executive) directors in the board of directors and is a measure of board monitoring capacity (Pathan, 2009; Liang et al., 2013).

3.2.2 Dependent Variable

Loan loss provisioning (LLP) refers to the natural logarithm of Provision for Loans and Advances (PLA), which is higher the more one will be provisioned (Wooldridge, 2010; Ozili and Outa, 2017).

3.2.3 Moderating Variables

We control for three moderating variables: COVID (COVID-19), a dummy variable for the pandemic period; institutional ownership (INST), defined as the proportion of institutional ownership; and audit committee activity (ACMEET), defined as the number of meetings the audit committee has held once a year (Demirgüç-Kunt et al., 2021).

3.2.4 Control Variables

Board size (BSIZE), board meetings (BMEET), profitability (ROA), bank size (LNTA), advance-deposit ratio (ADR), and non-performing loans (NPL) are the control variables, which reflect important bank-specific and governance characteristics (Vafeas, 1999; Athanassoglou et al., 2008; Berger and DeYoung, 1997; Beatty and Liao, 2014).

3.2.5 Regression Model Specification

Four empirical model specifications are developed to test the hypotheses proposed in this study. The models primarily differ in terms of the moderating variables incorporated into the analysis.

Model 1:

$$LLP_{it} = \beta_0 + \beta_1 IDR_{it} + \beta_2 BMEET_{it} + \beta_3 ROA_{it} + \beta_4 LNTA_{it} + \beta_5 ADR_{it} + \beta_6 NPL_{it} + \alpha_i + \lambda_t + \varepsilon_{it}$$

Model 1 is estimated to examine the direct effect of board independence on banks' loan loss provisioning behavior (Hypothesis 1). LLP_{it} denotes the loan loss provisioning of bank i in year t , and IDR_{it} denotes the independent director ratio for bank i in year t . β_1 is the coefficient that measures the effect of a one-unit increase in board independence on LLP, controlling for the other variables and the fixed effects. The coefficients β_2 , β_3 , β_4 , β_5 , and β_6 estimate the effect of the control variables (Board Size, Board Meetings, Profitability, Bank Size, Advance-Deposit Ratio, and Non-Performing Loans) on LLP while keeping the other variables constant, *ceteris paribus*. α_i denotes the bank fixed effects, and λ_t indicates the year fixed effects. The fixed effects control for unobserved time-invariant characteristics that may influence the board independence–loan loss provisioning relationship (Wooldridge, 2010; Baltagi, 2021). Lastly, the error term ε_{it} represents factors not observed, which could impact LLP for bank i at time t .

Model 2:

$$LLP_{it} = \beta_0 + \beta_1 IDR_{it} + \beta_2 COVID_{it} + \beta_3 (IDR_{it} \times COVID_{it}) + \beta_4 BSIZE_{it} + \beta_5 BMEET_{it} + \beta_6 ROA_{it} + \beta_7 LNTA_{it} + \beta_8 ADR_{it} + \beta_9 NPL_{it} + \alpha_i + \varepsilon_{it}$$

Model 2 is estimated to evaluate the moderating effect of the COVID-19 period on the relationship between board independence and loan loss provisioning. The dependent and independent variables are the same as Model 1. $COVID_{it}$ is a dummy variable that takes the value of 1 when bank i is operating during the period of the COVID-19 pandemic and zero otherwise. The moderating effect of the pandemic between board independence and the LLP relationship is captured in the interaction term $IDR_{it} \times COVID_{it}$. The coefficient β_1 measures the effect of board independence on LLP in the absence of a pandemic, all else being constant. Coefficients β_4 to β_9 represent the influence that the control variables have on LLP. The interaction coefficient β_3 represents the key parameter of interest and represents the moderating effect of the period of COVID-19 on the relationship between board independence and LLP. Importantly, the year fixed effect was not included in this model to obviate the masking of the natural variation in the period-level moderating variable.

Model 3:

$$LLP_{it} = \beta_0 + \beta_1 IDR_{it} + \beta_2 INST_{it} + \beta_3 (IDR_{it} \times INST_{it}) + \beta_4 BSIZE_{it} + \beta_5 BMEET_{it} + \beta_6 ROA_{it} + \beta_7 LNTA_{it} + \beta_8 ADR_{it} + \beta_9 NPL_{it} + \alpha_i + \lambda_t + \varepsilon_{it}$$

Model 3 evaluates whether institutional ownership moderates the relationship between board independence and loan loss provisioning. LLP_{it} is the provision for loans to be paid back by bank i in period t , and IDR_{it} is the bank i 's board independence in period t . The coefficient β_1 shows the impact of board independence on LLP when institutional ownership is zero, *ceteris paribus*, while β_2 reflects the direct impact of institutional ownership ($INST_{it}$) on LLP, and β_3 captures the moderating influence of institutional ownership on the board independence–loan loss provisioning relationship. α_i , λ_t , and ε_{it} are respectively bank-fixed effects, year-fixed effects, and the error term. The bank-fixed effects are represented by α_i , the year-fixed effects are represented by λ_t , and the error term is represented by ε_{it} .

Model 4:

$$LLP_{it} = \beta_0 + \beta_1 IDR_{it} + \beta_2 ACMEET_{it} + \beta_3 (IDR_{it} \times ACMEET_{it}) + \beta_4 BSIZE_{it} + \beta_5 BMEET_{it} + \beta_6 ROA_{it} + \beta_7 LNTA_{it} + \beta_8 ADR_{it} + \beta_9 NPL_{it} + \alpha_i + \lambda_t + \varepsilon_{it}$$

Model 4 examines whether audit committee activity strengthens or weakens the relationship between board independence and loan loss provisioning (Hypothesis 4). The coefficient of β_1 represents the impact of board independence on LLP when the audit committee activity is zero, *ceteris paribus*. $ACMEET_{it}$ is the number of audit committee meetings of bank i in year t . The coefficient β_2 represents the direct effect of audit committee activity on LLP. The interaction between IDR_{it} and $ACMEET_{it}$ is included in the model with coefficient β_3 to test the moderating effect of the audit committee activity on the board independence–LLP relationship. This specification will enable the assessment of the effectiveness of a stronger audit oversight to improve the board's independence in curbing discretionary provisioning behavior. Coefficients β_4 through β_9 are the effects of the control variables on LLP, holding all else constant. Further, the model also incorporates bank-specific fixed effects (α_i) and year-specific fixed effects (λ_t) to capture time-invariant bank-specific and time-specific effects. The error term (ε_{it}) represents the effects of unobserved factors on LLP.

4. Results and Analysis

4.1 Descriptive Statistics

This study uses descriptive statistics to provide a general overview of the sample characteristics, including the distribution and central tendency of the variables studied. With the earlier explanation of the study sample, the descriptive statistics are presented in Table 2.

Table 2. Descriptive Statistics

	Count	Mean	Std. Dev.	min	p25	Median	p75	max
LLP	396	3.043	0.700	0	2.884	3.2	3.431	4.205
IDR	396	.201	0.140	0	.143	.167	.222	.857
BSIZE	396	13.909	4.508	5	11	14	18	23
BMEET	396	18.96	7.498	5	14	17	24	46
ROA	396	.542	1.143	-6.486	.464	.713	1.019	1.837
LNTA	396	5.376	0.402	4.051	5.251	5.456	5.617	6.214
ADR	396	.911	0.115	.618	.84	.911	.98	1.251
NPL	396	.095	0.163	0	.036	.048	.068	.907
COVID	396	.182	0.386	0	0	0	0	1
INST	354	20.766	11.704	2.01	12.86	20.845	26.9	57.06
ACMEET	396	8.106	3.878	3	5	7	10	23

Note: Table 2 presents the descriptive statistics of all variables incorporated in the model specifications of this study. The statistics have been calculated using the winsorized values to mitigate the impact of outliers.

The mean for LLP is 3.043 with a standard deviation of 0.700, which shows that the board's independence has moderate variation. The average for IDR is 0.201 with a standard deviation of 0.140, which means that the board's independence has moderate variation. There is significant variation in institutional ownership, with a mean of 20.766% (SD = 11.704) based on 354 observations for INST. The mean number of meetings conducted

in ACMEET is 8.106 meetings (SD = 3.878), and the mean number of meetings conducted in COVID is 0.182 (SD = 0.422), indicating that 18.2% of observations are conducted within the pandemic period. For the controls, the average number of directors is 13.909, while the average number of meetings held is 18.96. The average ROA for the controls is 0.542; the range is considerable. LNTA has a mean of 5.376, ADR 0.911, and NPL 0.095. Overall, the summary statistics illustrate that there is considerable variation between the different governance, financial, ownership, and risk dimensions. The large spread is observed in almost all of the variables, and this is quite to be expected, as a very broad sample (in terms of the number of listed commercial banks, the number of observations, and the sample period used) is investigated in the study.

4.2 Correlation Analysis

4.2.1 Pearson's Correlation Analysis

The Pearson's correlation coefficient results indicate IDR is significantly and positively correlated with LLP ($r = 0.213$, $p < 0.01$), INST is weakly positive ($r = 0.092$, $p < 0.10$), and ACMEET is positively significant ($r = 0.216$, $p < 0.01$), but COVID is not significantly correlated with LLP. Among the controls, LLP is positively associated with LNTA ($r = 0.643$), ADR ($r = 0.201$), ROA ($r = 0.301$), and BMEET ($r = 0.228$), but negatively associated with BSIZE ($r = -0.083$) and NPL ($r = -0.336$), all at the reported significance levels. The correlations between the explanatory variables are generally moderate, with some significant correlations, and the correlation between IDR and the moderating variables is weak. In general, the correlation results support the hypothesized relationships, and the relationships observed between the explanatory variables indicate that additional multicollinearity analysis should be conducted.

Table 3. Pearson's Correlation Table

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) LLP	1.000										
(2) IDR	0.213***	1.000									
(3) BSIZE	-0.083*	-0.512***	1.000								
(4) BMEET	0.228***	0.003	-0.110**	1.000							
(5) ROA	0.301***	-0.348***	0.362***	0.171***	1.000						
(6) LNTA	0.643***	0.309***	-0.139***	0.357***	0.204***	1.000					
(7) ADR	0.201***	0.156***	0.011	-0.091*	0.000	0.306***	1.000				
(8) NPL	-0.336***	0.368***	-0.467***	-0.150***	-0.800***	-0.277***	-0.051	1.000			
(9) COVID	0.000	-0.034	0.021	-0.100**	0.022	0.107**	-0.008	-0.066	1.000		
(10) INST	0.092*	0.053	-0.069	0.140***	-0.110**	0.181***	0.340***	0.081	0.023	1.000	
(11) ACMEET	0.216***	0.065	-0.063	0.519***	0.131***	0.281***	-0.147***	-0.080	-0.074	-0.017	1.000

Note: Table 3 presents the pair-wise bivariate correlation coefficients. The results mostly align with prior expectations and do not indicate serious multicollinearity. ***, **, * represent statistical significance at the 1%, 5%, and 10% level.

4.2.2 Multicollinearity Analysis

Multicollinearity is the situation where independent variables are highly correlated. This may lead to high standard errors, low statistical power of independent variables, and problems of differentiating between the effects of the independent variables when they are collinear. To assess multicollinearity, insights from Pearson's Correlation test and the Variance Inflation Factor (VIF) test have been used. Pearson's analysis shows that the correlation coefficient of most pairs is rather low and insignificant, meaning that there is not much risk of multicollinearity. This is supported by the VIF test that quantifies the increase in the variance of an estimated regression coefficient when collinearity occurs. The result of the VIF test on the comprehensive model (all variables in one model) is displayed in Table 4.

The VIF values of all variables lie between 1.07 and 3.85 with a mean value of 1.84. This is lower than the widely accepted 10 and conservative benchmark of 5. Furthermore, the tolerance values ($1/VIF$) are between 0.260 and 0.935, which is above the recommended value of 0.1. So, there is no significant concern with multicollinearity in this study.

Table 4. VIF Test

	VIF	1/VIF
NPL	3.849	.26
ROA	3.028	.33
LNTA	1.833	.546
IDR	1.557	.642
BMEET	1.549	.646
BSIZE	1.504	.665
ADR	1.408	.71
ACMEET	1.361	.735
INST	1.243	.805
COVID	1.07	.935
Mean VIF	1.84	

Note: Table 4 presents the variance inflation factors of the model variables. The results indicate the absence of any Multicollinearity.

4.3 Heteroskedasticity Test

A Breusch–Pagan/Cook–Weisberg test was used to check for heteroskedasticity. The null hypothesis of this test is that there is homoskedasticity. The p-values for all the tests are 0.0000, which indicates that the null hypothesis is rejected for all significance levels. Thus, there is evidence of heteroskedasticity in each of the models. For this reason, robust standard errors have been computed in this study for valid statistical inference.

4.4 Hausman Test

This test assesses whether the effects of the individual are uncorrelated with the other regression variables in the model to determine whether a random effect or a fixed effect model should be used in a specific situation (Hausman, 1978). This is important as incorrect methods can lead to biased estimates and loss of efficiency. Wooldridge (2010) states that the null hypothesis of the Hausman test is that the random effect model is the more suitable one versus the alternative hypothesis that the fixed effect model is the better model.

In case of all four models, insignificant Chi-square values ($p > 0.05$) are found, which means that the null hypothesis cannot be rejected at any of the usual significance levels. Therefore, all four model specifications are suitable for the random effects model. This decision is crucial because it implies that there is no correlation between all the individual-specific effects (idiosyncratic impacts) and the explanatory variables in the model, which means that the model can give efficient and consistent estimates in the panel data framework (Wooldridge, 2010).

4.5 Regression Analysis

The overall aim of this study is to determine if there is any relationship between board independence and loan loss provisioning practices of listed commercial banks in Bangladesh. To examine this relationship, a panel regression analysis has been performed along with the moderating effect of the COVID-19 pandemic, institutional ownership, and audit committee meetings. The results of the analysis are shown in Table 5.

Table 5. Regression Results using Random-Effects GLS

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
IDR	0.8066** (0.3598)	0.6797* (0.3552)	1.1903* (0.6406)	0.7003 (0.7641)
BMEET	-0.0053 (0.0061)	-0.0058 (0.0062)	-0.0071 (0.0060)	-0.0045 (0.0075)
ROA	0.0712 (0.1497)	0.0874 (0.1499)	0.1135 (0.1565)	0.0740 (0.1464)
LNTA	0.9922*** (0.2130)	0.9455*** (0.1207)	0.8630*** (0.3044)	0.9913*** (0.2180)
ADR	-0.0771 (0.3694)	-0.0897 (0.3260)	-0.0397 (0.4367)	-0.0735 (0.3523)
NPL	-0.8192* (0.4205)	-0.7595* (0.4612)	-0.7243 (0.6098)	-0.8949** (0.4187)
COVID		-0.2154** (0.1013)		
IDR_COVID		0.4354 (0.2913)		
BSIZE		-0.0148 (0.0111)	-0.0084 (0.0117)	-0.0133 (0.0119)
INST			0.0051 (0.0064)	
IDR_INST			-0.0216 (0.0251)	
ACMEET				-0.0057 (0.0271)
IDR_ACMEET				-0.0024 (0.0835)
Constant	-2.2525** (1.0670)	-1.7311*** (0.6538)	-1.6021 (1.6147)	-1.9925* (1.1207)
Observations	396	396	354	396
Number of Banks	36	36	36	36
Year Fixed Effect	Yes	No	Yes	Yes
Bank Fixed Effect	No	No	No	No
Wald X ²	709.45	224.70	543.48	1232.42
R-squared	0.4797	0.4656	0.4097	0.4811
Prob>X ²	0.0000	0.0000	0.0000	0.0000

Note: Table 5 reports the results of the random-effects regression analysis of the four models developed for the four hypotheses. LLP is the dependent variable and IDR is the independent variable. Year-fixed effects have been incorporated in all models except Model 2, while bank fixed effects are not included as the random-effects estimator is employed. Robust standard errors are reported in parentheses. The statistical significance is denoted

through asterisks. ***, **, and * represent the 1%, 5%, and 10% significance levels, respectively.

The results of Model 1 revealed that there is a positive and statistically significant relationship between board independence and loan loss provisioning ($\beta = 0.8066$, $p < 0.05$), suggesting that as the number of independent directors in the bank increases, the loan loss provision also increases. Thus, this finding indicates that higher board independence can lead to more conservative financial reporting and prudent credit-risk recognition, as it can provide more board oversight over management and expected credit losses. The overall model is statistically significant. Bank size (LNTA) is positively associated with LLP, which is statistically significant, with larger banks having higher provisions, perhaps because of higher credit-risk exposure and regulatory pressure, while NPL is negatively associated with LLP and is statistically significant. The board meetings (BMEET), ROA, and ADR are not statistically significant. The positive association supports the hypothesis that independent directors contribute to strengthening governance, monitoring, and financial reporting quality, but it is contrary to the hypothesized negative association. Thus, in the light of the above facts, it can be seen that the increase in board independence is positively related to the increase in loan loss provisioning of the listed commercial banks in Bangladesh; therefore, Hypothesis 1 is not supported. The results also underscore the value of board independence in making provisioning decisions and indicate that the impact of board independence needs to be assessed in the context of the broader corporate-governance and bank-specific setting.

Model 2 investigates the cross-interaction between board independence and COVID using the COVID-19 dummy variable and the interaction of board independence $\times$ COVID. Board independence has a positive coefficient of 0.6797, which is statistically significant at the 10% level, and the COVID-19 dummy's coefficient is -0.2154, which is statistically significant at the 5% level. Nevertheless, the interaction term Board independence $\times$ COVID-19 is not statistically significant ($\beta = 0.4354$), meaning that the impact of the pandemic on the relationship between board independence and LLP is not significant. The overall model was statistically significant with the Wald Chi-square test ($\text{Prob} > \chi^2 = 0.0000$), and the direction and significance of the control variables in this model were largely similar to those in Model 1. The discovery suggests that COVID-19 led to greater credit-risk uncertainty and caused more conservative provisioning, but that there was not much change in the monitoring role of independent directors during the crisis. This may be due to the greater importance of regulatory needs, prudential supervision, and adverse macroeconomic conditions on provisioning during systemic shocks. Therefore, if there is a little increase in provisioning because of the pandemic, it does not support hypothesis 2a, nor hypothesis 2b.

Model 3 tests the moderation effect of institutional ownership on the association between board independence and LLP. However, the proportion of independent directors on the board is still statistically significantly positively associated with loan loss provisioning ($\beta = 1.1903$, $p < 0.10$), suggesting that banks with a greater proportion of independent directors still have higher provisioning for loans that have gone bad. The association between institutional ownership and LLP is positive but is statistically insignificant ($\beta = 0.0051$), and the association between IDR and institutional ownership is negative but is also statistically insignificant ($\beta = -0.0216$). The negative interaction coefficient suggests that the positive association between board independence and provisioning may be somewhat restricted when institutional ownership increases, but the coefficient is not statistically significant, and the moderating impact of institutional ownership cannot be confirmed. The model accounted for a large proportion of the variance in LLP and fit overall reasonably well. Agency theory implies that institutional investors can be expected to monitor more effectively, because they are more knowledgeable, have more information, and have more oversight; while stakeholder theory would predict that they are more likely to induce transparency and accountability, given their long-term orientation. The insignificant moderating effect, however, is also in line with the hypothesis that institutional investors can create short-term performance pressures or replace the role of the board of directors in the monitoring process, depending on the level of ownership concentration and the quality of governance. In conclusion, the findings suggest that the role of board independence in affecting LLP is not significantly different from its contribution in the presence of institutional ownership in Bangladesh. Thus, Hypothesis 3 is rejected, and it is not necessary to simply have institutional investors to enhance the role of independent directors as a governance role.

Model 4 examines whether any such moderating effect between board independence and LLP exists due to the activity of the audit committee. Board independence is of course positive ($\beta = 0.7003$), but statistically insignificant, and audit committee activity, in terms of the number of audit committee meetings, is also negative ($\beta = -0.0057$), but not statistically significant. More importantly, the relationship between the number of audit committee meetings and board independence is negative and statistically insignificant ($\beta = -0.0024$), which suggests that the more meetings the audit committee has, the less positive the relationship between board independence and LLP. The overall model is statistically significant, and among the explanatory variables there

is some variation in LLP – but the empirical evidence suggests not a positive moderating effect. The finding indicates that committee meeting frequency is not necessarily enough to measure the effectiveness of audit committees—committee independence, financial expertise, meeting quality, and effective governance practices could be more important. This aligns with agency theory, which focuses on effective monitoring, and earlier research confirming that the role of independent boards is strengthened by more frequent meetings; the present findings suggest that, however, more frequent meetings do not necessarily lead to a better impact on the provisioning decision. Thus, Hypothesis 4 is rejected. The results suggest that in addition to the frequency of audit committee meetings, regulators and bank management should pay attention to the quality, expertise, independence of the audit committee, and effective credit risk supervision.

4.6. Robustness Test using two-stage least squares regression

It is especially important to use an alternative method of estimation since the baseline regression might not take into account the possibility that governance characteristics and decisions regarding provisioning are jointly determined. The robustness analysis enables a more reliable evaluation of the relationship between board independence and LLP by allowing the study to check whether its main findings stay the same when potential endogeneity is explicitly taken into account. Therefore, the 2SLS results act as a significant validation of the baseline empirical evidence.

A two-stage least squares (2SLS) regression is used as an additional robustness test to check the robustness and reliability of the main empirical findings. This analysis aims to assess the robustness of the estimated association between board independence and loan loss provisioning (LLP), controlling for potential endogeneity issues. Endogeneity can occur when board independence and provisioning decisions are related to each other, and other variables that are not observable at the bank level can impact the provisioning decision and/or board independence. Thus, the 2SLS approach offers an alternative estimation method based on instrumental-variable methodology to cleanse the potentially endogenous component of board independence. This can be used to check if the main direction of the relationship and its statistical significance hold up when controlling for the potential effect of endogeneity. This is why the 2SLS results are then contrasted to the baseline findings to see if the core results are sensitive to the use of a different estimation approach.

Following previous corporate governance studies, the one-year lagged value of board independence (L_IDR) was used as the instrumental variable. As additional instruments, the lagged interaction terms were also used for the moderation models. The instrumental variable analysis gives a strong indication of the validity of the instruments that are being used. The first-stage F-statistic is found to be 85.54, which is far greater than the conventional first-stage threshold value of 10, thus proving that the instrument has adequate strength. Moreover, the Kleibergen–Paap rk Wald F-statistic (85.54) is higher than the Stock–Yogo critical values, and the Kleibergen–Paap rk LM statistic (27.09) is significant at the 1% level, indicating that the model is identified and that weak instrument issues are not likely to impact the estimation results. These diagnostic results strengthen the credibility of the 2SLS specification and support the use of the selected instruments in addressing potential endogeneity. Table 6 shows the results of the regression analysis using 2SLS.

Table 6. Regression results of the two-stage least squares method

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
IDR	0.5942 (0.6005)	0.2009 (0.8866)	0.0766 (0.8269)	-0.7298 (1.4142)
BMEET	-0.0023 (0.0039)	-0.0038 (0.0045)	-0.0052 (0.0051)	-0.0035 (0.0051)
ROA	0.0815 (0.1189)	0.0736 (0.1250)	0.0835 (0.1269)	0.0489 (0.1328)
LNTA	0.9599*** (0.1618)	0.9557*** (0.1617)	0.6795*** (0.2550)	0.8827*** (0.1579)
ADR	0.0095 (0.3608)	0.0837 (0.3429)	0.0737 (0.3919)	0.1445 (0.3155)
NPL	-0.5013 (0.6237)	-0.6671 (0.6649)	-0.9614 (0.6754)	-0.8101 (0.7029)
IDR_COVID		0.6547 (0.8642)		
COVID		-0.2202 (0.2073)		
BSIZE		-0.0159 (0.0117)	-0.0124 (0.0109)	-0.0122 (0.0105)
IDR_INST			-0.0001 (0.0565)	
INST			0.0029 (0.0131)	
IDR_ACMEET				0.1645 (0.1389)
ACMEET				-0.0187 (0.0267)
Constant	-2.1107*** (0.6910)	-1.8140*** (0.6608)	-0.3236 (1.3660)	-1.4640** (0.7171)
Observations	360	360	324	360
Number of Banks	36	36	36	36
Year Fixed Effect	Yes	No	Yes	Yes
Bank Fixed Effect	No	No	No	No
R-squared	0.4591	0.4646	0.3972	0.4572
Prob>Chi²	0.0000	0.0000	0.0000	0.0000

Note: Table 6 reports the second-stage results of the 2SLS regression. The instrumental variable used is the one-year lagged independent director ratio (L_IDR). Robust standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively. The first-stage F-statistic is 85.54, indicating a strong instrument.

The findings of the 2SLS regression analysis broadly support the results that were found using the random effects models. Model 1 re-examines the direct relationship between board independence and loan loss

provisioning. The coefficient of board independence is still positive ($\beta = 0.5942$), but not statistically significant ($p > 0.10$). Thus, Hypothesis 1 was not confirmed when controlling for possible endogeneity. The relationship of loan loss provisioning with the remaining control variables is not statistically significant, except for bank size (LNTA), which is still positive and highly significant ($\beta = 0.9599$, $p < 0.01$).

In Model 2, the moderating effect of the COVID-19 pandemic is explored. The interaction term $IDR \times COVID$ is positive ($\beta = 0.6547$) but not statistically significant ($p > 0.10$), suggesting that the COVID-19 pandemic does not have a significant moderating effect on the relationship between board independence and loan loss provisioning. Similarly, the coefficients of the board independence and COVID dummy variables are not statistically significant. Therefore, the 2SLS estimation does not support Hypothesis 2. As with Model 1, the size of a bank is shown to be positively correlated with loan loss provisioning at the 1% level.

In Model 3, the moderating role of institutional ownership is considered. The interaction term $IDR \times INST$ is negative ($\beta = -0.0001$) and statistically insignificant ($p > 0.10$), thus suggesting that the effect of board independence does not significantly interact with institutional ownership on loan loss provisioning. Likewise, the coefficient for institutional ownership is not statistically significant. So, Hypothesis 3 is rejected by the instrumental variable estimation. As in the past, bank size is positive and statistically significant ($\beta = 0.6795$, $p < 0.01$).

Model 4 examines the moderating effect of audit committee meetings. The interaction term $IDR \times ACMEET$ is still positive ($\beta = 0.1645$) but not statistically significant ($p > 0.10$), indicating that the interaction of IDR and ACMEET does not significantly influence the relationship. Similarly, the coefficient for the audit committee meetings is not statistically significant. Thus, there is no evidence to endorse the 2SLS estimation for Hypothesis 4. Similar to the bank size in the previous models, the current model shows that bank size is statistically significant and positively related to loan loss provisioning ($\beta = 0.8827$, $p < 0.01$).

The overall results of the 2SLS regression models are quite similar to those from the random effects models. Board independence and all the moderating interaction terms are still not statistically significant after controlling for potential endogeneity, while the direction of the estimated coefficients is largely unchanged. The finding of this study is thus not sensitive to endogeneity and alternative estimation methods.

5. Conclusion

This study analyzes the effects of COVID-19, institutional ownership, and audit committee activity on the board independence and banks' loan loss provisioning (LLP) relationship. Random-effects regression and 2SLS are used to solve the endogeneity problem of listed commercial banks in Bangladesh.

The results reveal that the board's independence has a positive correlation with LLP, which is contrary to the negative hypothesis proposed, suggesting conservative over-credit risk recognition. After accounting for the possible endogeneity, though, the result in 2SLS is not significant, which points to a more complex relationship and possible sensitivity to how LLP is measured.

Both the direct effect of COVID-19 on LLP and the interaction between COVID-19 and board independence are insignificant but positive. The relation between board independence and LLP is not directly affected by institutional ownership and audit committee activities. In this regard, the proposed contextual or governance factors do not make any significant changes to the independent directors' monitoring function.

The results add to the literature on corporate governance and financial reporting, indicating that the hypothesized negative relationship and proposed moderating effects are not supported. They also suggest that the provisioning behavior can vary depending on institutional and contextual factors even though there is not a large gap in the levels of board independence.

The positive relationship between board independence and LLP needs to be viewed with caution due to its negligible level under 2SLS. The high COVID-19 influence indicates that banks are applying more conservative provisioning when uncertainty is present, whereas sound provisioning is essential in effective risk management, internal control and timely recognition of credit risks.

From a policy perspective, more than institutional ownership and frequency of the audit committee meeting should be expected in governance. Governance quality and effectiveness should be a priority for regulators, management, boards and audit committees to build financial reporting, prudent provisioning, banking stability and resilience.

The study has its limitations as it covers only the listed commercial banks in Bangladesh; thus, the findings are

not generalizable. The inclusion of lagged board independence takes care of potential endogeneity, but other unobserved sources might exist. It also emphasizes board independence and three moderators, and the publicly disclosed LLP measure might not necessarily differentiate between discretionary and non-discretionary provisioning.

Future research could examine board gender diversity, financial expertise, CEO duality, ownership concentration, and risk-management committees, as well as cross-country and listed–unlisted comparisons. Alternative LLP proxies and other advanced methods

like dynamic panel estimation could also enhance causal evidence.

Overall, the main results indicate a positive association between board independence and the LLP, which, within the framework of endogeneity correction by 2SLS, is no longer significant. The interaction between COVID-19 and board independence and institutional ownership is not significant, nor is the interaction between COVID-19 and audit committee activity. In conclusion, the results suggest that the relationship between independence of the board and provisioning is complex and context-specific and shows that good governance, transparency, and prudent provisioning are necessary.

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Appendices

Appendix A: Definition of Variables

Table-A: Definition of Variables

Variable	Label	Definition	Reference
Dependent Variable			
Loan Loss Provision	LLP	Natural logarithm of Provision for Loans and Advances reported by the bank.	Ozili and Outa (2017); Amin et al. (2024)
Independent Variable			
Board Independence	IDR	Percentage of independent directors on the board, measured as the number of independent directors divided by total board members.	Pathan (2009)
Moderating Variables			
COVID-19	COVID	Dummy variable equal to 1 for the COVID-19 period and 0 otherwise.	Demirgüç-Kunt et al. (2021)
Institutional Shareholding	INST	Percentage of total shares held by institutional investors.	Cornett et al. (2007)
Audit Committee Meetings	ACMEET	Total number of audit committee meetings held during the financial year.	Abbott, Parker and Peters (2004)
Control Variables			
Board Size	BSIZE	Total number of directors on the board.	Andres and Vallelado (2008)
Board Meetings	BMEET	Total number of board meetings held during the financial year.	Vafeas (1999)
Profitability	ROA	Net income divided by total assets.	Athanasoglou, Brissimis and Delis (2008)
Bank Size	LNTA	Natural logarithm of total assets.	Laeven, Ratnovski and Tong (2016)
Advance-Deposit Ratio	ADR	Total loans and advances divided by total customer deposits.	Berger and DeYoung (1997)
Non-Performing Loans	NPL	Ratio of non-performing loans to total loans and advances.	Beatty and Liao (2014)

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