

## **Corporate Governance Effectiveness And Operational Risk In Banks: The Role Of Firm Size**

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### **Abstract**

While previous research works have extensively examined the direct relationship between corporate governance mechanisms and operational risk, there is limited understanding of how firm size moderates this link. Using a sample of 14 commercial banks in Ghana from 2010 to 2022, we analyse key governance dimensions, including board size, board independence, board meeting frequency, and board financial expertise, to determine their impact on operational risk. Firm size, measured by the natural logarithm of total assets, is introduced as a moderating variable to explore how it influences the governance-risk link. Data was analysed using pooled panel, random, and fixed effects models in Stata. The results indicate that larger banks benefit more from robust governance mechanisms, which help to mitigate operational risk, while smaller banks may experience varying effects. The study confirms the reliability of these findings through tests for serial correlation and heteroscedasticity, both of which indicated no significant issues. These findings provide a better

understanding of how firm size affects corporate governance practices in managing operational risk within the banking sector. The study's limitations involve its concentration on Ghanaian banks and potential endogeneity issues, indicating opportunities for future research to examine wider contexts and additional governance factors.

**Keywords:** *Banks, Firm Size, Operational Risk Corporate Governance*

## **1. Introduction**

After the 2008 global financial crisis, the banking sector was subject to substantial scrutiny and demands for reform (Afonso & Blanco-Arana, 2022). This challenging period revealed significant deficiencies in corporate governance practices and operational risk management within financial institutions worldwide (Torku & Laryea, 2021). In 2008, the Lehman Brothers, an American firm that provided global financial services, filed for bankruptcy (Dallara 2024). At that time, it was recognised as a dominant investment bank in America, ranking fourth among its peers. Its collapse impacted the global financial systems and the economies of many countries. This development underscored the critical importance of robust corporate governance in ensuring financial stability (Dallara, 2024). As regulatory bodies and policymakers endeavoured to rectify these issues, the relationship between corporate governance, operational risk, and bank performance became a central focus for academic research and industry reforms (Shukor et al., 2023).

In Ghana, banks experience challenges regarding operational risk and financial performance. This development impacted the country's national economy. The Bank of Ghana (BOG) reported in its 2020 Banking Sector Report that the financial sector was facing significant distress. According to a study by Blankson, Amewu, and Anarfo (2021), the factors contributing to the distressed state of banks in Ghana, leading to the banking clean-up between mid-2017 and 2018, include poor corporate governance practices, serious capital impairment, serious liquidity impairment, high non-performing loans (NPLs), and low profitability. Consequently, the government and the Bank of Ghana implemented regulatory measures, which resulted in a smaller but more sustainable banking industry.

According to the Banking Sector Report of 2020 by the Bank of Ghana (BOG), the total cost of its clean-up exercise amounted to

approximately \$2.1 billion, representing slightly over 3% of the country's GDP in 2019. In 2017, before the clean-up, Ghana had 36 banks. However, by the end of the clean-up exercise in 2019, this number had decreased to 23. A study conducted by Agyemang, Kong, Ayamba, Tawiah, and Twum (2019) indicates that the BOG revoked the licenses of two indigenous banks—Unique Trust Bank and Capital Bank—on August 14, 2017, due to significant capital impairments. However, it is noteworthy that only a year before its license was cancelled, Capital Bank received awards for being the best-growing bank and the leading financial institution in deposits and savings at the 15th Edition of the Ghana Banking Awards. Similarly, in 2011, the same awarding institution recognised Unique Trust Bank as the best bank in the financial year.

This study extends the research on corporate governance and operational risk by examining the role of firm size in Ghana. Specifically, it investigates board-related mechanisms within various dimensions of corporate governance, following the works of Adams and Mehran (2012). The paper focuses on four broad characteristics: size, independence, meeting frequency, and financial expertise, as these aspects have been identified as important for governance effectiveness in banking institutions (de Andres & Vallelado, 2008; Fernandes et al., 2018). In addition to this introduction, the paper contains four sections. The literature review examines existing research on corporate governance, operational risk, and firm size in the banking context. The methodology section provides details of the research design, including the methods of data collection and analysis and the analytical techniques employed in the study. The results section presents the findings, while the discussion interprets the results and discusses their implications for theory and practice. The conclusion suggests directions for future research in operational risks in the banking and finance sector of the country's economy.

## **2. Corporate Governance, Operational Risk, And Firm Size In The Banking Context**

Various theoretical frameworks can be used to examine the relationship between corporate governance and operational risk. Agency theory indicates that effective governance mechanisms align management interests with those of shareholders, potentially reducing operational risks associated with moral hazard (Chari et al., 2019). Resource dependence theory posits that boards provide essential resources and

connections, improving risk management capabilities (Zona et al., 2018). These theories are evident in the banking sector. For instance, empirical studies by El-Chaarani et al. (2022) show how risk governance structures affected bank performance during the financial crisis, while Kashyap and Iveroth (2021) report significant operational losses in major financial institutions due to governance failures. The Basel Committee's guidelines highlight the need for governance mechanisms to manage operational risk. Banks must establish clear structures, risk management frameworks, and internal controls (Decker & Ntozi-Obwale, 2020). This theory-practice blend underscores governance's role in operational risk management for banks.

Corporate governance (CG) is considered to be the mitigating mechanism that is used to reduce operational risks. According to Solomon (2020), CG is the governing body's application of moral and capable leadership toward establishing a moral culture, high standards of performance, efficient control, and legitimacy. Also, Agyem

ang, Ayamba, Tawiah, and Twum (2019) define it as

the totality of the institutional and organisational mechanisms, and the corresponding decision-making, intervention, and control rights, which serve to resolve conflicts of interest between the various groups which have a stake in a firm and either in isolation or in their interaction, determine how important decisions are taken in a firm, and ultimately also determine which decisions are taken.

Nsaibi, Abidi, and Rajhi (2020) define corporate governance in the context of banking governance, asserting that it serves as a preventive measure against banking risk. Larcker and Tayan (2020) articulate corporate governance as the process of aligning the interests of investors and managers to ensure that companies operate for the benefit of their investors. The Organisation for Economic Cooperation and Development (OECD), as referenced by Aldrige and Sutojo (2005), defined corporate governance as the system by which firms are directed and controlled.

According to Altaf et al. (2022), operational risk represents the direct or indirect loss arising from inadequate external events and malfunctioning internal processes, personnel, and systems. The Basel Committee on Banking Supervision (Shpachuk & Trinh, 2024) describes it as the risk of loss resulting from insufficient or malfunctioning internal systems, personnel, and procedures. Chen et al. (2021) characterise operational risk in terms of its constituent elements, similar to Saunders (2022), who identifies operational risk as stemming from internal and

external sources. Bonet et al. (2021) also describe operational risk as the potential for loss due to deficient or unsuccessful internal systems, personnel, processes, external events, or reputational risk. Furthermore, Chen et al. (2021) list various risks such as portfolio, country, reputational, tax, business continuity, and regulatory risks as components of operational risk. Girling (2022) asserts that operational risk originates from internal and external sources. Consequently, the researcher defines operational risk as the loss caused by adverse external events, including malfunctions in the internal elements such as personnel, systems, and procedures.

The contemporary banking sector has been shaped by increasing globalisation, rapid technological advancements, innovations, and changing regulatory landscapes (Mogaji 2023). These factors have altered the operational risk profile of banks, leading to a re-evaluation of traditional corporate governance models (Sakirovic, 2023). The emergence of fintech companies and digital banking platforms has introduced new competitive pressures and operational challenges, highlighting the need for adaptable governance frameworks in this dynamic market environment (Gold & Ali, 2019; Jameaba, 2022). As banks work to balance innovation with risk management, the role of corporate governance in mitigating operational risks has become crucial for achieving long-term success and stability in the financial sector (Shukor et al., 2023; Alhammadi et al., 2020).

Researchers have studied the relationships between corporate governance and operational risk from various perspectives, providing diverse insights into this complex interplay. Some researchers suggest that strong corporate governance mechanisms can reduce operational risk exposure and enhance overall bank performance (Shukor et al., 2023). Others, such as Chernobai et al. (2021), focus on specific aspects of governance, like board composition and risk committee structures, and their impact on operational risk events. However, some studies, including those by Battaglia & Gallo (2017) and Jan et al. (2023), indicate that even well-established governance practices did not prevent major operational failures during the financial crisis, suggesting that there may be gaps in understanding how governance influences operational risk outcomes.

The size of a banking institution is key to understanding its operational risk management and corporate governance. Larger, more complex banks face different risks, necessitating advanced governance and risk management frameworks. The Basel Committee on Banking

Supervision (Orgeldinger 2018) has recognised the influence of size on operational risk profiles, underscoring the importance of customised approaches to risk management.

Empirical research on the correlation between firm size and operational risk reveals a complex scenario. Berger et al. (2022) indicate that larger banks may encounter more frequent operational loss events, potentially due to their intricate organisational structures and diverse operations. On the other hand, Wang et al. (2021) contend that larger banks may leverage economies of scale in risk management, thereby more effectively mitigating operational risks.

There is general agreement on the significance of governance mechanisms; however, empirical evidence regarding their direct impact on operational risk remains inconclusive and sometimes contradictory. Certain studies suggest a strong negative correlation, indicating that effective corporate governance reduces operational risk, whereas other studies find minimal to no significant impact (Younas et al., 2021). Ferrarini (2017) posits that traditional corporate governance methods may be insufficient to address the unique issues that banks face. Conversely, Chernobai et al. (2021) found that stronger corporate governance correlates with fewer operational risk events in US banks. The differences in findings highlight that the effectiveness of corporate governance in reducing operational risk may depend on contextual factors. This has led to a growing acknowledgement of the need to consider variables that could affect this relationship. One such potential variable, which has received limited attention, is firm size.

Much of the existing literature treats banks as a homogeneous group, overlooking how firm-specific characteristics affect governance-risk relationships. This is problematic given the significant differences in size, complexity, and operational scope among financial institutions (Laeven et al., 2016). Large, multinational banks face different governance challenges and risks compared to smaller, regional banks (Butler, 2016). The impact of firm size on the relationship between corporate governance and operational risk remains largely unexplored.

## **2.1. The nexus between operational risk and the moderating role of firm size on board size**

The role of firm size in moderating the relationship between board size and operational risk in banks is important but understudied. While board size has been studied as a direct factor in bank risk, the interaction

between board size, firm size, and operational risk adds complexity. Agency theory suggests larger firms need more board oversight, which may enhance the impact of board size on risk management. Empirical studies, like those by Al-Dubai & Alotaibi (2023), show that the effectiveness of board size can vary with firm size.

It has been suggested that larger banks may benefit from bigger boards due to increased monitoring capacity and diverse expertise, while smaller banks might face coordination issues with oversized boards (Vallelado & García-Olalla, 2022). Research by Karim et al. (2024) found that in large, complex firms, a larger board size was advantageous, potentially reducing risks by providing comprehensive oversight. Conversely, Merendino and Melville (2019) observed that for smaller firms, larger boards were associated with lower performance, which could be connected to higher operational risks due to inefficiencies. The hypothesis suggests that larger firms strengthen the link between board size and operational risk, implying board size plays a bigger role in risk management for large banks.

### **3. Methodology**

#### **3.1. Research method**

This study uses quantitative methods to analyse the link between corporate governance effectiveness and operational risk in banks, with firm size as a moderating factor. Corporate governance effectiveness is the independent variable, and operational risk is the dependent variable. The impact of firm size on the relationship between corporate governance and operational risk is examined using the natural logarithm of total assets as a measuring tool.

#### **3.2. Research model**

The study used panel regression, pooled OLS, fixed effect, and random effect models to explore the relationships between dependent and independent variables. The research model can be expressed as follows:

### **Model Estimation:**

$$\begin{aligned} OPR_{it} = & \beta_0 + \beta_1 BDZ_{it} + \beta_2 IND_{it} + \beta_3 BDM_{it} + \beta_4 FEX_{it} \\ & + \beta_6 BDZ \times FMZ_{it} + \beta_7 IND_{it} \times FMZ_{it} + \beta_8 BDM_{it} \\ & \times FMZ_{it} + \beta_9 FEX_{it} \times FMZ_{it} + \beta_{10} Control_{it} + \varepsilon_{it} \end{aligned}$$

Where OPR represents an operational risk, the dependent variable; BDZ, IND, BDM, and FEX are the independent variables measuring different aspects of corporate governance effectiveness; FMZ is the moderating variable; the interaction terms (e.g., BDZ × FMZ) capture the moderating effects; Firm Growth is the control variable;  $\beta_0$  is the intercept;  $\beta_1$  to  $\beta_{15}$  are the regression coefficients; and  $\varepsilon$  is the error term. This model enables the investigation of both the direct impacts of corporate governance on operational risk and the potential moderating role of firm size on these relationships.

### **3.3. Data sources and sample**

Data for this study was sourced from multiple reliable databases and institutional reports of 14 universal banks operating in Ghana from 2010 to 2022. Corporate governance data was primarily collected from banks' annual reports, proxy statements, and corporate governance reports filed with relevant regulatory bodies. Operational risk data was obtained from the ORX (Operational Riskdata eXchange Association) database, a consortium of international banks that share anonymised operational loss data. Financial data, including firm size and control variables (firm growth), was gathered from Bankscope, a comprehensive database of bank financial statements provided by Bureau van Dijk. Additional market and macroeconomic data were sourced from Bloomberg and the World Bank's World Development Indicators database to control for external factors that may influence operational risk.

The selection of these 14 banks was based on specific criteria, including continuous operation throughout the study period (2010-2022), consistent availability of board-related disclosures, and compliance with Ghana's Banking Act reporting requirements. While secondary data offers advantages in accessibility and standardisation (Bhattacharya et al., 2018), the paper acknowledges potential limitations, including reporting biases (Ross & Bibler Zaidi, 2019) and the inability to capture informal governance practices. Following Tan et al. (2023), the paper mitigates these limitations through triangulation of multiple data sources and

rigorous cross-validation of financial information against regulatory filings.

### 3.4. Variable description

**Table 1:** *Variable Description*

Variable Type	Variable Name	Description	Measurement	Studies	Data Source
Independent Variables	Board Size	Number of directors on the board	Total count of board members	de Andres & Vallelado (2008); Adams & Mehran (2012)	Annual reports, Proxy statements
	Board Independence	Proportion of independent directors	Percentage of independent directors on the board	Pathan & Faff (2013); Liu et al. (2015)	Annual reports, Corporate governance reports
	Board Meeting Frequency	Number of board meetings per year	Total count of board meetings annually	Vafeas (1999); Liang et al. (2013)	Annual reports, Corporate governance reports
	Board Financial Expertise	Proportion of board members with financial expertise	Percentage of board members with relevant financial qualifications or experience	Minton et al. (2014); Fernandes & Fich (2023)	Annual reports, Directors' biographies
Dependent Variable	Operational Risk	Measure of operational loss events	Logarithm of total operational loss amount or frequency of operational loss events	Chernobai et al. (2021); Eckert & Gatzert (2019)	ORX database, Banks' risk disclosures
Modulating Variable	Firm Size	Size of the bank	Natural logarithm of total assets	Laeven et al. (2016); Berger et al. (2014)	Bankscope, Annual financial statements
Control Variable	Firm Growth	Growth rate of the bank	Year-over-year percentage change in total assets	Erkens et al. (2012); Berger & Bouwman (2013)	Bankscope, Annual financial statements

## 4. Presentation And Discussion Of Results

### 4.1. Descriptive analysis

**Table 2:** Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
OPR	.545	.147	.23	1.01
BDZ	8.856	1.654	5	13
IND	.59	.198	0	.9
BDM	5.718	3.615	4	27
FEX	.441	.103	.2	.7
FMZ	9.46	.434	8.29	10.41
FGRTH	.011	.009	-.015	.056

Note(s): OPR = Operational risk; BDZ = Board size; IND = Board independence; BDM = Board meeting; FEX = Board financial expertise; Firm size; Firm growth.

Table 2 presents a descriptive analysis of the panel data. The results show a moderate level of operational risk (OPR), with a mean of 0.545 and a standard deviation of 0.147, suggesting a minimal variability in the bank’s OPR. The average board size (BDZ) is 8.856 members, with relatively low variability (standard deviation of 1.654). This indicates that, on average, the banks have 9 members on their boards. Board independence (IND) averages 0.59, with moderate variation (standard deviation of 0.198). The frequency of board meetings (BDM) shows considerable dispersion, as evidenced by the high standard deviation of 3.615 around a mean of 5.718 meetings. Board financial expertise (FEX) has a mean of 0.441 and low variability (standard deviation of 0.103). Firm size (FMZ) averages 9.46 with minimal variation (standard deviation of 0.434). Lastly, firm growth (FGRTH) exhibits very low growth, with an average of 0.011 and minimal variability (standard deviation of 0.009).

### 4.2. Pairwise correlations

**Table 3:** Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	VIF
(1) BDZ	1.000							1.053
(2) IND	-0.043	1.000						1.045
(3) BDM	0.136	0.105	1.000					1.107
(4) FEX	0.042	-0.178*	-0.170*	1.000				1.105
(5) FMZ	0.173*	0.002	0.243*	-0.214*	1.000			1.179
(6) FGRTH	-0.071	0.029	-0.117	0.033	-0.230*	1.000		1.063
(7) OPR	0.108	0.154*	0.383*	-0.076	-0.296*	-0.049	1.000	

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

The pairwise correlation analysis reveals some notable relationships among the variables. BDZ and IND have a very weak and insignificant negative correlation (-0.043), suggesting that changes in board size have little to no impact on board independence. FEX shows a significant negative correlation with IND (-0.178) and BDM (-0.170), indicating that increased FEX may be associated with less IND and fewer meetings. FMZ positively correlates with board meetings (0.243) and OPR (-0.296), implying that larger firms tend to have more board meetings and higher OPR. Interestingly, FGRTH is negatively correlated with firm size (-0.230) and OPR (-0.049), suggesting that as firms grow, they may experience reduced size and OPR. The VIF values, all below 1.2, suggest that multicollinearity is not a concern.

### 4.3. Panel estimates (pooled, random, and fixed effect)

*Table 4: Panel estimate pooled, random, and fixed effect of corporate governance*

Variables	Model 1 (Pooled OLS)		Model 2 (Random effect)		Model 3 (Fixed effect)	
	Coefficient	Prob	Coefficient	Prob	Coefficient	Prob
C	1.861	0.000	1.863	0.000	2.168	0.000
BDZ	-0.012	0.040	-0.012	0.037	-0.016	0.006
IND	0.075	0.106	0.075	0.105	0.082	0.101
BDM	0.018	0.000	0.018	0.000	0.018	0.000
FEX	-0.121	0.189	-0.121	0.189	-0.107	0.245
FMZ	-0.158	0.000	-0.158	0.000	-0.197	0.000
FGRTH	-1.551	0.133	-1.523	0.138	-0.506	0.633
R <sup>2</sup>	0.348		0.348		0.354	
F-test	15.493		92.916		14.788	
Prob>F	0.000		0.000		0.000	
Durbin-Watson	0.432		0.534		0.476	
Hausman test					14.309	
P-value					0.026	

*Note(s): OPR = Operational risk; BDZ = Board size; IND = Board independence; BDM = Board meeting; FEX = Board financial expertise; Firm size; Firm growth.*

Results depicted in Table 4 show that under the basic indicator approach, the constant C is found with a positive coefficient value of 1.861 with a p-value of less than 0.05. This suggests that C is significant, and if there is no independent variable or if the independent variable is zero, then the value of a dependent variable, which is operational risk, would be 1.861. The constant C value in the random effect model is a positive coefficient value of 1.863 with a p-value of 0.000, which is less than 5% and also suggests that C is significant.

The panel regression analysis examines the effects of corporate governance effectiveness on operational risk within banks, producing insightful findings that corroborate and, in some instances, challenge existing literature. The coefficient for BDZ is consistently negative and significant across all models (-0.012,  $p=0.040$  in Pooled OLS; -0.012,  $p=0.037$  in random effects; -0.016,  $p=0.006$  in fixed effects), suggesting that larger board sizes are associated with reduced operational risk. This outcome aligns with the perspective of de Neifar et al. (2020), who posit that larger boards enhance monitoring capabilities and contribute diverse expertise, thereby reducing operational risks. Conversely, this finding contradicts the argument by Settembre-Blundo et al. (2021) that oversized boards may increase operational risk due to coordination challenges. Nevertheless, our results indicate that the advantages of heightened oversight outweigh the potential disadvantages in this context.

IND shows a positive but statistically insignificant relationship with OPR across all models (coefficients ranging from 0.075 to 0.082,  $p>0.10$ ). This suggests that a higher proportion of independent directors does not significantly impact operational risk reduction. While Puni and Anlesinya (2020) emphasise the role of independent boards in enhancing oversight and reducing agency conflicts, our findings may reflect the complexities highlighted by Haddad (2023), who found that increased IND did not necessarily lead to better risk outcomes during financial crises. This insignificance could be due to independent directors lacking the specific industry knowledge necessary for effectively managing operational risks, as discussed by Daoust and Malsch (2020).

The Board of Directors Meetings (BDM) demonstrate a positive and significant effect on Operational Performance Rating (OPR) (0.018,  $p=0.000$  across all models), which contrasts with some literature suggesting that increased meeting frequency enhances risk management (Neifar et al., 2020). This finding is consistent with Vafeas (1999), who argues that an abnormal increase in meeting frequency often follows

poor performance, indicating that frequent meetings may be more reactive than proactive in addressing operational risks. Our results suggest that simply increasing the number of meetings without enhancing their effectiveness may not be sufficient in mitigating operational risk.

FEX presents a negative but insignificant relationship with OPR (-0.121,  $p=0.189$  in pooled OLS; -0.121,  $p=0.189$  in random effects; -0.107,  $p=0.245$  in fixed effects). While prior studies by Abdul Rahim et al. (2019) and Altaf et al. (2022) suggest that financial expertise among directors leads to better risk management, our results indicate that financial expertise alone may not significantly impact operational risk reduction. The multifaceted nature of operational risks necessitates a wider range of skills and knowledge beyond financial expertise, as highlighted by the Basel Committee on Banking Supervision (Orgeldinger 2018).

FMZ shows a negative and significant link with OPR (-0.158,  $p=0.000$  in pooled OLS; -0.158,  $p=0.000$  in random effects; -0.197,  $p=0.000$  in fixed effects), indicating larger banks have lower OPR. In contrast, Berger et al. (2022) observed that larger banks, due to the complexity of their operational activities, are susceptible to incurring substantial losses. However, it supports Wang et al. (2021), suggesting larger institutions gain from economies of scale in risk management, reducing OPR. This underscores the importance of strong governance and risk management systems in larger firms, as noted by Alam et al. (2020).

FGRTH shows a negative but insignificant effect on OPR (-1.551,  $p=0.133$  in pooled OLS; -1.523,  $p=0.138$  in random effects; -0.506,  $p=0.633$  in fixed effects). While not statistically significant, the negative trend suggests growing firms may employ stricter operational controls to support expansion. This insignificance might be due to variations in growth strategies and their effectiveness across different banks (Orgeldinger 2018). Table 4 shows that the Hausman test favoured a fixed effect model over a random effect model. The results from all three models in Table 4 indicate robustness and insensitivity to the model type.

In examining the panel regression results, as shown in Table 5, for the moderating effect of FMZ on the relationships between corporate governance effectiveness and operational risk, we observe an interesting role played by firm size. The coefficient for the interaction between board size and firm size (BDZ\*FMZ) is 0.000 with probabilities of 0.602 (pooled), 0.001 (random), and 0.981 (fixed), indicating that firm size does not significantly moderate the relationship between board size and

operational risk. This result aligns with the mixed findings in the literature, where the impact of board size on risk management effectiveness varies depending on the context (Karim et al., 2024).

Similarly, the interaction between board independence and firm size (IND\*FMZ) is 0.004 (pooled and random) and 0.000 (fixed) with corresponding probabilities of 0.433, 0.432, and 0.006, respectively, showing non-significance in the pooled and random effects models but significance in the fixed effects model. This suggests that in larger firms, board independence may play a more critical role in managing operational risk, supporting the notion that independent directors are more effective in complex organisational settings (Mobbs et al., 2021). The interaction between board meeting frequency and firm size (BDM\*FMZ) has coefficients of 0.001 (pooled and random) and 0.002 (fixed), with all models showing significance at  $p < 0.001$ . This indicates that more frequent board meetings are particularly beneficial in larger banks. This finding is consistent with Brogi and Lagasio (2019), who emphasise the importance of regular oversight in complex institutions. The interaction between board financial expertise and firm size (FEX\*FMZ) has non-significant coefficients of -0.014 (pooled and random) and -0.012 (fixed), with probabilities around 0.230, indicating no significant difference in the advantage of financial expertise between large and small banks. This reflects a lesser need for sophisticated financial oversight in smaller banks (Meslier et al., 2020). Lastly, FGRTH shows non-significant coefficients of -0.167 (pooled and random) and -0.487 (fixed), with probabilities of 0.885 and 0.674, suggesting growth rates do not significantly affect operational risk.

**Table 5** Panel estimates for the moderating role of firm size

Variables	Pooled		Random		Fixed	
	Coefficient	Prob	Coefficient	Prob	Coefficient	Prob
C	0.529	0.000	0.529	0.000	0.470	0.535
BDZ*FMZ	0.000	0.602	0.000	0.001	0.001	0.981
IND*FMZ	0.004	0.433	0.004	0.432	0.000	0.006
BDM*FMZ	0.001	.000	0.001	0.000	0.002	0.000
FEX*FMZ	-0.014	0.230	-0.014	0.228	-0.012	0.261
FGRTH	-0.167	0.885	-0.167	0.885	-0.487	0.674
R <sup>2</sup>		0.139		0.139		0.225
F-test		5.661		28.304		9.442
Prob>F		0.000		0.000		0.000
Durbin-Watson		0.632		0.702		0.592
Hausman test					-4.035	
P-value					0.887	

#### **4.4 Test for serial correlation**

In the regression model using the Breusch-Godfrey Serial Correlation LM Test to assess serial correlation under the basic indicator approach, we found that the chi-square value is less than 5%, indicating a positive first-order autocorrelation in our model. To address this, we employed an AR (1) model. After estimating the equation, the F-statistic value was 0.345, with a probability F of 1.003, and the observed R-square value was 0.123 with a Prob Chi-Square of 0.744. Since the p-value is greater than 5% (0.435), we can conclude that the data is free from serial correlation issues among the variables. Consequently, our model is dynamic, not static, because the dependent variable includes lagged values.

#### **4.5. Test for heteroscedasticity**

We also assessed the presence of heteroscedasticity in our model using the Breusch-Pagan-Godfrey test under the Basic Indicator Approach. The test results show an observed R-square value of 2.003 with a p-value of 0.512. This is an indication that there is no heteroscedasticity problem in the model because the p-value is greater than 5%. Conclusively, the model is appropriate in the absence of heteroscedasticity.

### **5. Implications Of The Findings**

This study offers significant insights into agency theory, especially in the context of corporate governance and operational risk within the banking sector. By highlighting the moderating role of firm size, it challenges the traditional one-size-fits-all approach to governance practices. This nuanced perspective suggests that governance mechanisms' effectiveness can vary greatly depending on the size of the financial institution, making agency conflicts and governance needs more complex and context-dependent.

The emphasis on firm-specific characteristics, such as size, adds a valuable layer to our understanding of how corporate governance interacts with operational risk. This could lead to more tailored and effective governance strategies in the financial sector, ultimately refining agency theory to better reflect the diverse realities of different organisations.

The practical implications of this study are quite significant. By customising governance frameworks to the specific size and complexity

of financial institutions, regulators, managers, and policymakers may better address the unique difficulties that each bank faces. For larger banks, implementing more robust and sophisticated governance mechanisms can help mitigate operational risks more effectively. On the other hand, smaller banks might benefit from simpler, yet still effective, governance approaches.

The study's findings on the varying impact of firm size on the governance-risk relationship provide a strong foundation for developing targeted regulatory policies. These policies can enhance financial stability and resilience across various types of banks, ensuring that governance structures are well-suited to manage operational risks. This tailored approach can ultimately contribute to a safer and more stable banking system.

These recommendations are quite insightful and practical. Adopting size-specific governance approaches can significantly enhance the effectiveness of risk management in banks. For larger banks, the emphasis on sophisticated board structures, specialised risk committees, and enhanced reporting mechanisms can provide the necessary oversight and control to manage complex operational risks.

For smaller banks, focusing on board quality over size and emphasising director expertise and engagement can ensure that governance remains effective without becoming overly burdensome. The idea of tiered governance frameworks that evolve with firm growth is particularly innovative. Gradually increasing board independence ratios, enhancing the frequency of risk-focused meetings, and prioritising the recruitment of directors with diverse risk management expertise can help banks adapt their governance structures as they grow.

Regulators developing size-specific governance guidelines can further support these efforts by providing a clear framework that acknowledges the varying needs of different bank sizes. This approach can lead to a more resilient and stable banking sector overall.

## **Conclusion**

The study provides a comprehensive analysis of how firm size moderates the relationship between corporate governance and operational risk in banks. The findings reveal that the impact of board size, board independence, board meeting frequency, and board financial expertise on operational risk varies depending on the size of the bank. The findings that larger banks benefit more from governance mechanisms like board

size, independence, meeting frequency, and financial expertise due to their greater need for oversight and risk management are particularly insightful. It is also reassuring that the model's tests confirm the reliability of the results by being free from serial correlation and heteroscedasticity.

Acknowledging the limitations, such as the focus on commercial banks in Ghana and potential endogeneity issues, is crucial. This may affect the generalisability of the findings to banks in other regions or financial contexts. Furthermore, while we employed pooled panel, random, and fixed effects models, potential endogeneity issues could not be entirely ruled out. Future research could benefit from exploring more advanced econometric techniques and considering additional factors like ownership structure and regulatory environment. Extending the analysis to a broader range of countries or regions would also enhance the generalisability of the findings.

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