
The Impact of Corporate Governance Characteristics of the Board of Directors on the Quality of External Auditing: An Applied Study on Cement Companies Listed in the Saudi Stock Exchange During the Period 2013-2022

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Abstract:

This study aims to test the impact of the characteristics of boards of directors as governance mechanisms on the external audit quality of cement companies size and meetings have a statistically significant positive impact on external listed on the Saudi Stock Exchange during 2013-2022. To measure the characteristics of the board of directors, reliance was placed on the board size, board meetings, and board independence. Besides, the quality of external auditing was measured by these companies receiving auditing services from the Big Four auditing firms. Logistic regression was relied upon to achieve the study objectives and test the hypotheses. Among the most important results is that board audit quality. In contrast, board independence and company size do not have a material impact on the external audit quality of these companies.

Keywords: Governance; Corporate Governance; Board of directors; External audit quality; Logistic regression.

Jel Classification Codes: G34, C10.

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1. Introduction :

The rising rate of corporate failures and the need of investors and stakeholders for reliable information has led to research interest in improving the credibility of the published financial information in financial statements. External audit quality provides honest information for investors to build their investment decisions. Corporate governance also offers disclosure and transparency for all relevant institution stakeholders. Owning integrated corporate governance systems in terms of principles and mechanisms helps reduce cases of errors and manipulation. It increases the reliability of the external auditor's performance as one of the external corporate governance mechanisms.

The board of directors is considered one of the most important mechanisms determining the quality of corporate governance systems, as it is responsible for making various decisions, overseeing, and preserving shareholders' interests. Many studies have addressed the relationship between the board of directors' characteristics and external audit quality. However, the results are still varied between studies. Therefore, this study aims to highlight the most essential characteristics of the board of directors and the extent of their impact on external audit quality. Based on the above, the following problem statement can be raised as the central question of the study:

What is the impact of the corporate governance characteristics of the board of directors on the quality of external auditing of cement companies listed in the Saudi Stock Exchange during 2013-2022?

1.1 Study Hypotheses:

To address the problem statement above, the main hypothesis has been formulated as follows:

Study Main Hypothesis: There is a statistically significant impact of the board of directors' characteristics on the quality of external auditing. This hypothesis can be divided into the following sub-hypotheses:

- H_1 = There is a statistically significant impact of the board size on the quality of external auditing.
- H_2 = There is a statistically significant impact of the number of board meetings on the quality of external auditing.
- H_3 = There is a statistically significant impact of the board of directors' independence on the quality of external auditing.

1.2 Study Objectives:

Through this study, we aim to achieve the following objectives:

- Highlight the key concepts related to corporate governance and the quality of external auditing.
- Examine the relationship between the characteristics of the board of directors and the quality of external auditing.

- Determine the impact of the corporate governance characteristics of the board of directors on the quality of external auditing for cement companies listed in the Saudi Stock Exchange during 2013-2022.

1.3 Study Methodology:

To address this topic and comprehensively understand its key aspects, the theoretical aspect relies on a descriptive approach to present various concepts related to corporate governance and the quality of external auditing. The analytical approach is used to study the relationship between the characteristics of the board of directors and the quality of external auditing. In the applied aspect, the logistic regression model was employed.

1.4 Review of literature:

This section aimed to select relevant studies that align with the research objectives. These studies vary in terms of timelines, locations, and methodologies used. They will be presented in chronological order.

❖ **(Makni, Kolsi, & Affes, 2012)**, this study aimed to identify the impact of corporate governance mechanisms on audit quality. The study used variables such as ownership of large shareholders, managerial ownership, investor ownership, board size, CEO duality, and board independence as independent variables for corporate governance. Audit quality was assessed based on the audit firm's size, reputation, experience, sectoral specialization, and the use of information technology in audit tasks.

A sample of 29 companies listed on the Tunisian stock exchange from 2005-2009 was used to achieve the study's objectives. The study's results indicated that board size, CEO duality, and the presence of large shareholders positively influence the demand for high-quality auditors. Conversely, investor ownership negatively affects the demand for higher-quality auditors. However, managerial ownership and board independence were found to have no impact on audit quality.

❖ **(Ayadi, 2013)**, this study aimed to determine the impact of corporate governance mechanisms (board of directors, audit committee, ownership structure) on audit quality, measured by audit fees and association with the Big Four audit firms. The study analyzed a sample comprising 108 French companies listed on the Paris Stock Exchange in 2004. One of the main findings, obtained through logistic regression, revealed that board meetings were the sole determinant factor affecting external audit quality measured by association with the Big Four firms. However, the rest of the studied corporate governance mechanisms did not influence audit quality.

The linear regression results in the second model, assessing audit quality using audit fees, indicated that certain governance mechanisms, such as independent directors, the presence of an audit committee, institutional ownership, and the level of indebtedness, had an impact on audit fees. On the other hand, ownership concentration and managerial ownership showed statistically insignificant negative effects on external audit quality in both models. Therefore, the study highlighted specific governance mechanisms as critical determinants

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of audit quality, including independent directors, the presence of an audit committee, along with other factors like indebtedness and the company's size, indicating that larger companies demand more extensive external audit efforts, leading to higher audit fees and subsequently enhancing audit quality.

❖ **(Khudhair, Al-Zubaidi, & Raji, 2019)**, this study aimed to identify the impact of internal and external governance mechanisms, such as board size, the proportion of non-executive members on the audit committee, the financial expertise of non-executive directors on the audit committee, and the number of audit committee meetings, on audit quality. Audit quality was measured as a dummy variable, where 1 represented companies receiving audit services from the Big Four audit firms and 0 otherwise. The study was conducted on a sample of non-financial Iraqi companies. Binary logistic regression was employed to achieve the study objectives and test its hypotheses.

The study revealed a statistically significant positive relationship between audit quality and the proportion of non-executive members on the audit committee. Additionally, the results indicated a positive relationship between the financial expertise of non-executive directors on the audit committee, audit committee meetings, and audit quality. However, these relationships were not statistically significant. Furthermore, the study found a negative relationship between board size and audit quality.

❖ **(ALAWAQLEH, ALMASRIA, & ALSAWALHAH, 2021)**, this study aimed to test the impact of board size, board independence, CEO duality, and CEO tenure on audit quality using a sample comprising 325 manufacturing companies listed on the Amman Stock Exchange over five years from 2014 to 2018. Binary logistic regression was employed to achieve the study's objectives.

The study's results indicated a statistically insignificant negative effect of CEO duality, CEO tenure, and board independence on audit quality. Moreover, the results highlighted a statistically significant positive impact of board size on audit quality.

❖ **(Al-Hamadeen et al., 2021)**, this study identified how the board of directors (board independence, board size, CEO duality, board meetings, managerial ownership, board expertise, gender diversity of board members) impacts external audit quality measured by the association with the Big Four audit firms, audit fees, auditor tenure, and the size of the audit firm. The study was conducted on a sample comprising 45 companies listed on the Jordan Stock Exchange from 2014-2018.

The study's results indicated a positive influence of board independence and size on audit quality. Conversely, CEO duality was found to have a negative impact on audit quality. However, the rest of the board characteristics showed no significant association with external audit quality measures.

1.5. Study contribution

This study is different from previous studies, as it was applied to cement companies listed on the Saudi Stock Exchange, and thus differs in terms of economic, legal, and cultural environment. Etc. A study (Makni, Kolsi, & Affes, 2012) was applied in Tunisia, a study (Ayadi, 2013) was applied on the Paris Stock Exchange and a study (Khudhair, Al-Zubaidi, & Raji, 2019) was applied in Iraq. THE STUDY OF (ALAWAQLEH, ALMASRIA, & ALSAWALHAH, 2021) AND (AL-HAMADEENAND ALL, 2021) WAS ALSO APPLIED AT THE JORDAN ASSE.

Our study agreed with previous studies in terms of data collection and the method used of logistic regression.

1.6. Study parts: To achieve the study's objectives, we divided our research into the following axes:

- ❖ **First:** The theoretical framework of the study;
- ❖ **Second:** The methodological framework of the study;
- ❖ **Third:** The applied study;

2. The theoretical framework of the study

2.1. Concept of Corporate Governance:

Corporate governance has garnered attention from various organizations and researchers, resulting in several definitions. The following definitions the most important:

Cadbury presented one of the widely circulated definitions of corporate governance in his report, defining it as "the system by which companies are directed and controlled" (International Finance Corporation, 2002).

The Organisation for Economic Cooperation and Development (OECD) defined it as "a set of relationships between a company's management, its board, its shareholders, and other stakeholders. Corporate governance also provides the structure through which the company's objectives are set, and the means of attaining these objectives and monitoring performance" (Organisation for Economic Cooperation and Development, 1999)

Based on the definitions above, corporate governance can be defined as follows: It is the approach through which a company seeks to preserve the rights of all stakeholders, including shareholders, creditors, investors, and others, ensuring equal treatment among them and safeguarding their interests. It is a system of oversight and direction aimed at achieving the organization's long-term strategic objectives in a manner that satisfies all stakeholders.

2.2 Quality of external auditing

The study conducted by researcher DeAngelo in 1981 stands among the pioneering works that contributed to crystallizing the concept of audit quality. According to this study, *audit quality* is defined as: "The market's assessment of the likelihood that a specific auditor will discover a material error in the client's

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accounting system, report it, the likelihood that a specific auditor will fail to discover a breach in the technological capabilities of the auditor, the audit procedures used in a specific audit, the extent of sampling, and the conditional probability of reporting a discovered breach as a measure of the auditor's independence from a specific client"(DeAngelo, 1981, p. 186).

A definition of audit quality was presented by the United States General Accounting Office (GAO) as: "The auditor's performance of the audit in accordance with generally accepted auditing standards (GAAS) to provide reasonable assurance that the audited financial statements and related disclosures are presented in accordance with generally accepted accounting principles (GAAP), and that there are no material misstatements, whether due to error or fraud"(General Accounting Office GAO, 2003, p. 13).

Therefore, a definition of audit quality can be given as: "The auditor's ability to detect errors and deviations through conducting the auditing process, from planning to gathering evidence, etc., in accordance with auditing standards, reporting them, taking timely actions, and providing authenticated information to users."

2.3 The Characteristics of the Board of Directors and External Audit Quality

2.3.1 Board Size and External Audit Quality

The board of directors is a vital part of corporate governance mechanisms. Board size refers to the total number of members on the board and is among the key attributes used to measure the performance quality of the board. Several studies have aimed to identify the optimal size for board effectiveness a smaller or larger board more effective? Results across studies remain diverse.

For instance, (Makni, Kolsi, & Affes, 2012) suggest that a larger board size significantly impacts the selection of a high-quality auditor. Their study indicated that an external auditor can serve multiple purposes, such as improving internal control, financial report reliability, and resolving conflicts and alliances among board members. Consequently, as the board size increases, the issue of information inconsistency also grows. Therefore, board members choose a high-quality auditor to provide reliable information and alleviate inconsistency. Conversely, (Khudhair, Al-Zubaidi, & Raji, 2019) study found a negative impact of board size on audit quality. However, other studies, like (Ayadi, 2013), have found no statistically significant relationship between audit quality and board size.

2.3.2 Board Meetings and External Audit Quality

Numerous studies have delved into the relationship between board meetings and audit quality. For instance, (Ayadi, 2013)suggests that an active board of directors will likely choose an external auditor affiliated with one of the "Big Four" auditing firms. This study found that board meetings positively impact audit quality

measured by affiliation with a global "Big Four" firm. Another study indicates that an increase in the number of board meetings is an indicator of adequate audit quality. (Al-Hamadeen and all, 2021) found that the board size positively influences audit quality.

2.3.3 Board Independence and External Audit Quality

Board independence and external audits serve as integrated mechanisms for oversight. External board members exhibit higher independence and objectivity levels than executive members, leading to improved audit quality (O'sullivan, 2000). Several studies have confirmed that an independent board positively affects audit quality. Independent board members demand high-quality audit services to safeguard their reputation and shareholder interests more effectively. (Al-Hamadeen and all, 2021) concluded a statistically significant positive impact of board size on audit quality. However, contrary studies by (Ayadi, 2013) and Makni, Kolsi, & Affes (2012) found that board independence negatively affects audit quality. They interpreted this as independent members being an effective governance mechanism in the company, potentially reducing the risks of financial accounting errors thus decreasing the demand for high-quality audit services.

3. the Study Methodological Framework

3.1 Study Population: The study comprises the total cement companies listed on the Saudi stock exchange during the period from 2013 to 2022, encompassing 14 companies: (Hail Cement, Najran Cement, Medina Cement, Northern Cement, Umm Al Qura Cement, Arabian Cement, Yamama Cement, Saudi Cement, Southern Cement, Qassim Cement, Yanbu Cement, Eastern Province Cement, Tabuk Cement, and Jouf Cement).

3.2 Sources for obtaining study data: We obtained data from financial statements and board reports for 2013-2022 by visiting these companies' websites. Additionally, we relied on the Saudi Stock Exchange website since these companies are listed there.

3.3 Data Analysis Method: Logistic Regression:

logistic regression was used to analyze the data in the study. It refers to a model that is used to predict the probability of the occurrence or non-occurrence of a specific event or the presence or absence of a certain phenomenon. Logistic regression uses several predictor variables that can be numerical or categorical (Sahar & Rawaby, 2017, p. 172). The logistic regression model is built on the fundamental assumption that the dependent variable (p), the response variable under study, is a binary variable following a Bernoulli distribution, taking the value of (1) with a probability $(1-p)q=$ and the value of (0), denoting the occurrence or non-occurrence of the response (Faisal N, 2015, p. 91).

3.4 Study variables and their measurement:

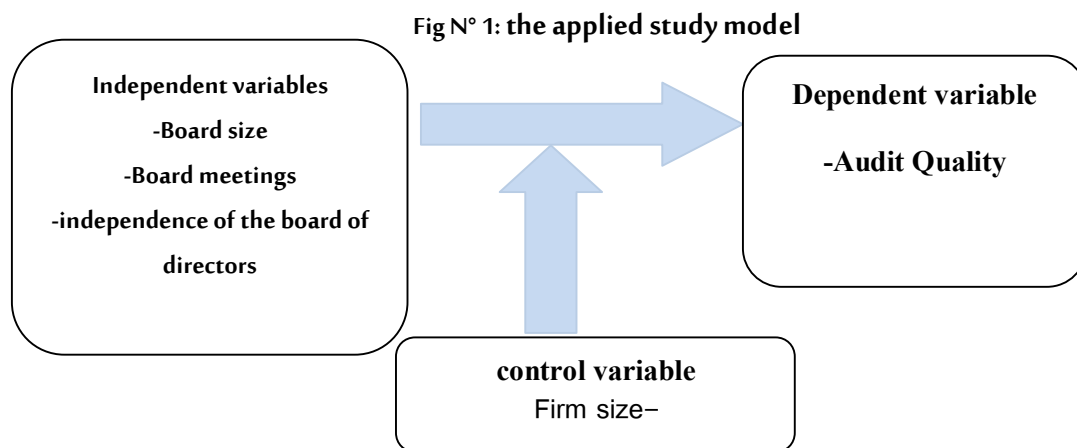
To measure the governance characteristics of the board of directors, reliance was placed on the size of the

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board, board meetings, and board independence as independent variables. As a measure of the dependent variable, the quality of auditing, these companies contracted with one of the major global auditing firms, known as the BIG4:

- Deloitte
- PriceWaterhouseCoopers [PwC]
- Ernst & Young [EY]
- Klynveld Peat Marwick Goerdeler [KPMG]

The company size was considered a control variable, assumed to have a significant impact on the quality of auditing based on prior research findings, contributing to enhancing the study outcomes. The following figure and table illustrate the study variables, their measurements, and the applied study model, respectively.



Source: Prepared by the researcher based on previous studie

Table N°1:Study variables and their measurement

variable name	Measurement	Previous studies
Independent variables		
Board size (BS)	Board of directors number	(Mustafa et all, 2018) (SAIDU & AIFUWA, 2020) (Makni, Kolsi, & Affes, 2012) (AyadWafa Masmoudi,2013) (Khudhair, Al-Zubaidi, & Raji, 2019)
)BM(Board meetings	Broad meetings number per year	(AyadWafa Masmoudi,2013) (Al-Hamadeen and All, 2021)
Independence of the board of directors (IND)	the percentage of non-executive directors in the audit committee	(Makni, Kolsi, & Affes, 2012) (ALAWAQLEH, ALMASRIA, & ALSAWALHAH, 2021)(Al-Hamadeen and All, 2021)

Dependent variable		
Audit Quality (AUDQ)	A dummy variable of 1 if the company is audited by any of the big 4 and 0, if otherwise	(Makni, Kolsi, & Affes, 2012) (Al-Hamadeen and All, 2021) (AyadWafa Masmoudi, 2013)
control variable		
Firm size (FS)	The variable firm size is measured by the natural log of the firm's total assets.	(AyadWafa Masmoudi, 2013)

Source: Prepared by the researcher based on previous studies

4. Applied Study

4.1 Descriptive Statistics of Study Variables

This section presents the descriptive statistics concerning the study variables, including mean, standard deviation, high, and low values, as shown in the following table.

Table N°2: Descriptive statistics for independent and control variables.

The variables	control variable	Dependent variables		
	LogFs	INDP	BM	BS
Obs	140	140	140	140
Moyenne	14,76	0,69	5,17	8,41
Ecart type	0,46	0,21	1,61	1,70
Maximum	15,66	0,143	10	11
Minimum	12,5	1	2	5

Source: Prepared by the researcher based on the outputs of EXCEL

From the previous table, we observe that the number of board members ranges from 11 to 5, while the mean board size for these companies is 8.41 with a standard deviation of 1.70. Board meetings are limited between 10 and 2, and the mean number of board meetings for these companies is 5 meetings per year, approximately one meeting every two months, which is considered good for monitoring and overseeing activities, with a standard deviation of 1.03. Regarding the independence of the board of directors, the mean independence ratio was 0.69 with a standard deviation of 0.21, indicating that these companies are approaching the average level of independence. The size of the companies, measured by the natural logarithm, was 14.76 with a standard deviation of 0.46, indicating that the mean company sizes are relatively consistent.

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Table N°3: Descriptive statistics for the dependent External Audit Quality

Observed		Number of firms	Percentage
Audit firm size	Big four	49	35%
	No-big four	91	65%

Source: Prepared by the researcher based on the outputs of EXCEL

Table 03 illustrates that 35% of the companies contract with the global auditing firms, the Big4, while 65% of the companies under study engage with local audit firms.

4.2 Diagnostic Tests for the Validity of the Logistic Regression Model

4.2.1 Multicollinearity Test

The assumption of no correlation between the explanatory variables is a prerequisite for the validity of the logistic regression model. Below are the results of the Variance Inflation Factor (VIF) test, which detects multicollinearity issues among the independent variables.

Table N°4: Multicollinearity Test results

Variable	VIF	1/VIF
BS	1,369	0,730
BM	1,049	0,953
IND	1,081	0,925
logFS	1,373	0,729

Source: Prepared by the researcher based on the outputs of SPSS V 25

From the results in the above table, we find that the Variance Inflation Factor (VIF) for the independent variables is less than 10. Therefore, we conclude that there is no multicollinearity issue.

4.2.2 Chi-Square Test Results for Model Significance:

This test measures the significance of differences between the logarithm values of the likelihood function for the logistic regression model with and without the independent variables. The model is significant if the significance level (P-value) is lower than the predetermined significance level set by the researcher. (Nourelhouda, 2022/2023, pp. 182-183).

Table N°5: Chi-Square Test Results

Omnibus test	
Chi-square	29,326
Sig	0,000

Source: Prepared by the researcher based on the outputs of SPSS V 25

The Chi-Square value at 4 degrees of freedom and a significance level ($\text{sig}=0.000 < 0.05$) indicates that the statistical model is statistically significant. The variables included in the model impact the quality of the audit.

4.2.3 Results of the Hosmer and Lemeshow Test for Goodness of Fit:

This test determines whether the model adequately represents the data, employing the Chi-Square test for goodness of fit to assess the differences between observed and expected values. (Nourelhouda, 2022/2023, p. 183).

Table N°6: Hosmer and Lemeshow Test Results

Hosmer and Lemeshow Test	
Chi-square	8,003
Sig	0,433

Source: Prepared by the researcher based on the outputs of SPSS V 25

It is evident that the Chi-Square value at 8 degrees of freedom and a significance level ($\text{sig}=0.443 > 0.05$) indicates that the model fits the study data well and adequately represents the data.

4.2.4 Hypothesis Testing:

To test the hypotheses of the study, we applied the logistic regression model according to the following equation:

$$Y_{it} = \beta_0 + \beta_1 \text{BSIZE}_{it} + \beta_2 \text{BM}_{it} + \beta_3 \text{INDD}_{it} + \beta_4 \log \text{FSIZE}_{it} + \varepsilon_{it}$$

Where:

Y_{it} : Dependent variable, audit quality, taking only two values: (1) if the audit firm is one of the (4 BIG) and (0) otherwise.

BSIZE: Board size

BM: Board meetings

INDD: Board independence

LogFSIZE: Natural logarithm of total assets

t: Time factor from 2013 to 2022

i: Number of sections from 1 to 10

ε_{it} : Random error term for unit t and period i

Table N°7: Results of Analysis Logistic Regression

Logistic model Variables	Coefficients β	S.E.	Wald	Df	Sig.
BS	0,456	0,153	8,932	1	0,003
BM	0,441	0,135	10,611	1	0,001
IND	-1,357	0,96	2,001	1	0,157
LogFS	0,432	0,517	0,699	1	0,403
Constant	-12,336	7,288	2,865	1	0,091

Source: Prepared by the researcher based on the outputs of SPSS V 25

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From the preceding table, we note the following:

- **Board Size:** We observe a P-value of 0.003, less than the significance level of 0.05. Additionally, the coefficient is positive. This signifies that as the board size increases, there is a higher likelihood of engaging a global audit firm. This can be explained by the notion that as the board size increases, the issue of information inconsistency grows. Consequently, board members tend to opt for a high-quality auditor who provides reliable information, alleviating the problem of information inconsistency. This result aligns with studies conducted by (Makni, Kolsi, & Affes, 2012), (Al-Hamadeenand all, 2021), (ALAWAQLEH, ALMASRIA, & ALSAWALHAH, 2021). Conversely, the study by (Khudhair, Al-Zubaidi, & and Raji, 2019) found a negative impact of board size on audit quality.

- **Board Meetings:** We observe a P-value of 0.001, which is less than the significance level of 0.05, with a positive coefficient. This indicates that an increase in board meetings positively affects audit quality. This result can be interpreted as frequent meetings evidence of an effective board. The studied firms hold approximately six meetings per year, roughly one meeting every two months, sufficient for monitoring the institution's activities and needs. All of this influences the selection of highly experienced audit firms. This finding aligns with the study conducted by (Ayadi, 2013). However, the study by (Al-Hamadeenand all, 2021) concluded that board meetings have no impact on audit quality.

- **Board Independence:** We find a P-value of 0.157, which is higher than the significance level of 0.05, with a negative coefficient. This suggests that an increase in board independence negatively affects external audit quality, although this impact is insignificant. This result can be interpreted as independent members being an effective governance mechanism in the company, potentially reducing the risks of financial accounting errors thereby reducing the demand for quality audit services. This aligns with the studies conducted by (Ayadi, 2013),(ALAWAQLEH, ALMASRIA, & ALSAWALHAH, 2021),(Makni, Kolsi, & Affes, 2012). However, the study by (Al-Hamadeenand all, 2021) concluded that board independence positively affects audit quality.

- **Company Size:** We note that the P-value is 0.403, which is greater than the significance level of 0.05. Additionally, the positive coefficient indicates that company size is not significantly correlated with audit quality. This aligns with the study conducted by (Ayadi, 2013).

5. Conclusion:

Through this study, we aimed to test the impact of board characteristics on the quality of external auditing for cement companies listed on the Saudi Stock Exchange during 2013-2022. The study resulted in the following findings:

- There is a statistically significant positive impact of board size on the quality of external auditing, indicating that an increase in board size enhances auditing quality.
- There is a statistically significant positive impact of board meetings on the quality of external auditing, meaning that an increase in board meetings enhances auditing quality.
- The results also demonstrated the absence of a significant impact of board independence on the quality of external auditing.

Based on these findings, the following **recommendations** are proposed:

- Conduct further research related to board characteristics, such as studying the demographic diversity of the board, including measuring the ratio of female representation, CEO duality, compensation of board members, etc.
- Research the quality of external auditing by considering other variables, such as the size of the auditing firm, auditor turnover, audit duration, and other related factors.

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7. Appendices:

Appendice N°1: Multicollinearity Test results

Coefficients ^a							
Modèle	Coefficients non standardizes		Coefficients standardisés	t	Sig.	Statistiques de colinéarité	
	B	Erreur standard	Bêta			Tolérance	VIF
(Constante)	-2,117	1,324		-1,599	,112		
BS	,084	,025	,300	3,319	,001	,730	1,369
BM	,084	,023	,282	3,562	,001	,953	1,049
IND	-,261	,180	-,116	-1,450	,149	,925	1,081
logFS	,102	,093	,100	1,100	,273	,729	1,373

a. Variable dépendante : BIG4

Appendice N°2: Chi-Square Test Results

Tests composites des coefficients du modèle				
		Khi-carré	Ddl	Sig.
Pas 1	Pas	29,326	4	,000
	Bloc	29,326	4	,000
	Modèle	29,326	4	,000

Appendice N°3: Hosmer and Lemeshow Test Results

Test de Hosmer et Lemeshow			
Pas	Khi-carré	ddl	Sig.
1	8,003	8	,433

Appendice N°4: Results of Analysis Logistic Regression

Variables de l'équation							
		B	E.S	Wald	ddl	Sig.	Exp(B)
Pas 1 ^a	BS	,456	,153	8,932	1	,003	1,578
	BM	,441	,135	10,611	1	,001	1,554
	IND	-1,357	,960	2,001	1	,157	,257
	logFS	,432	,517	,699	1	,403	1,541
	Constante	-12,336	7,288	2,865	1	,091	,000

a. Introduction des variables au pas 1 : BS, BM, IND, logFS.