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Research paper

The Effectiveness of Internal Control Tested by The Characteristics of The Company and Its Manager: A Study Carried Out on A Sample of Moroccan Companies Listed on The Casablanca Stock Exchange

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Abstract

Following the multiple accounting and financial scandals that have shaken the American and European stock markets, several measures have been taken by the public authorities to improve financial transparency, ensure the security of savers and investors, and restore confidence in the financial markets. At the organizational level, the Committee on Sponsoring Organizations of the Treadway Commission (COSO) has proposed a framework to ensure that assets are protected and that all of the company's activities comply with its policies and procedures.
The characteristics of the manager and the company play an important role. This paper seeks to examine the effect of the characteristics of the company and its manager on the effectiveness of internal control. It presents the results of a study carried out on a sample of 36 Moroccan companies listed on the Casablanca Stock Exchange to test the empirical validity of the hypotheses formulated following a literature review. The regression results confirm the positive effect of firm size, age, and financial health as the main characteristics of the firm on the effectiveness of internal control. On the other hand, the effect of manager characteristics remains mixed due to the family nature of listed Moroccan firms.

Keywords: *Internal Control Effectiveness; Business Characteristics; Financial Health; Chief Executive Officer Age; Entrenchment. T.*

1. Introduction

Following numerous financial scandals that shook American corporations in the late 1990s and early 2000s, the United States enacted the Sarbanes-Oxley Act (SOX) on July 30, 2002. A year later, France introduced the Financial Security Act (LSF). One of the common and innovative provisions of both laws is the requirement for senior management to assume responsibility for establishing and evaluating an internal control system, which must also be assessed by an independent auditor. This requirement reflects the legislator's confidence in the role of internal control in preventing financial scandals, as well as its effectiveness as a governance tool. Internal control has since become a cornerstone of corporate governance, aimed at improving organizational performance through efficient procedures while ensuring the protection of company assets (Thabit, Alan, & Muath T., 2017; Qiang et al., 2018; Yu-Tzu et al., 2019; Alqudah et al., 2023; María Teresa, 2024).
Since every business activity involves inherent risks, internal control seeks to mitigate—though not eliminate—these risks. Thus, its goal is to manage risks associated with corporate activities while ensuring that operations are conducted in a secure and efficient manner. Another key objective of internal control is to ensure the reliability of financial information. An effective internal control system should provide comprehensive and credible financial reporting. According to the Internal Control-Integrated Framework (COSO, 2013), internal control is a process designed to provide reasonable assurance regarding the achievement of organizational objectives. The effectiveness of an internal control system is therefore measured by the level of assurance it provides: the higher the degree of assurance, the more effective the system (Thabit, Alan, & Muath T., 2017; Basannang et al, 2024; María Teresa, 2024; Cao et al, 2024).

This study examines the impact of company and managerial characteristics on the effectiveness of internal control. Specifically, the research aims to answer the following question: To what extent do the characteristics of a company and its manager affect the effectiveness of internal control in Moroccan companies listed on the Casablanca Stock Exchange?

2. Literature Review and Hypothesis

Internal control refers to the set of procedures established by management to protect assets and ensure compliance with company policies and regulations (Radebaugh et al, 2006; Doyle, Ge, & McVay,2007; Beneish, Billings, & Hodder, 2008; Horngren et al.,2012; Nehari Talet, 2014; Qiang et al., 2018; Puryati & Febriani, S., 2020; María Teresa, 2024). The Committee of Sponsoring Organizations of the Treadway Commission (COSO), in collaboration with various stakeholders advocating for effective internal control systems, developed a reference framework to assist organizations in designing and evaluating control mechanisms that address a broad range of risks (Husnawati et al., 2017; Qiang et al., 2018; María Teresa, 2024).

Rather than functioning as an independent system within a company, internal control should be integrated into the organization's broader management and regulatory processes (Radebaugh, Gray, & Black, 2006; Doyle, Ge, & McVay,2007; Beneish, Billings, & Hodder, 2008; Horngren, et al.,2012; Kaur & Rather, 2023; Nehari Talet, 2014; Husnawati et al., 2017; Qiang et al., 2018; Yu-Tzu et al., 2019; Puryati & Febriani, S., 2020). Since internal control relies heavily on human intervention, the effectiveness of control activities is directly influenced by the personnel responsible for implementing them. Establishing an effective internal control system is therefore a shared responsibility among all managers. Senior management is particularly responsible for setting objectives, designing control mechanisms, and assessing their efficiency.

However, even the most well-designed internal control system cannot eliminate risks or guarantee the absolute achievement of all corporate objectives. Internal control can only provide reasonable assurance, not absolute certainty, that the company's objectives will be met. Implementing and maintaining an effective internal control system has been a key driver for companies to produce transparent and reliable financial reports. This objective can be achieved if internal controls are robust enough to prevent material misstatements or ensure their detection and correction before the publication of financial statements (Beneish et al, 2008; Hogan & Wilkins, 2008; Husnawati et al., 2017; Yu-Tzu et al., 2019; Fernandhytia et al., 2020; Marciano et al., 2021; Wijayanti & Setyawan, 2022).

According to the Securities and Exchange Commission (SEC), a material weakness is defined as:

"A deficiency or combination of deficiencies in internal controls over financial reporting such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis by the company's internal controls."

The presence of one or more deficiencies in a company's internal control procedures is therefore considered an indicator of poor financial reporting quality (SEC, 2017; Husnawati et al., 2017; Qiang et al., 2018; Dharmawati et al., 2022). In the most recent Committee of Sponsoring Organizations (COSO) Framework, published in 2013, internal control is defined as:

"A process implemented by the board of directors, management, and other personnel, designed to provide reasonable, not absolute, assurance that the enterprise will achieve its objectives of effectiveness and efficiency of operations, reliability of financial reporting, and compliance with laws and regulations."

This definition emphasizes that internal control does not guarantee absolute certainty, but rather provides a reasonable level of assurance that corporate objectives will be met in a structured and controlled environment (Qiang et al., 2018; Fernandhytia et al., 2020; Dharmawati et al., 2022; Andrew J. et al., 2023; María Teresa, 2024).

2.1. Characteristics of the management body as determinants of the effectiveness of internal control

Several studies have examined the impact of certain managerial characteristics on the effectiveness of internal control. Researchers have focused on factors such as manager compensation, entrenchment, and age, all of which can influence managers' behavior toward control activities (Jensen, 1993; Ashbaugh-Skaife, Collins, & Kinney Jr., 2007; Gumb & Noel-Lemaître, 2007; Young, Yura, & Hyun-Dong, 2017; Marciano et al., 2021; Wijayanti & Setyawan, 2022; Andrew J. et al., 2023).

The results of these studies indicate that when shareholder-managers hold a significant stake in the company's capital, it negatively affects the quality of internal control. This occurs due to the power they possess within the company, leading to riskier decision-making (Chen & Steiner, 1999; Ginger, 2002; Gumb & Noël-Lemaître, 2007; Husnawati et al., 2017; Young, Yura, & Hyun-Dong, 2017; Puryati & Febriani, S., 2020).

Because internal control is tied to management philosophy, shareholder-managers with large stakes are more likely to implement ineffective control procedures (Ogneva, Subramanyam, & Raghunandan, 2007; Gumb & Noël-Lemaître, 2007; Wang, 2015; Young, Yura, & Hyun-Dong, 2017; Dharmawati et al., 2022; Andrew J. et al., 2023).

H1: The ownership of a significant share of capital by the CEO negatively affects the effectiveness of internal control

Other studies have shown a negative relationship between CEO tenure and firm performance. These studies suggest that the longer the CEO's tenure, the more power they tend to accumulate within the firm, making them less vulnerable. Consequently, the entrenchment of CEOs over time can lead to the adoption of less effective internal control procedures (Pigé, 1998; Ginglinger, 2002; Gumb & Noël-Lemaître, 2007; Wang, 2015; Husnawati et al., 2017; Young, Yura, & Hyun-Dong, 2017; Puryati & Febriani, S., 2020).

H2: Managerial entrenchment negatively impacts the effectiveness of internal control

Some research suggests that older individuals demonstrate greater organizational commitment and are more dedicated to achieving organizational goals. These studies show that older and younger employees within a company exhibit different attitudes toward organizational commitment (Gumb & Noël-Lemaître, 2007). In this context, age may influence the effectiveness of the internal control systems implemented by senior management. Following the enactment of SOX 404, older managers, considered more committed to the organization, are likely to focus on improving the internal control system (Pigé, 1998; Ginglinger, 2002; Gumb & Noël-Lemaître, 2007; Wang, 2015; Husnawati et al., 2017; Young, Yura, & Hyun-Dong, 2017; Puryati & Febriani, S., 2020).

H3: The age of the manager has a positive effect on the effectiveness of internal control.

2.2. Business characteristics as determinants of internal control effectiveness

Several studies have focused on firm size as a determinant of internal control effectiveness. In large firms, there is often enough employees, along with established procedures and processes, to ensure better separation of tasks. Large firms are thus likely to have more robust control

systems. However, some researchers argue that as firms grow, the internal control system may deteriorate due to its size (Krishnan, 2005; Wang, 2015; Kaur et al, 2023; Young, Yura, & Hyun-Dong, 2017; Qiang et al., 2018; Yu-Tzu et al., 2019; Puryati & Febriani, 2020; Fernandhytia et al., 2020; Andrew J. et al., 2023).
H4: Firm size positively affects the effectiveness of internal control
Other research suggests that the age of a firm may also play a role in determining the effectiveness of internal control. Studies have shown that older firms tend to have fewer internal control weaknesses. In other words, older firms are more likely to have better control over their operations (Cappelletti, 2006; Gopal V. & Wei, 2012; Wang, 2015; Jahmani & Niranjan, 2016; Young, Yura, & Hyun-Dong, 2017; Husnawati et al., 2017; Qiang et al., 2018; Yu-Tzu et al., 2019; Puryati & Febriani, S., 2020; Fernandhytia et al., 2020; Andrew J. et al., 2023).
H5: Firm age positively impacts the effectiveness of internal control
The financial health of a firm is another important determinant of internal control effectiveness. Research indicates that poorly performing firms may not have the resources or time to invest in implementing effective controls (Cappelletti, 2006). Effective internal control requires both financial resources and managerial attention, which may not be available for firms primarily concerned with survival. Studies show that financial performance is negatively associated with financial reporting errors (DeFond & Jiambalvo, 1991), and firms with financial losses tend to exhibit more internal control weaknesses (Krishnan, 2005; Wang, 2015; Young, Yura, & Hyun-Dong, 2017; Qiang et al., 2018; Yu-Tzu et al., 2019; Puryati & Febriani, S., 2020; Fernandhytia et al., 2020).
H6: The financial health of the company positively affects the effectiveness of internal control

3. Research Methodology

To ensure the empirical validity of the research hypotheses derived from the literature review, we aim to test the research model outlined as follows:

$$\mathrm{QCI} = \alpha_1 \mathrm{Log(CA)}_i + \alpha_2 \mathrm{AE}_i + \alpha_3 \mathrm{RE}_i + \alpha_4 \mathrm{PDK}_i + \alpha_5 \mathrm{ENR}_i + \alpha_6 \mathrm{AD}_i + \beta + \varepsilon \quad (1)$$

Our study was conducted on a sample of companies listed on the Casablanca Stock Exchange. The final sample consists of 36 cases, after excluding companies for which data from the 2023 financial year were unavailable, particularly those related to the age and tenure of the manager. Additionally, we excluded all companies from the financial sector.
To ensure the external validity of the research, data collection was carried out using widely accepted measures commonly employed in research. The following table provides a summary of all the measures used:

Table 1: Summary of Measurements of the Research Model Variables

Variables	Measures
Internal Control Quality (ICQ)	(1) If certification with reservation (2) If certification without reservation, but including observations concerning the balances (3) If certification without reservation
Company size	$\mathrm{Log(CA)}$
Age of the company (AE)	Number of years the company has been in existence
Financial Health (RE)	$\mathrm{ROE} = \frac{\mathrm{EBE}}{\mathrm{CA}}$
Share of the manager in the capital (PDK)	Share of the manager in the company's capital in %
Leader Rooting (ENR)	Number of years of CEO responsibility within the company
Age of the manager (AD)	Age of the leader

The effectiveness of internal control was measured using a 3-point scale based on auditors' reports: (1) Low, if the certification is "with reservations"; (2) Average, if the certification is "without reservations" but includes consistent observations regarding account balances in the financial statements; (3) High, if the certification is "without reservations" and the auditors' report includes no comments.
The size of the company was measured by the logarithm of turnover. After calculations, three categories of companies were identified: (1) Small companies compared to others in the sample if Log (Revenue) is less than 9; (2) Medium-sized companies if Log (Revenue) is greater than 9 but less than 10; (3) Large companies if Log (Revenue) is greater than or equal to 10.
The age of the company was measured by the number of years since its establishment. Similarly, five categories of companies were identified based on their age: (1) Companies aged up to 15 years; (2) Companies aged between 25 and 30 years; (3) Companies aged between 32 and 39 years; (4) Companies aged between 42 and 52 years; (5) Companies aged over 60 years.
The financial health of the company was measured by operating profitability, which varies mainly according to company size and sector. Based on this, companies were categorized into three groups: (1) Companies with low operating profitability, less than 20%; (2) Companies with average operating profitability, between 20% and 40%; (3) Companies with high operating profitability, exceeding 40%.
The manager's share of the capital was used as a measure of the manager's entrenchment. Based on data on the CEO's share in the company's capital, three categories of managers were distinguished: (1) Managers with a small share in the company's capital, not exceeding 10%; (2) Managers with an average share, greater than 10% but not exceeding 40%; (3) Managers with a large share, exceeding 50%.
Finally, the manager's age was used to categorize managers into three groups: (1) Young managers, aged less than 50; (2) Managers aged between 50 and 55; (3) Managers aged over 55.
Thus, all variables in the research model are ordinal variables measured on scales ranging from three to five anchor points. The data analysis of our Multinomial Logit model was conducted using SPSS software.

4. Results and Discussions

The test of the research model reveals that the effect of the explanatory variables on the effectiveness of internal control is statistically significant at the 5% significance level. The following table, derived from the results obtained through SPSS, provides a summary of the complete test of the research model.

Table 2: Summary of the Research Model Test

Model Fitting Information				
Model	Model Fitting Criteria -2 Log Likelihood	Likelihood Ratio Tests Chi-Square	Df	Sig.
Intercept Only	70,256			
Final	1,386	68,869	30	,000

The pseudo R-square tests are also significant at the 5% significance level, indicating the robustness of the research model. In other words, the determinants identified in the literature review serve as the primary explanatory factors for the effectiveness of internal control.
Over 85% of the variability in the effectiveness of internal control can be explained by factors such as the size of the company, the age of the company, its financial health, the manager's share in the capital, their entrenchment, and their age. The following table presents the results of the internal validity test for the research model.

Table 3: Testing the Validity of the Research Model

Pseudo R-Square	
Regular	Bold
Cox and Snell	,852
Nagelkerke	,987
McFadden	,961

Regarding the significance of the coefficients in the research model, the test reveals that the effects are positive and significant at the 5% error level, except for the variable "age of the manager," which exhibits a positive but non-significant effect.

Table 4: Testing the Significance of the Coefficients of the Research Model

Likelihood Ratio Tests				
Effect	Model Fitting Criteria -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests Chi-Square	df	Sig.
Intercept	1,386a	0.000	0	
Size	16,402	15,015	4	,005
AE	39,168	37,782	8	,000
D	42,864	41,478	4	,000
PDK	12,014	10,628	4	,031
ENR	30,647	29,261	6	,000
AD	4,159b	2,773	4	,597

Thus, by maintaining an error threshold of 5%, the present study conducted on a sample of companies listed on the Casablanca Stock Exchange reveals a positive and significant effect of the selected variables on the effectiveness of internal control, except for the variable "age of the manager," which shows a positive but non-significant effect. The results of the hypothesis tests are presented in the following table :

Table 5: Summary of Research Hypothesis Tests

Research hypothesis	Results of hypothesis tests
H1. The holding of a significant share of capital by a manager-shareholder hurts the effectiveness of internal control	Hypothesis rejected
H2. The entrenchment of managers hurts the effectiveness of internal control	Hypothesis rejected
H3. The age of the manager has a positive effect on the effectiveness of internal control	Hypothesis rejected
H4. Firm size has a positive effect on the effectiveness of internal control	Hypothesis accepted
H5. Firm age has a positive effect on internal control effectiveness	Hypothesis accepted
H6. The financial health of the company has a positive effect on the effectiveness of internal control	Hypothesis accepted

Unlike studies conducted in other contexts, the research shows that a manager holding a significant share of the company's capital positively and significantly affects the effectiveness of internal control. This outcome can be explained by the specific typology of the companies in our sample. Notably, companies listed on the Casablanca Stock Exchange are predominantly family-owned. In such a context, it is understandable that shareholder-managers implement stronger and more effective control procedures, especially since their substantial stake in the family business ensures they seek to protect their investment (Puryati & Febriani, S., 2020; María Teresa, 2024).
To enhance the readability of our findings, we provide a visual representation of the relationship between firm size and the effectiveness of internal control. As shown in Figure 1, larger firms display higher levels of internal control effectiveness compared to smaller firms. This result is consistent with our regression analysis, which revealed a positive and significant effect of firm size on the robustness of internal control systems. The figure highlights the ability of larger firms to mobilize financial, human, and technological resources to establish more reliable and comprehensive control procedures. These findings reinforce the conclusion that firm size is a key determinant of internal control effectiveness in Moroccan listed companies.

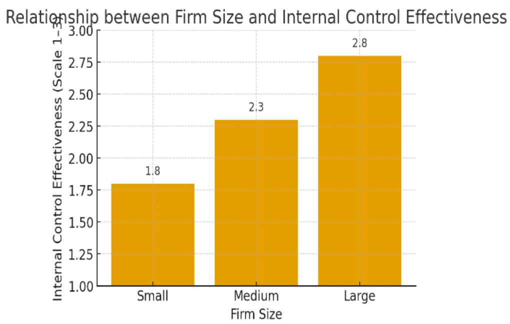

Fig. 1: Relationship between Firm Size and Internal Control Effectiveness.

Figure 1 illustrates that larger firms exhibit higher levels of internal control effectiveness compared to smaller firms. This confirms the regression results, indicating a positive and significant relationship between firm size and the robustness of internal control systems.
Furthermore, our study of the effect of managerial entrenchment on the effectiveness of internal control in the Moroccan context presents results contrary to findings from other settings. It is evident that in companies predominantly owned by families, the management team led by a family member plays a crucial role in the effectiveness of internal control systems. This entrenchment results in better oversight of company activities, especially since there is no clear separation between ownership and management. Consequently, this leads to the establishment of a more robust internal control system, as the General Manager's tenure in position typically spans several years (Dharmawati et al., 2022; Andrew J. et al., 2023).
Figure 2 summarizes the empirical findings of the study. Organizational factors such as firm size, firm age, and financial health (in green) exert a positive and significant effect on internal control effectiveness. Managerial characteristics, namely shareholding and entrenchment (in blue), also demonstrate a positive and significant influence in the Moroccan context, where family ownership predominates. In contrast, managerial age (in orange) shows a positive but non-significant effect, suggesting that other attributes such as education or professional experience may be more relevant determinants. Together, these results highlight the importance of considering both company-specific and contextual managerial factors in assessing internal control effectiveness.

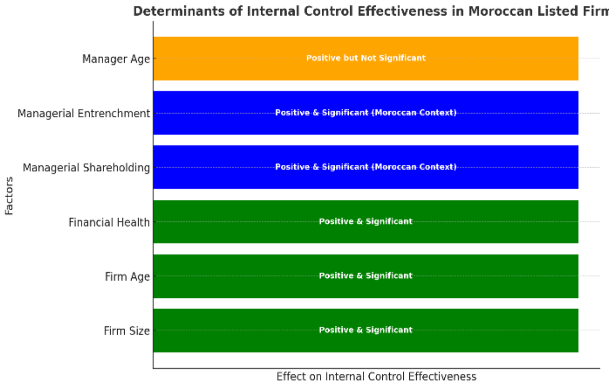

Fig. 2: Determinants of Internal Control Effectiveness in Moroccan Listed Firms.

Unlike studies conducted in other contexts, our results show that managerial shareholding and entrenchment exert a positive and significant influence on the effectiveness of internal control in Moroccan listed companies. This divergence from prior literature can be explained by the cultural and structural features of the Moroccan corporate landscape.
First, the predominance of family-owned firms on the Casablanca Stock Exchange implies a different dynamic between ownership and management. In such firms, shareholder-managers perceive the company not only as a financial investment but also as a family legacy that must be protected and transferred across generations. This intergenerational perspective reduces the likelihood of opportunistic behavior often associated with entrenched managers in non-family settings. Instead, entrenchment is viewed as a stabilizing factor that reinforces long-term strategic control and fosters stronger oversight of operations.
Second, the cultural context of Moroccan businesses is marked by close social ties, a preference for trust-based relationships, and the blending of family and corporate governance. In this environment, managerial shareholding increases accountability rather than risk-taking, as the family's financial and reputational capital are directly at stake. Entrenched leaders, often family members with long tenures, are therefore motivated to ensure effective internal control procedures that safeguard both company resources and family interests.
Finally, structural characteristics such as limited separation between ownership and management, a relatively small stock market, and regulatory frameworks that are still evolving reinforce the central role of the CEO in control mechanisms. Unlike in large Anglo-American corporations, where dispersed ownership encourages agency conflicts, the Moroccan context favors concentrated ownership, thereby aligning managerial and shareholder interests.
Taken together, these factors highlight that the positive effect of managerial entrenchment and shareholding observed in our study is not a contradiction but rather a reflection of the institutional, cultural, and structural particularities of Moroccan listed companies. This suggests that the determinants of internal control effectiveness are context-dependent and cannot be fully understood without considering the ownership structures and governance traditions of the environment in which firms operate.
The test of the research model shows that the explanatory variables significantly influence the effectiveness of internal control at the 5% threshold. The pseudo R-square values confirm the robustness of the model, indicating that more than 85% of the variability in internal control effectiveness is explained by company size, age, financial health, managerial shareholding, entrenchment, and entrenchment.
Regarding the coefficients, the results reveal that company size, company age, financial health, managerial shareholding, and managerial entrenchment exert positive and significant effects on internal control effectiveness. The only exception is managerial age, which shows a positive but non-significant effect.
The findings highlight the specific context of Moroccan listed companies, where the predominance of family-owned businesses shapes the relationship between governance and control systems. Unlike studies in other settings, our results show that managers holding a significant share of the capital contribute positively to internal control effectiveness. In family-owned firms, shareholder-managers tend to strengthen controls to protect both their financial investment and family legacy.
Similarly, managerial entrenchment, often seen as detrimental in other contexts, is found to enhance internal control effectiveness in Morocco. Long-serving family managers provide stability and continuity, fostering stricter oversight and stronger internal processes. This reflects the cultural and structural characteristics of Moroccan firms, where concentrated ownership aligns managerial and shareholder interests.
By contrast, the age of the manager does not appear to significantly influence control effectiveness. This suggests that other factors, such as education, professional background, and managerial skills, may be more relevant indicators of their impact.
The results concerning company characteristics are consistent with international evidence. Larger firms are better equipped to establish robust control mechanisms due to their human, technical, and financial resources. Older firms benefit from accumulated experience in risk management, while financially healthy companies can allocate the necessary resources to improve their control systems. Together, these factors confirm that organizational characteristics are key determinants of internal control effectiveness in Moroccan listed firms.

5. Conclusion

The objective of this study is to test the effect of the characteristics of the company and those of the manager on the effectiveness of internal control from a sample of Moroccan companies listed on the Casablanca Stock Exchange. For this purpose, this research work is structured around three main parts.
The first corresponds to a review of the literature on the determinants of the effectiveness of internal control related to the company and its manager. This step allowed us to design a research model and formulate the hypotheses that should be tested empirically. The second part seeks to clarify the methodological approach adopted, in particular the constitution of the sample, the measurement of variables, and the collection of data. The last part was devoted to the validity test of the research model and the research hypotheses, as well as the discussion of the results.
Based on an analysis of data for the 2023 financial year collected from a sample of Moroccan companies listed on the Casablanca Stock Exchange, the results show the existence of a positive and significant effect of the company's characteristics on the effectiveness of internal control, thus confirming the results of research carried out in other contexts.
The study contributes to the understanding of the role played by the characteristics of the company in the effectiveness of internal control. The results show that companies with years of experience are the most able to implement effective control procedures. The size and financial health of the company also play an important role in the effectiveness of internal control in the sense that the latter requires having an information system as well as human and financial resources. The combination of these resources and skills for the effectiveness of internal control is the capacity of large and financially efficient companies.
On the other hand, the results concerning the effect of the manager's characteristics are mixed. The importance of the manager's participation in the company's capital, his age, and his roots, seem to be variables whose effect on the effectiveness of internal control depends on the company itself. This conclusion is motivated by the particularity of the Moroccan stock market, marked by a strong presence of family businesses.
The results confirm the positive and significant role of company-related factors size, age, and financial health, in strengthening internal control. Larger, older, and financially healthier firms are better positioned to implement reliable procedures, supported by adequate resources and accumulated experience.
Conversely, the results regarding managerial characteristics are more context-dependent. Unlike findings in other markets, managerial shareholding and entrenchment have a positive influence on internal control in Morocco, largely due to the prevalence of family ownership and the overlap between management and shareholders. This highlights the importance of considering cultural and institutional contexts when analyzing governance mechanisms. The effect of managerial age, however, was found to be positive but not statistically significant, suggesting that broader managerial attributes should be investigated in future research. The results confirm the positive and significant role of company-related factors size, age, and financial health in strengthening internal control. Larger, older, and financially healthier firms are better positioned to implement reliable procedures, supported by adequate resources and accumulated experience.
Conversely, the results regarding managerial characteristics are more context-dependent. Unlike findings in other markets, managerial shareholding and entrenchment have a positive influence on internal control in Morocco, largely due to the prevalence of family ownership and the overlap between management and shareholders. This highlights the importance of considering cultural and institutional contexts when analyzing governance mechanisms. The effect of managerial age, however, was found to be positive but not statistically significant, suggesting that broader managerial attributes should be investigated in future research.

5.1. Implications

The findings of this research provide several theoretical and practical implications.
Theoretical implications. By demonstrating that firm characteristics such as size, age, and financial health significantly enhance the effectiveness of internal control, this study confirms and extends prior literature on corporate governance in emerging markets. Importantly, the positive role of managerial shareholding and entrenchment in Moroccan listed firms diverges from results in developed economies, suggesting that internal control effectiveness is highly context-dependent. This highlights the need for future research to account for cultural, institutional, and ownership structures when examining governance mechanisms.
Practical implications. For practitioners and regulators, the results underscore the importance of strengthening internal controls in smaller, younger, and financially weaker firms, which are more vulnerable to control weaknesses. Policymakers should consider designing support mechanisms, such as training and tailored regulatory guidance, to help these firms enhance their governance systems. Moreover, the evidence that entrenched family managers can contribute positively to control effectiveness indicates that regulators should adopt a nuanced approach, recognizing that ownership concentration in family businesses may reduce, rather than exacerbate, agency risks in certain contexts.
Managerial implications. For company executives, the findings suggest that investing in financial stability, information systems, and human resources is critical to ensuring effective internal control. Family-owned businesses can leverage their strong alignment of ownership and management to reinforce accountability and safeguard resources.
Overall, this study emphasizes that internal control effectiveness cannot be assessed in isolation but must be understood within the broader cultural, institutional, and organizational context in which firms operate.

5.2. Limitations and future research directions

It is important to acknowledge that this study is based on a relatively small sample of 36 Moroccan companies listed on the Casablanca Stock Exchange. While this number is consistent with prior research on emerging markets and is justified by data availability, the limited sample size inevitably constrains the generalizability of the findings. The results should therefore be interpreted with caution, as they may not fully capture the heterogeneity of all Moroccan firms, nor of companies operating in other national or regional contexts. Future research could address this limitation by expanding the sample size, incorporating data from multiple years, or conducting cross-country comparisons. Such extensions would not only improve the robustness of the results but also provide deeper insights into the extent to which the determinants of internal control effectiveness identified here are context-specific or broadly applicable.
For future research, this study opens several avenues for further investigation. First, future research could extend the analysis by using a larger sample size and multi-year data to assess the stability of the observed relationships over time. Incorporating longitudinal data would allow researchers to explore how changes in firm characteristics affect the evolution of internal control systems.

Second, comparative studies across countries or regions could provide valuable insights into the extent to which cultural, institutional, and ownership structures influence internal control effectiveness. Such cross-country analyses would help determine whether the positive role of managerial entrenchment and shareholding found in Morocco is specific to family-dominated markets or more broadly generalizable.
Third, future research could expand the set of managerial characteristics examined by including education level, professional experience, or international exposure of CEOs. These factors may interact with internal control effectiveness in ways not captured by age, tenure, and shareholding alone.
Finally, further studies could adopt a mixed-methods approach, combining quantitative analysis with qualitative interviews of executives, auditors, and regulators. Such an approach would enrich our understanding of the mechanisms through which firm and managerial characteristics shape internal control practices in emerging markets.

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Informed Consent Statement

Not applicable.

Data Availability Statement

All data generated during this study are included in this file.

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Conflicts of Interest

The authors declare no conflict of interest.

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