The Impact of Managerial Characteristics on the Effectiveness of Internal Control in Enterprises

Wenjie Cao *

School of Economics and Management, Nanjing University of Science and Technology, Nanjing, China

* Corresponding Author Email: caowenjie@njust.edu.cn

Abstract. Since the enactment of the Sarbanes-Oxley Act, internal control has gained increasing attention, highlighting its growing importance. However, in China, there remains room for improvement in the design, maintenance, and execution of internal control within enterprises. As key figures responsible for internal control, senior managers possess various internal and external characteristics that may influence its effectiveness. This study uses data from 200 randomly selected A-share listed companies on the Shanghai and Shenzhen stock exchanges in 2021. With Excel and SPSS, it analyzes the impact of different managerial characteristics on the effectiveness of corporate internal control. Findings reveal a positive correlation between characteristics like managers' age, education level, and compensation, and the effectiveness of internal control, while gender shows no significant effect on control quality. Based on these results, recommendations are offered to guide the appointment of managers and the execution of internal control, providing valuable insights for enterprises.

Keywords: Managerial Characteristics, Internal Control Effectiveness, DIB Internal Control Index.

1. Research Background

As shown in Table 1, from 2015 to 2020, the number of non-standard opinions issued in internal control audit reports for A-share listed companies has shown an overall upward trend. Notably, the proportion of adverse opinions within these non-standard opinions increased significantly, rising from 16.51% in 2015 to 41.94% in 2020. According to the Chinese Institute of Certified Public Accountants, as of April 30, 2022, 47 accounting firms issued 2021 internal control audit reports for 2,521 listed companies. Among these, 2,470 companies received unqualified audit reports (49 of which included unqualified opinions with an emphasis of matter paragraph), 48 received adverse opinions, and 3 were issued disclaimers of opinion.

The increasing number of companies receiving non-standard opinions and adverse opinions on internal control audits reflects that many internal control issues persist within China's listed companies.

Table 1. Non-Standard Opinions in Internal Control Audit Reports for Chinese Listed Companies (2015-2020)

Year	Listed Companies Issued Internal Control Audit Reports	Non-Standard Opinions	Non-Standard Opinion Ratio (%)	Unqualified Opinions with Emphasis of Matter Paragraph	Proportion of Non-Standard Opinions (%)	Qualified Opinions with Emphasis of Matter Paragraph	Proportion of Non-Standard Opinions (%)	Adverse Opinions	Proportion of Non-Standard Opinions (%)	Disclaimers of Opinion	Proportion of Non-Standard Opinions (%)
2015	2300	109	4.74	90	82.57	1	0.92	18	16.51	0	0.00
2016	2359	111	4.71	87	78.38	1	0.90	23	20.72	0	0.00
2017	2587	112	4.33	63	56.25	1	0.89	46	41.72	2	1.79
2018	2719	165	6.07	84	50.91	4	2.42	76	46.06	1	0.61
2019	2932	162	5.53	52	32.10	9	5.56	97	59.88	4	2.47
2020	3148	155	4.92	82	52.90	6	3.87	65	41.94	2	1.29

The Guidelines for the Standardized Operation of Listed Companies stipulate that company management is responsible for the effective implementation of internal control. With internal control issues prevalent among numerous listed companies, it raises the question of whether internal control design, maintenance, and execution are truly effective. Additionally, it is worth considering whether the characteristics of senior management—who are responsible for internal control—might also influence the design, maintenance, and execution of internal controls. Therefore, companies should consider managerial characteristics as a key factor when designing internal control systems. By studying the impact of these characteristics on internal control, companies can gain insights that inform the effective appointment of managers and help maximize the function of internal controls.

Based on this analysis, the study uses 2021 A-share listed companies on the Shanghai and Shenzhen stock exchanges as its sample, examining senior management characteristics as defined by the CSMAR database (including the board of directors, supervisory board, and senior executives). Focusing on five dimensions—age, gender, education level, compensation, and shareholding ratio—this research comprehensively analyzes how these characteristics of managers impact the effectiveness of internal control.

2. Literature Review

In recent years, the effectiveness of corporate internal control has been a hot topic of research. However, most studies analyze the influencing factors of internal control effectiveness from the perspectives of corporate governance and ownership structure, with only a few scholars considering the possible link between management characteristics and internal control effectiveness.

Lin Y. C. et al. (2014) studied U.S. listed companies and found a positive correlation between CEO age and the degree of internal control deficiency disclosures, suggesting that senior executive teams with a higher average age tend to build better internal controls.

Li Duansheng et al. (2017), using a sample of A-share listed companies in Shanghai and Shenzhen from 2012 to 2014, found a positive correlation between the average age and education level of management teams and internal control quality. They also suggested that the impact of the proportion of female managers on internal control should be analyzed on a case-by-case basis.

Chi Guohua et al. (2018), from the perspective of institutional change, analyzed the relationship between board characteristics and internal control deficiency disclosure. The study showed that boards with lower levels of compensation and education were more likely to exhibit opportunistic behaviors, thus performing poorly in internal control deficiency disclosures.

Zhou Luo et al. (2018) considered industry differences and categorized industries into resource-intensive, technology-intensive, capital-intensive, and labor-intensive. They studied the impact of management team educational structure on internal control quality in each category, finding that this impact varies significantly by industry; in some industries, educational level was positively correlated with internal control quality, while in others, it was negatively correlated or not significant, leading to no consensus in the academic field.

Wu Ying (2019) conducted an empirical study on managerial characteristics, company size, and internal control level, analyzing the correlations between manager age, education level, tenure, and company size with corporate value.

These findings suggest that scholars have examined both internal characteristics of management, such as age, gender, and education, and external characteristics, such as incentive levels, in relation to internal control quality. Therefore, this paper will analyze the impact of managerial characteristics on the effectiveness of corporate internal control through both internal and external traits.

3. Research Hypotheses

Corporate management consists of individuals whose decisions and actions at each level of management affect work quality, task transmission, and judgment on matters, which may lead to varied outcomes in the effectiveness of internal control. Specifically, managerial characteristics such as age, gender, education level, compensation, and shareholding ratio may influence internal control effectiveness.

3.1. Manager Age and Internal Control Effectiveness

Older managers generally tend to reduce corporate risks by strengthening internal controls. Differences in age can lead to variations in life experience and values, which, in turn, affect managers' judgments and decision-making. Older managers are relatively more risk-averse and less inclined to adopt new approaches, whereas younger managers tend to embrace risk, new ideas, and make decisions outside the original internal control framework.

Based on this, we propose the following hypothesis:

H1: The effectiveness of internal control increases with the age of the manager.

3.2. Manager Gender and Internal Control Effectiveness

Differences in thinking and psychology between male and female managers often lead to differences in management and decision-making. Women generally exhibit more cautious and stable behavior than men, with a heightened awareness of risks and problems. Given that internal control aims not only to help a company achieve its goals and stable growth but also to prevent risks and standardize processes to minimize or avoid losses, we propose the following hypothesis:

H2: Female managers have a more significant impact on internal control effectiveness, showing a positive correlation.

3.3. Manager Education Level and Internal Control Effectiveness

Differences in educational background significantly affect managers' values and cognition. Higher education levels are associated with more extensive knowledge reserves, particularly in specialized fields, enhancing problem-solving abilities. Managers with higher education levels are more attentive to the role of internal control, designing more rational control systems and effective execution processes, and are more responsive to environmental changes, improving internal controls accordingly.

Thus, we hypothesize:

H3: There is a significant positive correlation between manager education level and internal control effectiveness.

3.4. Manager Compensation and Internal Control Effectiveness

Management compensation is a form of external incentive. Listed companies typically provide short-term incentives, such as monetary compensation, and long-term incentives, like equity. The incentive system encourages self-regulation among management and aligns their interests with company goals, helping to address agency issues arising from the separation of management and ownership. According to principles of interest alignment and value resonance, a high level of compensation aligns management's values with the company's, reduces opportunistic behavior, and motivates managers to fulfill their duties in internal control effectively.

Based on this, we propose:

H4: There is a significant positive correlation between manager compensation and internal control effectiveness.

3.5. Manager Shareholding Ratio and Internal Control Effectiveness

With the development of China's shareholding and securities markets, more managers now hold company shares, which helps align management's interests with those of the company, reducing agency costs and motivating managers to maintain effective internal control. Applying panel data from listed companies in China between 2014-2016 and agency theory, Shi Bin (2019) found that employee stock ownership plans improve internal control effectiveness, with a higher managerial shareholding ratio further enhancing effectiveness.

Therefore, we hypothesize:

H5: The effectiveness of internal control increases with the manager's shareholding ratio.

4. Variable Design

4.1. Sample Selection and Data Sources

This study uses data from Shanghai and Shenzhen A-share listed companies in 2021, randomly selecting 200 samples. Data analysis and processing were conducted using Excel and SPSS 21 software. Internal control quality data was sourced from the Dibo China Listed Companies Internal Control Index, released by Shenzhen Dibo Enterprise Risk Management Technology Co., Ltd., while additional information on company executives and financial data was obtained from the CSMAR database.

4.2. Explanation of Variables

4.2.1. Dependent Variable

Internal Control Effectiveness or Internal Control Quality (IC): This variable is measured by the Dibo China Listed Companies Internal Control Index. Since the index has a maximum score of 1000, it is normalized by dividing by 10. The Dibo Internal Control Index, developed as a national key accounting research project, integrates five core corporate objectives: lawful and compliant operations, asset security, the authenticity and completeness of financial reports and related information, operational efficiency and effectiveness, and the realization of corporate development strategy. Additionally, the index incorporates internal control defect information to provide a more accurate reflection of internal control effectiveness. According to industry classification guidelines from the China Securities Regulatory Commission (CSRC), a company with an internal control index above the industry average indicates better internal control quality, with higher index scores representing greater effectiveness, and vice versa.

4.2.2. Independent Variables

1. Manager Age (age): The average age of all members of the management team.
2. Manager Gender (fe): The ratio of female managers to the total number of managers.
3. Manager Education Level (edu): Education levels are assigned values as follows: vocational school or below = 1, associate degree = 2, bachelor's degree = 3, master's degree = 4, and doctoral degree = 5. The average education level of all managers in the company is then calculated.
4. Manager Compensation (pay): The natural logarithm of the annual salary of the top three executives.
5. Manager Shareholding Ratio (grate): The ratio of shares held by the largest shareholder to the total shares of the company.

5. Descriptive Statistical Analysis

To provide an intuitive overview of each indicator for the sample companies, descriptive statistical analysis was performed, and the results are presented in Table 2.

Table 2. Descriptive Statistics Results

	N	Minimum	Maximum	Mean	Standard Deviation
IC	200	13.52	90.32	60.39	9.26
age	200	30.52	60.81	49.84	3.96
fe	200	0.00	0.64	0.19	0.11
edu	200	1.89	4.38	3.17	0.43
pay	200	10.33	17.21	14.46	0.74
grate	200	0.05	0.89	0.12	0.02

Analysis of Table 5.1 shows that the average internal control index for the 200 A-share listed companies in Shanghai and Shenzhen is 60.39, indicating that most companies have an internal control quality above the passing threshold. However, the standard deviation of 9.26 reveals significant variation in internal control quality among companies.

The average age of executives across all samples is 49.84, indicating that most managers are middle-aged. The minimum average age is 30.52, and the maximum is 60.81, reflecting considerable age variation across management teams. Some companies have younger management teams, while others have significantly older teams.

The average proportion of female managers is only 0.19, meaning that female managers make up only 19 on average among the 200 sample companies. With a minimum of 0, this indicates that some companies have no female managers at all. The standard deviation of 0.11 suggests that there is limited variation across companies, and management teams are still predominantly male.

The average educational level for management teams is 3.17, indicating that most senior management teams in listed companies have at least a bachelor's degree, with many having a master's degree as well. A standard deviation of 0.43 shows that the average education level of management teams across companies varies between bachelor's and master's degrees.

In terms of executive compensation, measured by the natural logarithm of the top three executives' annual salaries, the maximum value is 17.21, the minimum is 10.33, and the average is 14.46. This reflects the high overall compensation for executives in listed companies, as companies tend to offer attractive compensation to encourage executives to improve corporate governance and performance.

The average managerial shareholding ratio is relatively low at 12, with a maximum of 89 and a minimum of 5. In China, employee shareholding plans were initially underregulated, with a narrow range of eligible participants. It was only after the issuance of the 2014 "Guidelines for the Pilot Implementation of Employee Stock Ownership Plans by Listed Companies" that employee shareholding plans were implemented in a more standardized manner.

6. Correlation Analysis

Table 3 presents the findings from the correlation analysis of the variables. Pearson correlation tests show that for the selected sample:

Manager Age and Internal Control Effectiveness: With a P-value of 0.239, the significance test shows that manager age is positively associated with internal control effectiveness at the 1 significance level, supporting Hypothesis H1.

Manager Gender and Internal Control Effectiveness: The P-value is 0.137, indicating a relatively low correlation that does not meet the significance criteria, thus failing to support Hypothesis H2.

Manager Education Level and Internal Control Effectiveness: The P-value of 0.581 confirms a significant positive correlation at the 1 level, validating Hypothesis H3.

Manager Compensation and Internal Control Effectiveness: With a P-value of 0.378, the relationship between manager compensation and internal control effectiveness is significantly positive at the 1 level, supporting Hypothesis H4.

Manager Shareholding Ratio and Internal Control Effectiveness: A P-value of 0.436 indicates that a higher shareholding ratio among managers is positively associated with internal control effectiveness, validating Hypothesis H5.

Table 3. Correlation Analysis

	IC	age	fe	edu	pay
IC	1				
age	0.239***	1			
fe	0.137	-0.012	1		
edu	0.581***	0.139	0.161	1	
pay	0.378***	0.153	-0.028	0.175	1
grate	0.436***	0.024	0.235	0.026	-0.149

Note: "**" and "***" indicate significance at the 0.05 and 0.01 levels, respectively.

7. Conclusions and Implications

The analysis indicates that both internal and external characteristics of management influence the effectiveness of internal controls in firms. Companies may improve their internal control quality by strategically designing and leveraging certain managerial traits, ultimately aiding risk mitigation and the achievement of corporate goals.

7.1. Optimize Age Structure of Management

Results suggest that older managers contribute positively to internal control quality, though within certain age ranges. This doesn't imply that age alone qualifies a manager; younger managers bring adaptability and openness to innovation, essential in dynamic markets. A balanced age structure that incorporates both younger and older managers can harness both innovation and experience, ensuring steady guidance and risk aversion.

7.2. Prioritize Managerial Skill over Gender in Selection

Internal control effectiveness appears unaffected by manager gender. Thus, companies may focus on management skills rather than gender when promoting or appointing leaders. A management team with a mix of genders can combine the unique strengths each brings, potentially enhancing overall management quality.

7.3. Focus on Developing Highly Educated Managerial Talent

Internal control effectiveness improves with higher education levels among managers. Education often correlates with enhanced decision-making abilities and adaptability to new environments, which supports better internal control practices. When selecting and recruiting managerial talent, companies

may prioritize educational background and invest in educational development as part of talent cultivation.

7.4. Enhance Manager Compensation Incentives

Higher compensation levels among managers correlate with stronger internal controls. This can be understood from two perspectives. First, effective internal control aids risk management, contributing to sustainable growth. Second, managers with higher compensation are likely to align their interests more closely with the firm's goals, enhancing both internal control quality and financial performance. Thus, a sound incentive structure is vital for aligning managerial and corporate objectives.

7.5. Refine Manager Equity Incentive Policies

The positive correlation between manager shareholding and internal control effectiveness suggests that equity incentives align managers' personal goals with those of the company. Managers with a stake in the company are motivated to strengthen internal controls and reduce agency costs, fostering proactive risk management. Companies may consider employee stock ownership plans as a means of maximizing shared interests, reducing costs, and enhancing internal control.

References

[1] Li Duansheng, & Zhou Hong. Characteristics of executive teams, vertical characteristics differences, and internal control quality. Audit and Economic Research, 2017 (2), 24 - 34.

[2] Chi Guohua, & Wang Yu. Board characteristics and internal control deficiency information disclosure: An empirical study from the perspective of institutional change. Finance and Economics Theory and Practice, 2018 (6), 83 - 89.

[3] Zhou Luo, Wu Baoyun, & Sun Daode. Empirical study on the educational structure of enterprise management and internal control quality. Journal of Fuyang Teachers College (Natural Science Edition), 2018 (1), 83 - 90.

[4] Wu Ying. Correlation study on executive characteristics and internal control quality of enterprises—based on data from 24 A-share listed companies. Accounting for Township Enterprises in China, 2019 (4), 209 - 211.

[5] Shi Bin. Empirical analysis of employee stock ownership plans and internal control effectiveness in listed companies—based on empirical data from A-share listed companies in China. Journal of Jiangsu Vocational College of Economics and Trade, 2019 (2), 16 - 21.