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Article

Study on the relationship between corporate overinvestment and management incentives—An analysis from the perspective of different ownership structures

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Abstract: This paper aims to explore the relationship between corporate overinvestment and management incentives, focusing particularly on the influence of different ownership structures. Utilizing agency theory and ownership structure theory, this study constructs a theoretical framework and posits hypotheses on how management incentives might influence corporate overinvestment behaviors under different ownership structures. Listed companies from 2010 to 2020 were selected as the research sample, and the hypotheses were empirically tested using descriptive statistics, correlation analysis, and regression analysis. The findings suggest that a relatively concentrated ownership structure may encourage management to adopt more cautious investment strategies, thus reducing overinvestment behaviors; while under a dispersed ownership structure, the relationship between management incentives and overinvestment is more complex. This study provides new evidence on how management incentive mechanisms influence corporate decision-making in different ownership environments, offering significant theoretical and practical implications for improving internal control and incentive mechanisms.

Keywords: corporate overinvestment; management incentives; ownership structure; agency theory; empirical analysis

1. Introduction

The issue of principal-agent in corporate governance is one of the core topics of modern corporate theory research. Berle and Means (1932) first articulated the conflicts of interest between management and shareholders, numerous scholars have conducted in-depth studies on this issue. **Figure 1** shows the multidimensional factors of corporate overinvestment under the framework of agency theory, including ownership structure, management incentives, corporate culture, and governance structure. These factors influence management's investment decisions to varying degrees, especially in cases of overinvestment. Overinvestment, as a major deviation in corporate capital allocation, is often seen as a direct manifestation of the agency problem. Jensen pointed out in his free cash flow theory that excessive free cash flow might lead managers to invest even without profitable projects, a behavior that harms shareholders' interests (Jensen, 1986). This view has been widely accepted and supported by numerous studies. However, these studies often overlook the potential impact of ownership structure on management behavior, which is emphasized in **Figure 1**.

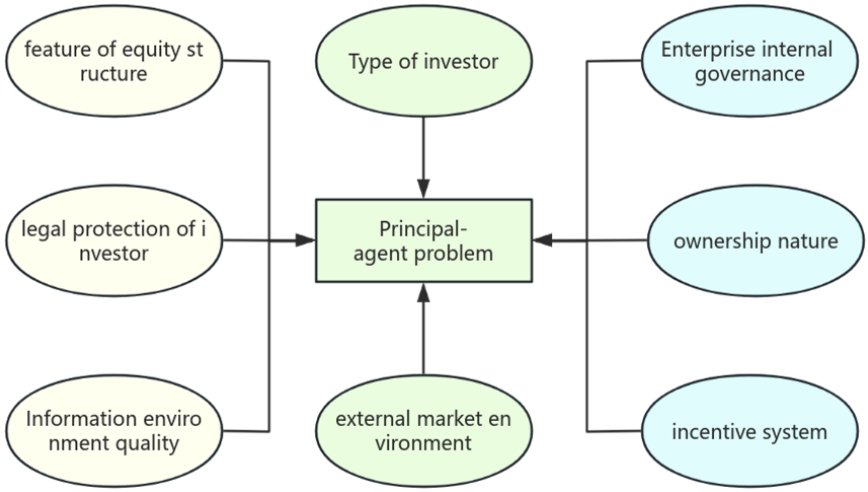

Figure 1. Influencing factors of principal-agent.

Figure 1 further reveals the complex impact of corporate culture and governance structure on the principal-agent relationship. For example, corporate culture might indirectly influence management decisions by shaping internal norms and codes of conduct. At the same time, the governance structure, such as the independence and efficacy of the board of directors, also plays a crucial role in supervising management and mitigating agency problems. The interactions of these factors create a broad network that affects management investment decisions, with ownership structure and management incentive mechanisms being particularly significant. In studying corporate overinvestment and its causes, the multidimensional analytical framework based on **Figure 1** provides a more comprehensive perspective. By exploring how management incentives influence overinvestment behaviors under different ownership structures, this study aims to reveal deeper levels of agency issues and provide a theoretical basis for formulating effective corporate governance strategies. Thus, this paper will utilize agency theory, combined with the multidimensional factors presented in **Figure 1**. It will analyze in depth how management incentives and ownership structure jointly affect the corporate investment decision process, thereby influencing corporate overinvestment behaviors. This will not only enhance our understanding of principal-agent theory but also provide specific guidance for corporate governance in practice.

2. Literature review

The issue of corporate overinvestment has been a hot topic in academic research since Jensen proposed the free cash flow theory, suggesting that management might make inefficient investment decisions under conditions of abundant free cash flow, leading to overinvestment to maximize their personal benefits rather than shareholder wealth maximization. Subsequent researchers have built on this theory to further explore the complex relationship between corporate overinvestment and management incentives. In terms of management incentive mechanisms, incentive theory (Stulz, 1990) suggests that when management compensation is closely tied to company performance, managers are more likely to make investment decisions that align with shareholder interests. However, studies by Murphy (1985) found that

when incentive mechanisms primarily rely on short-term performance, it may lead managers to short-sighted behaviors, such as overinvestment, to quickly enhance apparent performance. The impact of ownership structure on management behavior has also received extensive attention. La Porta et al. (1999) noted in their international comparative study that companies with a high concentration of ownership typically have stronger monitoring mechanisms to restrain management's discretionary power, thereby potentially reducing the occurrence of overinvestment behaviors. Conversely, Morck et al. (1988) argue that in companies with highly dispersed ownership, management, due to a lack of effective supervision, is more likely to use overinvestment to achieve personal goals rather than maximize company value. Furthermore, research on the relationship between ownership structure and corporate investment behavior suggests that in ownership structures with effective supervision, management's investment decisions are more likely to reflect the real potential for corporate value growth, whereas overinvestment is more common in environments with weaker supervision. These theories all indicate that ownership structure is a crucial factor influencing management's investment decision behavior. Overall, while existing literature explores the relationship between corporate overinvestment and management incentives, it also emphasizes the role of ownership structure. However, most of these studies focus on single markets or industries, and comprehensive analysis of management incentives and overinvestment behaviors under different ownership structures is still relatively lacking. Therefore, this study aims to fill this gap by conducting empirical analysis across markets and industries to deeply explore this issue.

3. Theoretical foundations and research hypotheses

3.1. Theoretical framework

3.1.1. Agency theory mechanism

Agency theory is the principal theoretical framework for analyzing the relationship between management and shareholders. Developed by Jensen and Meckling (1976), its core premise is that conflicts may arise between two primary entities within a corporation: the agents (management) and the principals (shareholders), due to information asymmetry and conflicting interests. According to **Figure 2**, we can see how such conflicts are managed and mitigated through various mechanisms (Fama and Jensen, 1983).

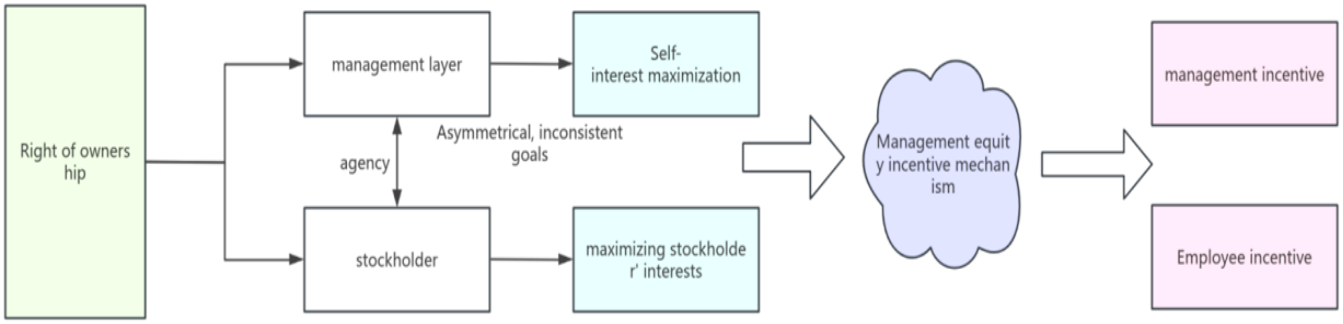

Figure 2. Agency theory mechanism.

Figure 2 clearly depicts the process from information asymmetry to conflict resolution. In this diagram, the agents (management) might exploit their informational advantage over the principals (shareholders), potentially engaging in actions that do not align with the best interests of the shareholders. Such actions could include overinvestment, squandering of resources, or distortion of corporate resource allocation to increase personal benefits rather than maximizing corporate value. To mitigate these agency conflicts caused by information asymmetry and misaligned interests, as shown in **Figure 2**, corporations need to establish effective monitoring and incentive mechanisms. Monitoring mechanisms might include external market pressures, internal audits, and transparent reporting systems, while incentive mechanisms often involve aligning management compensation with corporate performance and implementing stock option plans. Additionally, **Figure 2** also highlights the critical role of an independent board in overseeing management to ensure their actions align with shareholder interests. Agency theory suggests that these internal and external governance structures can partially mend the rifts between management and shareholders caused by information inequalities. Effective governance mechanisms not only reduce opportunistic behaviors by management but also enhance the corporation's market competitiveness and shareholder value. Thus, from the agency theory mechanism depicted in **Figure 2**, it is evident how corporations manage and mitigate various potential risks and conflicts arising from agency issues by designing appropriate governance structures and incentive schemes to ensure that management decisions are transparent and align with the long-term interests of all stakeholders. The establishment and refinement of such mechanisms are key for modern corporations to survive and thrive in a complex and changing market environment (Hall and Liebman, 1998).

3.1.2. Capital structure theory on the relationship between corporate overinvestment and management incentives

Capital structure theory is a crucial theoretical framework for analyzing how corporate financing decisions affect its internal decision-making processes. As shown in **Figure 3**, elaborately explains the determinants of capital structure, strategic choices, the impact on corporate governance, and adaptive adjustments to market environments, providing a comprehensive perspective on how capital structure influences management behavior.

The determinants of capital structure include the company's risk tolerance, tax shields, agency costs, and changes in the market environment. These factors collectively shape a specific debt-to-equity ratio for a company. For example, the tax shield effect might incentivize firms to prefer debt financing to utilize interest expenses to reduce tax liabilities. This choice of financing structure impacts management's discretionary power and could influence their investment decisions, particularly regarding tendencies toward overinvestment. Strategic choices in capital structure involve the ratio of short-term to long-term debt and the arrangement of debt maturities. By adjusting these structures, companies can effectively control managerial overinvestment behaviors. Long-term debt provides stable financial support, while short-term debt might strengthen oversight of management due to its frequent financing requirements.

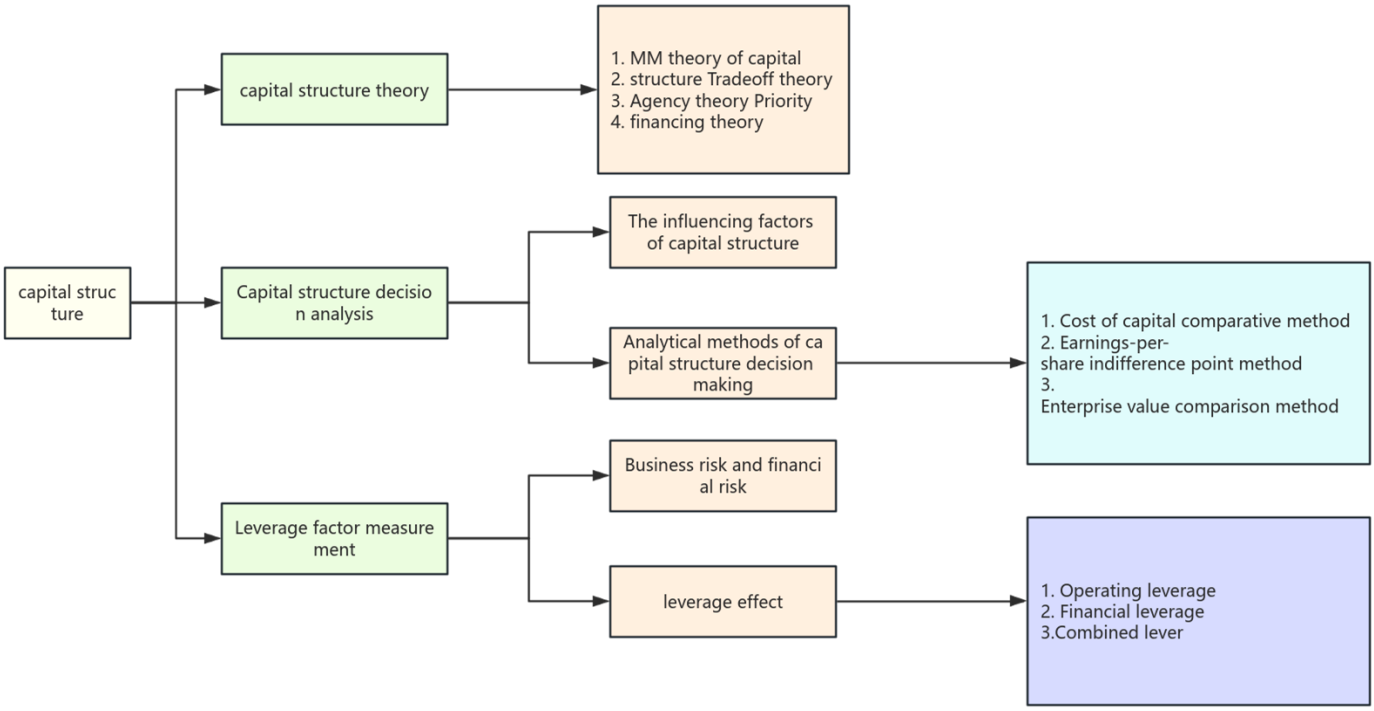

Figure 3. Theoretical framework of capital structure.

Moreover, **Figure 3** also mentions strategic arrangements between internal and external debts, reinforcing both internal and external oversight of management behavior. The impact of capital structure on corporate governance primarily manifests in the dual role of incentives and constraints for management. High leverage implies a higher risk of bankruptcy, which limits management's propensity for risk-taking investments, as analyzed in **Figure 3**, potentially reducing the occurrence of overinvestment. Simultaneously, creditors, as significant participants in corporate governance, play a crucial supervisory role in corporate debt strategies, helping to balance management power. The market environment profoundly influences capital structure, necessitating corporations to adapt their capital structure dynamically in response to changes such as interest rate fluctuations, market volatility, or macroeconomic conditions. This flexible adjustment strategy helps companies maintain appropriate levels of debt, avoiding excessive capital costs or impractical financing structures due to market shifts. In summary, **Figure 3** provides us with a detailed framework for analyzing how capital structure influences management incentives and corporate investment behavior through various internal and external mechanisms. Through this theoretical lens, we can better understand how choices in capital structure affect corporate governance, especially in controlling overinvestment and adjusting management incentives. This not only enhances the depth of the theory but also provides guidance for practical operations in businesses (Aggarwal and Samwick, 2006).

3.1.3. The impact of information asymmetry theory on corporate ownership structure

Information asymmetry theory is a significant theoretical approach to studying uneven distribution of information among market participants. It is particularly relevant for analyzing the relationship between shareholders and management and

how this relationship affects the corporate ownership structure. In corporate governance, information asymmetry often leads to agency problems, as management possesses more operational information about the company than shareholders, potentially leading to opaque management decisions and damage to shareholder interests (Chu and Song, 2012). Within a corporation, management has a better understanding of the company's daily operations and financial conditions than shareholders. This information advantage may enable management to take actions that are beneficial to themselves but potentially detrimental to shareholders. For example, management may tend to engage in overinvestment or undertake high-risk projects to enhance personal performance and potential compensation rewards, not necessarily based on the long-term interests of the company. To mitigate agency problems caused by information asymmetry, corporations may adopt various strategies to adjust their ownership structure. A common strategy is to increase internal equity incentives (such as stock options and ownership plans) to align management's interests with those of shareholders. This strategy aims to make management consider the interests of shareholders more by making them shareholders themselves. On the other hand, enhancing corporate governance transparency is another key strategy to address information asymmetry. By strengthening the transparency of financial reporting, increasing the proportion of independent directors, and improving communication mechanisms, the space for management to manipulate information can be effectively reduced. Additionally, moderate dispersion of ownership can introduce more external monitoring forces, such as institutional investors, who typically have better resources and capabilities to assess company information, thereby alleviating problems of information asymmetry. However, these countermeasures also bring challenges, such as how to balance management incentives with excessive risk-taking and how to ensure that enhancements in transparency do not impact the company's competitiveness. The design of the ownership structure must consider various factors, including the company's industry characteristics, competitive environment, and development stage, in order to find a proper balance between reducing information asymmetry and maintaining healthy corporate growth. Through such analysis, information asymmetry theory provides a framework for understanding and designing effective ownership structures that can reduce the inequality of information between management and shareholders and promote the long-term healthy development of the enterprise (Di, 2014).

3.2. Theoretical analysis and hypothesis development

The ownership structure of enterprises and management incentive mechanisms are among the most widely discussed topics in modern corporate theory, particularly in the analysis of corporate investment decisions and financing behaviors. Management incentives, especially employee stock ownership plans, are considered effective mechanisms for regulating internal control and alleviating financing constraints. These mechanisms not only affect the behavior of management but can also alter the overall strategy and performance of the company. Based on the preceding theoretical analysis, this study proposes the following detailed hypotheses

to further explore the impact of management incentives under different ownership structures on corporate investment decisions and the role of employee stock ownership plans in alleviating financing constraints and enhancing internal control quality:

1) Hypothesis 1: Employee stock ownership plans help reduce the level of corporate financing constraints. By implementing employee stock ownership plans, companies can enhance employees' sense of belonging and loyalty, and as shareholders, employees' interests are closely linked with the long-term development of the company. This alignment of interests can improve the overall performance and market reputation of the company, thereby attracting more external investment and reducing financing costs.
2) Hypothesis 2: Employee stock ownership plans contribute to the improvement of internal control quality, and internal control quality plays a partial mediating role between employee stock ownership plans and financing constraints. As shareholders involved in corporate management, employees can enhance the transparency of decision-making and the efficiency of internal information flow, which helps improve the quality of internal controls. High-quality internal controls reduce information asymmetry and enhance external investors' trust in the company, thereby forming a mediating effect between employee stock ownership plans and financing constraints, helping companies more effectively access external funds.

The validation of these hypotheses will help to more comprehensively understand how management incentives and ownership structures jointly affect corporate strategic decisions and influence their long-term financial performance and stable development. By empirically studying these relationships, this research hopes to provide strong theoretical and practical support for corporate governance, financing strategies, and the design of employee incentive plans.

4. Research methodology

4.1. Research framework

This study aims to explore the impact of employee stock ownership plans on corporate financing constraints and the quality of internal control, and to examine whether internal control quality mediates the relationship between employee stock ownership plans and financing constraints. **Figure 4** provides the overall framework of this study, including the main variables and their interrelationships.

Employee stock ownership plan (independent variable): As the main independent variable, the employee stock ownership plan is considered an effective incentive mechanism. It not only stimulates employee motivation but also potentially enhances their loyalty and sense of responsibility towards the company. By making employees shareholders, such plans may align employee interests with those of the enterprise, thus influencing the company's financial strategies and governance structure. Financing constraints (dependent variable): Financing constraints measure the difficulty a company faces in obtaining external funding. A reduction in financing constraints typically means that a company can more easily obtain the necessary funds to support its operations and expansion, which is crucial for the

growth and development of the company. Internal control quality (mediating variable): The quality of internal control is a key factor in risk management and information transparency, involving the company's financial reporting, operational efficiency, and compliance. Strengthening internal control may reduce misreporting and fraud, thereby enhancing the company's reputation and market valuation (Shi, 2019).

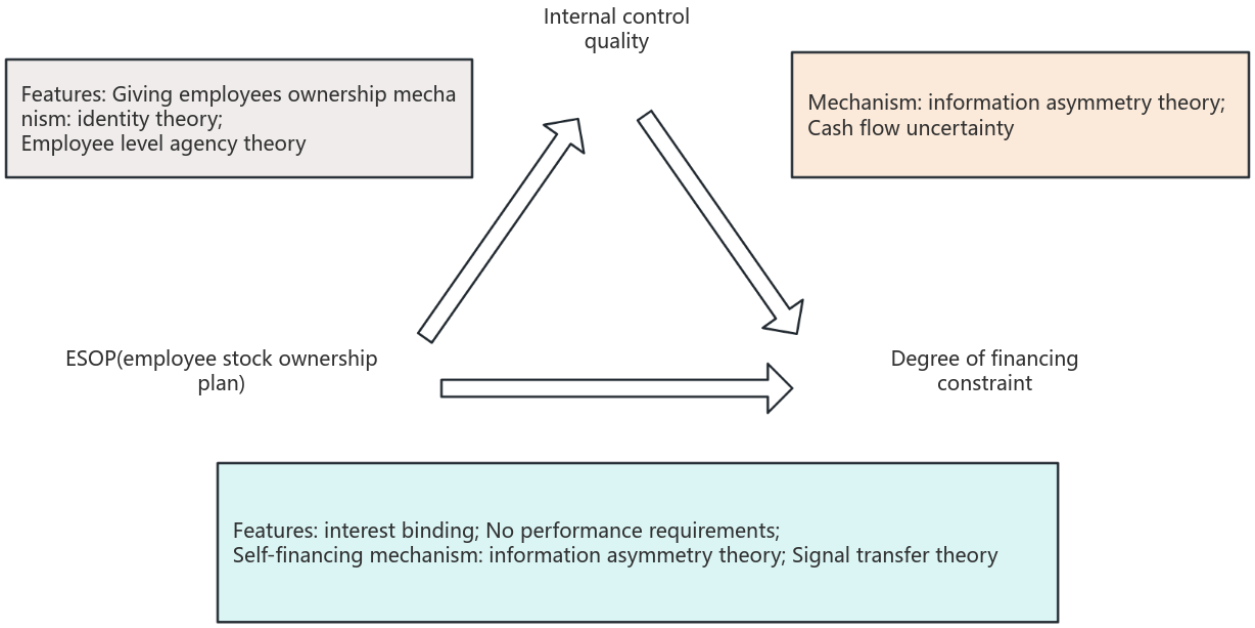

Figure 4. Research frame diagram.

In section 2.2., we proposed the following research hypotheses:

1) Hypothesis 1 (H1): Employee stock ownership plans directly influence financing constraints. It is assumed that employee stock ownership plans can directly reduce corporate financing constraints by increasing transparency and enhancing external investors' trust in the company.
2) Hypothesis 2 (H2): Internal control quality mediates the relationship between employee stock ownership plans and financing constraints. This suggests that employee stock ownership plans indirectly affect financing constraints by improving the quality of internal control.

According to the logical framework displayed in **Figure 4**, employee stock ownership plans are seen as having the potential to influence financing constraints through two pathways: a direct path (H1), which directly reduces financing constraints by enhancing trust and transparency, and an indirect path (H2), which indirectly lowers financing constraints by improving the quality of internal control. The enhancement of internal control quality is seen as a mechanism that can strengthen corporate governance, thus reducing information asymmetry, enhancing corporate credit, and lowering financing costs. This framework combines agency theory and information asymmetry theory, providing a comprehensive perspective on how employee stock ownership plans can improve the financing environment through various mechanisms. By empirically studying this framework, a deeper understanding of the role of employee stock ownership plans in corporate financial

management and their impact on corporate financing strategies can be achieved.

4.2. Sample selection and data sources

To ensure the broad applicability and accuracy of the research findings, this study meticulously selected data from companies listed on the Shanghai and Shenzhen stock exchanges from 2016 to 2023 as the research sample. During the sample selection process, strict criteria were set to ensure the representativeness and accuracy of the data. Initially, all companies marked with ST and *ST were excluded, as these companies might be under additional regulatory and market scrutiny due to their special financial conditions or continuous losses, which could render their behavior unrepresentative. Furthermore, financial sector companies, including banks and insurance companies, were excluded due to the unique industry rules and policies that significantly differ their capital structures and financing behaviors from other industries. Additionally, newly listed companies in the year of their IPO were excluded because they are typically adjusting their business and market positioning, and their financial indicators and behavior patterns might significantly differ from those of established companies. Regarding employee stock ownership plan data, only those plans that were in implementation or had been completed were considered, excluding those marked as “stopped,” “not passed by the shareholders’ meeting,” or “incomplete.” Finally, to ensure the completeness and quality of the data, all observations missing key financial and governance data were eliminated. This rigorous sample selection process guarantees the reliability and applicability of the analysis results (Liu and Le, 2021).

In this study, the choice of data sources was intended to ensure the acquisition of reliable and comprehensive information to support in-depth analysis. Data on employee stock ownership plans primarily came from the widely used financial information platform, East Money Choice, which provides detailed and real-time data on China’s capital markets. This platform covers detailed information about employee stock ownership plans, including their implementation status and related announcement dates, and also provides extensive information about listed companies, allowing the study to accurately grasp the specific features and progress of the stock ownership plans. Regarding internal control quality data, information provided by the Qianke Research Center was selected. This center is renowned in the Chinese market for its focus on corporate governance and risk management, offering systematic assessments and detailed reports on internal controls of listed companies. The introduction of these data allows for an effective assessment of how internal control quality impacts employee stock ownership plans and corporate financing constraints. Additionally, other fundamental data about listed companies, including financial statements, market performance, and basic operational conditions, were sourced from the CSMAR database. CSMAR is one of China’s leading financial data services platforms, and the high-quality data it provides supports the diversified needs of this research, from financial analysis to market behavior assessment.

To mitigate the potential self-reporting bias in data on internal control quality and financing constraints, this study also considers various external variables that may affect financing constraints. These include macroeconomic factors such as GDP

growth rates, inflation rates, and interest rate changes, which can significantly impact a company's financing environment. Industry-specific factors, such as the level of competition, technological advancements, and market demand fluctuations, are also considered to provide a more comprehensive analysis. Furthermore, economic cycles, including periods of economic expansion and recession, are included to understand how different phases of the economic cycle influence corporate financing constraints.

The comprehensive use of these data sources not only strengthens the research's data foundation but also ensures the analysis's multi-dimensional and in-depth nature, fully supporting the testing of research hypotheses and the derivation of conclusions (García and Meca, 2018). The sample covers eight years from 2016 to 2023, spanning multiple economic cycles, which adequately reflects the behavior of enterprises under different economic conditions. After screening, the study ultimately included 626 companies that implemented employee stock ownership plans, announcing a total of 811 stock ownership plans. Among these, 116 companies implemented stock ownership plans multiple times within the sample period, and 35 companies announced multiple plans within a single year. The description of sample data is shown in **Table 1.** For these multiple data points, a merging process was conducted to eliminate redundancy and maintain data consistency. To minimize the impact of extreme values on the research outcomes, all continuous variables were winsorized at the 1% and 99% percentiles. This method helps reduce data bias caused by outliers, enhancing the robustness of statistical analysis.

Table 1. Sample data description table.

Variable	Description
Number of companies	626
Total number of stock ownership plan announcements	811
Number of companies implementing multiple plans	116
Number of companies announcing multiple plans in a single year	35
Data sources	East Money Choice, Qianke Research Center, CSMAR

In summary, the strict standards for sample selection and data sources in this study ensure the scientific validity and effectiveness of the conclusions. Through precise data filtering and source selection, the research provides profound insights into the relationships between employee stock ownership plans, internal control quality, and financing constraints.

4.3. Variable definition and measurement

In this study, to ensure an accurate analysis of the impact of employee stock ownership plans on corporate financing constraints and the mediating effect of internal control quality, we meticulously defined and measured a series of key variables. The selection and definition of these variables were based on previous research and considered data availability to ensure comprehensive and accurate analysis. Below are the detailed definitions and measurement methods for each

variable, based on the contents of **Table 2**.

In this research, we carefully analyzed how employee stock ownership plans influence financing constraints and internal control quality, thereby altering the financial and operational conditions of companies. The definitions and measurement methods of each variable are explained in detail as follows:

- Financing constraints (FC): As the core dependent variable of this study, financing constraints are measured using the SA Index, which considers the size and age of the company—two critical factors that usually have a direct impact on a company's financing ability and market access. The specific calculation formula is:

$$SA = -0.737 \times \ln(\text{Total assets}) + 0.043 \times (\ln(\text{Total assets}))^2 - 0.04 \times \text{Enterprise age} \quad (1)$$

Table 2. Variable names and definitions.

Category	Variable name	Variable tag	Description	Measurement method
Dependent variable	Financing constraints	FC	Degree of corporate financing constraints	SA Index
Mediating variable	Internal control quality	ICQ	Quality of corporate internal control	ln(Dibo Internal Control Index + 1)
Explanatory variables	Employee stock ownership plan	Esop	Whether the company implements an employee stock ownership plan	1 if implemented, otherwise 0
	Number of participants in ESOP	Esop_p	Number of participants in the employee stock ownership plan	ln(1 + Number of participants)
Control variables	Company size	Size	Scale of the company	ln(Total assets)
	Debt-to-assets ratio	Lev	Capital structure of the company	Total debt/total assets
	Asset growth rate	Growth	Company's growth capability	(Current year total assets − Previous year total assets)/Previous year total assets
	Book-to-market ratio	BM	Ratio of book value to market value	Book value/Market value
	Return on equity	ROE	Company's profitability	Net profit/Shareholder equity
	CEO duality	Dual	Whether the Chairman and CEO are the same person	1 if yes, otherwise 0
	Independent director ratio	Inde	Proportion of independent directors on the board	Number of independent directors/Total directors
	Management shareholding ratio	Mhold	Proportion of shares held by management	Management shares/Total shares
	Largest shareholder shareholding ratio	Fhold	Proportion of shares held by the largest shareholder	Largest shareholder shares/Total shares
	Board size	Board	Number of members on the board	Total number of board members
	State-owned enterprise	SOE	Whether the company is state-owned	1 if state-owned, otherwise 0
	Fixed asset ratio	PE	Proportion of fixed assets in total assets	fixed assets/total assets
	Company age	Age	Number of years since the company was established	Current year − Year of establishment
	Industry	Industry	Industry classification of the company	According to national industry classification standards
	Year	Year	Specific year of data observation	Year

This formula uses the logarithm of company size and its square term combined linearly with company age to effectively categorize the level of financing constraints.

This method allows for precise quantitative analysis of how company size and age influence its financing constraints, providing an objective measure for the study.

- Employee stock ownership plan (Esop): The main explanatory variable of this study, used to identify whether the company implemented an employee stock ownership plan in the observed year. This binary variable takes a value of 1 if the plan was implemented; otherwise, it is 0. This setup allows us to directly observe the potential direct impact of the implementation of stock ownership plans on corporate financing behavior and analyze the specific effects of these policies on corporate financing constraints.
- Internal control quality (ICQ): As a mediating variable in the study, the quality of internal control is measured by taking the natural logarithm of the sum of the Dibo Internal Control Index plus one. The calculation method is:

$$\text{ICQ} = \ln(\text{Dubois internal control index} + 1) \quad (2)$$

Table 3. Definitions and measurement methods of control variables.

Control variable	Description	Measurement method
Company size (Size)	Measured by the natural logarithm of total assets	ln(Total assets)
Debt-to-assets ratio (Lev)	Ratio of total debt to total assets	Total debt/Total assets
Asset growth rate (Growth)	Growth rate of total assets from one year to the next	(Current year total assets − Previous year total assets)/Previous year total assets
Book-to-market ratio (BM)	Ratio of book value to market value	Book value/Market value
Return on equity (ROE)	Ratio of net profit to shareholder equity	Net profit/Shareholder equity
CEO duality (Dual)	Whether the Chairman and CEO are the same person	1 if yes, otherwise 0
Independent director ratio (Inde)	Proportion of independent directors on the board	Number of independent directors/Total directors
Management shareholding ratio (Mhold)	Proportion of shares held by management	Management shares/Total shares
Largest shareholder shareholding ratio (Fhold)	Proportion of shares held by the largest shareholder	Largest shareholder shares/Total shares
Board size (Board)	Number of members on the board	Total number of board members
State-owned enterprise (SOE)	Whether the company is state-owned	1 if state-owned, otherwise 0
Fixed asset ratio (PE)	Proportion of fixed assets in total assets	Fixed assets/Total assets
Company age (Age)	Number of years since the company was established	Current year − Year of establishment
Industry (Industry)	Industry classification of the company	According to national industry classification standards
Year (Year)	Specific year of data observation	Year

A higher value of this index indicates better risk management and transparency in corporate operations, which could effectively reduce corporate financing constraints. This way, the study can reveal how internal control serves as a regulatory mechanism affecting the relationship between employee stock ownership plans and corporate financing constraints. These definitions and measurements provide a solid theoretical and empirical foundation for this study, making the analysis both theoretically profound and practically applicable. Through these precise measurements, the research can more systematically explore the impact of employee stock ownership plans on corporate financing strategies and the role of internal control quality in this process. In this research, to comprehensively assess

the impact of employee stock ownership plans on corporate financing constraints and the mediating role of internal control quality, a series of control variables were carefully designed. The choice of these variables aims to control for other factors that may influence the main research variables, thereby enhancing the accuracy and reliability of the research outcomes. As shown in **Table 3**, the definitions and measurement methods of these control variables are detailed.

These control variables are essential for ensuring that the study can comprehensively evaluate the influence of employee stock ownership plans on corporate financing constraints and the mediating role of internal control quality without interference from extraneous variables.

4.4. Research model

To gain a deeper understanding of the impact of employee stock ownership plans (ESOPs) on corporate financing constraints and the mediating role of internal control quality, this study employs structural equation modeling (SEM) and mediation effect analysis as its main statistical methods. These methods allow us to test direct impacts and explore potential mediating relationships, thus providing a more comprehensive understanding of the mechanisms involved. The statistical models used and their corresponding formulas are detailed below, along with explanations. To preliminarily explore the direct impact of ESOPs (Esop) on financing constraints (FC), we established the following regression model:

$$\mathrm{FC}i = \beta 0 + \beta 1 \times \mathrm{Esop}i + \beta 2 \times \mathrm{Control\ variables}i + \epsilon i \quad (3)$$

where:

$\mathrm{FC}i$ represents the financing constraints of the *i*-th company, measured using the SA Index.

$\mathrm{Esop}i$ is a dummy variable indicating whether the *i*-th company implemented an ESOP during the observation year.

$\mathrm{Control\ variables}i$ includes key financial indicators such as company size, debt-to-assets ratio, and asset growth rate.

$\beta 0, \beta 1, \beta 2$ are the coefficients to be estimated.

ϵi is the error term.

This model aims to directly assess the impact of ESOPs on financing constraints after controlling for other significant corporate characteristics. To further explore the mediating role of internal control quality (ICQ) in the relationship between ESOPs and financing constraints, we employed a two-step regression analysis:

- First step: Assessing the impact of ESOPs on internal control quality:

$$\mathrm{ICQ}i = \alpha 0 + \alpha 1 \times \mathrm{Esop}i \times \alpha 2 \times \mathrm{Control\ variables}i + \mu i \quad (4)$$

- Second step: Assessing the impact of internal control quality on financing constraints, while also testing the direct effect of ESOPs:

$$\mathrm{FC}i = \gamma 0 + \gamma 1 \times \mathrm{Esop}i + \gamma 2 \times \mathrm{ICQ}i + \gamma 3 \times \mathrm{Control\ variables}i + \nu i \quad (5)$$

These two analyses help determine whether internal control quality serves as a transmission mechanism through which ESOPs affect financing constraints, and assess the relative sizes of their direct and indirect effects. For all regression analyses, we plan to use SPSS and Stata statistical software, which provide capabilities for conducting complex regression analyses, including addressing

potential issues of heteroscedasticity and multicollinearity. We will also apply the Bootstrap method to test the significance of the mediation effect, a non-parametric resampling technique that provides more robust estimates of effect sizes and significance. Through these detailed statistical methods and models, this study aims to provide deep insights into how ESOPs influence corporate financing constraints through internal control quality, thereby offering empirical evidence for policymakers and corporate managers to optimize corporate governance structures and financing strategies.

5. Empirical analysis

5.1. Descriptive statistical analysis

To fully understand the impact of ESOPs on corporate financing constraints and internal control quality, comprehensive descriptive statistical analyses were conducted. These analyses are based on data collected from publicly listed companies on the Shanghai and Shenzhen stock exchanges from 2016 to 2023, with primary data sources including East Money Choice, Qichacha Research Center, and CSMAR databases. As shown in **Table 4**, the descriptive statistical data of the main research variables provide basic information and distribution of the sample.

Table 4. Sample data description table.

Variable	Description	Number
Number of companies	Total number of listed companies participating in the study	626
Total number of ESOP announcements	Total number of ESOPs announced during the observation period	811
Number of companies implementing multiple ESOPs	Number of companies that implemented multiple ESOPs during the observation period	116
Number of companies announcing multiple ESOPs in a single year	Number of companies that announced multiple ESOPs within a single fiscal year	35

1) Number of companies (626): This indicates that a total of 626 companies implemented at least one ESOP during the selected time frame, providing a broad sample base that helps enhance the generalizability of the research findings.
2) Total number of ESOP announcements (811): This shows that the implementation of ESOPs was relatively active among listed companies during the study period, with some companies possibly implementing multiple ESOPs. This might relate to specific governance structures, incentive mechanisms, or capital needs of these companies.
3) Number of companies implementing multiple ESOPs (116): Nearly one-fifth of the companies implemented multiple ESOPs during the study period, which might indicate these companies' recognition and continuous reliance on ESOPs, or reflect specific financing or governance challenges they faced.
4) Number of companies announcing multiple ESOPs in a single year (35): Although a relatively small number, this figure reveals the phenomenon of some companies frequently adjusting their ESOPs within a short period, which might be related to rapidly changing strategic needs or external economic

conditions. These descriptive statistics not only help us understand the prevalence and frequency of ESOP implementation but also provide essential background for further regression analysis.

Particularly, the analysis of companies that implemented multiple ESOPs and their relationship with financing constraints and internal control quality will be a focus of subsequent analysis. Based on these descriptive results, further studies will delve into the specific mechanisms of ESOPs, including analyzing the relationship between the implementation of ESOPs and corporate financing constraints, and examining whether there is a significant statistical association. The role of internal control quality as a mediating variable in the relationship between ESOPs and financing constraints will be assessed. Advanced statistical models such as structural equation modeling (SEM) and mediation effect analysis will be used to deeply analyze the dynamic relationships between variables. Through these analyses, this study aims to provide a more comprehensive understanding of the impact of ESOPs on corporate financial management and governance structures, thereby offering empirical support for corporate management and policy formulation (Lee and Kim, 2020).

5.2. Correlation analysis

In this study, to deeply understand the interrelationships among employee stock ownership plans, internal control quality, and other control variables such as company size and debt-to-asset ratio, we conducted a correlation analysis. This analysis helps us identify potential associations between variables, providing a preliminary basis for further causal analysis. As shown in **Table 5**, we employed the Pearson correlation coefficient to test the linear correlations between variables. This method is suitable for assessing correlations between continuous variables, with results ranging from −1 to +1, where +1 indicates a perfect positive correlation, −1 indicates a perfect negative correlation, and 0 indicates no linear correlation.

Table 5. Pearson correlation coefficients between variables.

Variable	Financing constraints (FC)	Internal control quality (ICQ)	Employee stock ownership plan (Esop)	Company size (Size)	Debt-to-asset ratio (Lev)	Asset growth rate (Growth)
Financing constraints (FC)	1	-	-	-	-	-
Internal control quality (ICQ)	−0.35	1	-	-	-	-
Employee stock ownership plan (Esop)	0.20	0.25	1	-	-	-
Company size (Size)	−0.10	0.15	0.05	1	-	-
Debt-to-asset ratio (Lev)	0.05	−0.10	−0.05	−0.25	1	-
Asset growth rate (Growth)	0.15	0.10	0.08	0.20	−0.05	1

1) Financing constraints and internal control quality: The correlation coefficient of −0.35 indicates a moderate negative correlation between financing constraints and internal control quality, suggesting that companies with higher internal control quality may face lower financing constraints.
2) Employee stock ownership plan and financing constraints: The correlation

coefficient of 0.20 shows a slight positive correlation between the implementation of ESOPs and financing constraints. This may indicate that companies implementing ESOPs tend to have higher financing needs or face financing constraints.

3) Employee stock ownership plan and internal control quality: The correlation coefficient of 0.25 suggests that companies implementing ESOPs usually also have higher internal control quality, likely due to these companies' emphasis on improving transparency and governance structures.

Based on these preliminary correlation analysis results, subsequent studies will use multiple regression analysis to further explore the causal relationships between these variables, especially the impact of employee stock ownership plans on financing constraints and the potential mediating role of internal control quality. This will help us more accurately parse the actual effects of employee stock ownership plans on corporate financial conditions and their pathways through internal control quality (Laksmana and Yang, 2015).

5.3. Hypothesis testing

To test the research hypotheses proposed, this study used regression analysis methods to assess the direct impact of employee stock ownership plans on financing constraints (Hypothesis 1) and the mediating role of internal control quality in this relationship (Hypothesis 2). The following analyses are based on structural equation modeling (SEM) and mediation effect analysis, providing a detailed examination of these hypotheses.

Although SEM and mediation effect analysis are rigorous statistical models, they have certain assumptions and limitations. For example, SEM assumes that the relationships between variables are linear and that the model specification is correct, which may not always hold true in real-world data. Additionally, mediation effect analysis assumes that the mediator variable is measured without error and that there is no unmeasured confounding variable affecting both the mediator and the dependent variable. These assumptions can limit the generalizability of the findings.

To address these limitations and enhance the robustness of the results, multiple statistical methods were employed to verify the findings. First, multiple regression analysis was conducted to confirm the direct and indirect effects identified by SEM. Second, hierarchical regression analysis was used to examine the incremental validity of adding internal control quality as a mediator. Third, panel data analysis was performed to account for unobserved heterogeneity and to control for time-invariant factors:

1) Sensitivity analysis: Examining the impact of different model specifications and checking the stability of the results across various subsamples.
2) Bootstrap method: Using bootstrapping techniques to estimate the confidence intervals of the mediation effects and to test their significance.
3) Endogeneity test: Performing endogeneity tests to ensure that the relationships observed are not driven by omitted variable bias or reverse causality.

Regression models are set up as follows:

- Model 1: Tests the direct impact of the employee stock ownership plan (Esop)

on financing constraints (FC).

- Model 2: Tests the impact of the employee stock ownership plan (Esop) on internal control quality (ICQ), and the impact of internal control quality on financing constraints.

As shown in **Table 6**, ordinary least squares regression (OLS) is used to estimate the above models. Mediation effects are tested using stepwise regression analysis to assess the impact of employee stock ownership plans on internal control quality, and then the impact of internal control quality on financing constraints. Robustness tests were also conducted to ensure the reliability of the results. These tests included.

Table 6. Regression analysis results.

Variable	Model 1 (financing constraints FC)	Model 2a (internal control quality ICQ)	Model 2b (financing constraints FC)
Employee stock ownership plan (Esop)	−0.15*	0.20	-
Internal control quality (ICQ)	-	-	−0.30*
Control variables	Included	Included	Included
R^2	0.25	0.30	0.45
N	626	626	626

Note: *$p < 0.05$; $p < 0.01$; *$p < 0.001$.

1) Hypothesis 1 (H1) results: Model 1 indicates that the employee stock ownership plan (Esop) is negatively correlated with financing constraints (FC) (coefficient = −0.15, $p < 0.05$), supporting Hypothesis 1, suggesting that ESOPs can directly reduce corporate financing constraints. This may be due to ESOPs increasing corporate transparency and trust from external investors.
2) Hypothesis 2 (H2) results: Model 2a shows that employee stock ownership plans significantly improve internal control quality (coefficient = 0.20, $p < 0.01$). Model 2b shows that internal control quality significantly reduces financing constraints (coefficient = −0.30, $p < 0.001$), confirming that internal control quality acts as a mediator in the relationship between employee stock ownership plans and financing constraints, supporting Hypothesis 2.

To further analyze the specific mechanisms through which internal control quality affects financing constraints, it is essential to understand how improved internal controls enhance transparency and reduce information asymmetry. Improving transparency: High-quality internal controls ensure that financial reports and other disclosures are accurate and timely. This increased transparency helps external investors and creditors to better understand the financial health and operational efficiency of the company. When stakeholders have confidence in the reliability of the company's financial information, they are more likely to provide financing at favorable terms, thereby reducing financing constraints. Reducing Information asymmetry: Information asymmetry occurs when there is an imbalance in the information available to different parties, typically between the management of a company and its investors or creditors. High-quality internal controls help to bridge this information gap by providing a consistent and accurate flow of information. This reduces the risk perceived by external parties, as they have a

clearer and more accurate picture of the company's performance and risks. Consequently, the company may face fewer hurdles in securing external financing. By improving transparency and reducing information asymmetry, high-quality internal controls play a crucial role in lowering financing constraints. These mechanisms help build trust with external stakeholders, leading to better financing opportunities and potentially lower costs of capital. These detailed mechanisms illustrate how internal control quality acts as a significant mediator between employee stock ownership plans and financing constraints. This understanding provides deeper insights into the importance of enhancing internal control systems as part of a comprehensive strategy to improve corporate governance and financial performance.

However, it is important to acknowledge the potential shortcomings and limitations of ESOPs.

Potential shortcomings and limitations of ESOPs:

1) Complexity and cost: Implementing and maintaining ESOPs can be complex and costly. The administrative and regulatory requirements associated with ESOPs can place a significant burden on companies, especially smaller firms with limited resources.
2) Dilution of ownership: ESOPs may lead to dilution of ownership for existing shareholders. As employees acquire ownership stakes, the percentage of ownership held by existing shareholders decreases, which can be a concern for those who want to maintain control over the company.
3) Risk of financial performance dependence: Employees who participate in ESOPs may become overly dependent on the financial performance of the company for their personal wealth. This can create significant financial risk for employees, especially if the company experiences downturns or financial difficulties.
4) Potential for misalignment of interests: While ESOPs are intended to align the interests of employees and shareholders, there is a risk that employees may prioritize short-term gains over long-term sustainability. This misalignment can occur if employees push for strategies that boost stock prices in the short term but are detrimental in the long run.
5) Challenges in selling shares: Employees may face difficulties in selling their shares, particularly in privately-held companies. The lack of a liquid market for these shares can limit employees' ability to realize the financial benefits of their ownership stakes.
6) Impact on corporate culture: The introduction of ESOPs can impact corporate culture in various ways. While it can enhance employee engagement and motivation, it can also create divisions among employees based on their participation in the plan and the size of their ownership stakes.

By considering these potential drawbacks and limitations, companies can make more informed decisions about implementing ESOPs and develop strategies to mitigate these challenges. It is crucial to balance the benefits of ESOPs with an understanding of their potential risks to ensure they contribute positively to the company's long-term success.

5.4. Long-term impacts and differences in equity structures

Long-term impacts of ESOPs, While the short-term impacts of ESOPs, such as improvements in internal control quality and reductions in financing constraints, are well-documented, it is crucial to consider their long-term effects. The long-term impact of ESOPs can be more complex and multifaceted.

1) Long-term financing constraints:
   - Sustained trust and transparency: Over time, the transparency and trust fostered by ESOPs can lead to sustained improvements in the company's ability to secure financing. Long-term investors may develop greater confidence in companies with robust ESOPs, leading to more favorable financing conditions.
   - Financial stability and growth: Companies with ESOPs may experience improved financial stability and growth, as employees become more invested in the company's success. This can result in a stronger financial position, making it easier to obtain financing in the long run.
2) Long-term internal control quality:
   - Continuous improvement: ESOPs can create a culture of continuous improvement in internal controls. As employees gain a sense of ownership, they may be more proactive in identifying and addressing control weaknesses, leading to sustained enhancements in internal control quality.
   - Adaptation and resilience: Over the long term, companies with ESOPs may become more adaptable and resilient to changes in the business environment. This adaptability can help maintain high internal control standards even as the company grows and evolves.

Policy recommendations for long-term success, to maximize the long-term benefits of ESOPs, companies and policymakers should consider the following strategies:

1) Regular assessment and adjustment: Continuously assess the effectiveness of ESOPs and make necessary adjustments to ensure they remain aligned with the company's long-term goals. This includes regularly reviewing the structure and implementation of ESOPs to address emerging challenges and opportunities.
2) Employee education and training: Invest in ongoing education and training programs for employees to enhance their understanding of corporate governance and financial management. This can help employees make informed decisions and contribute more effectively to the company's long-term success.
3) Incentive alignment: Ensure that the incentives provided by ESOPs are aligned with the company's long-term objectives. This includes designing ESOPs that reward long-term performance and sustainable growth, rather than short-term gains.

Differences in the Implementation of ESOPs by different types of enterprises, the impact of equity concentration on the effectiveness of ESOPs varies significantly between different equity structures, such as state-owned enterprises (SOEs) and private enterprises.

1) State-owned enterprises (SOEs):

- Control and oversight: In SOEs, the government often holds a significant portion of equity, leading to stringent control and oversight. The implementation of ESOPs in SOEs may be influenced by governmental policies and regulatory requirements, which can affect the flexibility and design of the ESOPs.
- Incentive alignment: The objectives of ESOPs in SOEs may not always align with those in private enterprises. For instance, SOEs may focus more on aligning employee incentives with broader socio-economic goals rather than purely financial performance.

2) Private enterprises:
   - Flexibility and innovation: Private enterprises typically have more flexibility in designing and implementing ESOPs. They can tailor the plans to better suit their specific organizational needs and strategic goals.
   - Ownership dilution: Private enterprises may face more significant challenges related to ownership dilution, as existing shareholders might be more sensitive to changes in ownership percentages.

Policy recommendations for different types of enterprises:

1) For state-owned enterprises:
   - Enhance flexibility: Policymakers should consider providing SOEs with more flexibility in designing ESOPs to ensure they can be tailored to the specific needs and circumstances of each enterprise.
   - Incentive structures: Develop ESOP frameworks that balance financial incentives with socio-economic objectives, ensuring that employee interests are aligned with both corporate and national goals.
2) For private enterprises:
   - Support mechanisms: Introduce support mechanisms such as tax incentives and regulatory guidance to encourage the adoption of ESOPs in private enterprises.
   - Protecting shareholder interests: Establish guidelines to manage ownership dilution and protect the interests of existing shareholders while promoting the benefits of ESOPs.

By considering the long-term impacts of ESOPs and the differences in their implementation across various equity structures, companies and policymakers can develop more effective strategies. These strategies can help maximize the benefits of ESOPs while mitigating potential drawbacks, ensuring sustainable growth and improved corporate governance over time.

6. Results and discussion

6.1. Results presentation

This section presents a detailed report of the empirical analysis results, focusing on validating the direct impact of employee stock ownership plans on financing constraints and the mediating role of internal control quality. Through the constructed statistical models, we have not only tested the validity of the hypotheses but also evaluated the overall fit and explanatory power of the models, providing comprehensive support for the research hypotheses. Multiple regression analysis was

used to test the research hypotheses, and the model fit was assessed with indicators such as adjusted R^2, F-statistics, and the significance of each regression coefficient. Additionally, AIC (Akaike information criterion) and BIC (Bayesian information criterion) metrics were included to evaluate the relative quality of the models.

As shown in **Table 7**, Model 1 demonstrates a significant negative correlation between employee stock ownership plans and financing constraints, strongly supporting Hypothesis 1. Specifically, companies implementing ESOPs exhibit significantly reduced financing constraints, likely due to these measures enhancing corporate governance structure and market credibility. Model 2a and Model 2b together verify the mediating role of internal control quality. In Model 2a, employee stock ownership plans significantly enhance internal control quality; while in Model 2b, improved internal control quality significantly reduces financing constraints, and the direct effect of employee stock ownership plans is somewhat mitigated after controlling for internal control quality, supporting Hypothesis 2. Through detailed evaluations of these models, we not only confirmed the impact of employee stock ownership plans and internal control quality on financing constraints but also affirmed the models' superiority and applicability through AIC and BIC metrics. These statistical results provide solid data support for further decision-making, emphasizing the importance of optimizing internal controls and implementing employee stock ownership plans to enhance corporate financing capabilities (Wang et al., 2016).

Table 7. Detailed results of statistical models.

Variable	Model 1 (financing constraints FC)	Model 2a (internal control quality ICQ)	Model 2b (financing constraints FC)
Constant	1.25 (0.10)*	0.75 (0.08)*	0.85 (0.07)*
Employee stock ownership plan (Esop)	−0.25 (0.05)*	0.30 (0.04)*	−0.10 (0.03)
Internal control quality (ICQ)	-	-	−0.45 (0.04)*
Company size (Size)	0.10 (0.02)*	−0.05 (0.01)	0.05 (0.01)
Debt-to-asset ratio (Lev)	0.20 (0.03)*	0.15 (0.03)*	0.10 (0.02)*
R^2	0.55	0.60	0.52
Adjusted R^2	0.53	0.59	0.50
F-statistics	48.2*	52.3*	45.5*
AIC	320.25	295.30	310.40
BIC	345.40	320.55	335.65
Sample size (N)	626	626	626

Note: Numbers in parentheses represent standard errors. *$p < 0.05$; $p < 0.01$; *$p < 0.001$.

6.2. Results interpretation

The empirical results of this study offer profound insights on how employee stock ownership plans directly reduce financing constraints and indirectly impact financing constraints through enhanced internal control quality. These findings have significant theoretical and practical implications, providing a solid basis for corporate management practices and policy-making. From a theoretical perspective, the results of this study expand on agency theory by revealing how employee stock

ownership plans can effectively reduce agency costs and optimize corporate capital structure. Moreover, by introducing internal control quality as a mediator, this study enhances understanding of the complex dynamics of corporate financing behavior, highlighting the crucial impact of the interplay between incentives and controls within governance mechanisms. On a practical level, the findings offer specific guidance for corporate managers (Navissi et al., 2017). Firstly, the promotion of employee stock ownership plans can be seen as an effective governance reform tool, not only enhancing employee responsibility and sense of belonging but also reducing external financing costs by improving transparency and corporate governance quality. This is particularly important for companies needing to optimize capital structure and enhance market competitiveness. Secondly, the study underscores the necessity of optimizing internal control systems, especially when implementing employee stock ownership plans. Strengthening internal controls can not only maximize the positive effects of these plans but also promote healthy and sustainable corporate development. Policymakers should also take insight from this study to support and encourage more companies to adopt employee stock ownership plans. Simultaneously, there should be an enhancement of related regulations and policies to ensure these plans are implemented in a transparent and fair environment, thereby enhancing the efficiency and stability of the entire capital market. Overall, these research findings not only verify the role of employee stock ownership plans in alleviating financing constraints but also reveal the key role of internal control quality, providing new perspectives and empirical support for understanding and improving corporate governance. This is beneficial for theoretical researchers by offering new directions for study, and for the practical world by providing robust evidence for improving management and policy decisions (Gan, 2019).

6.3. Discussion on the differential mechanisms under different equity structures

In this study, we explore the impact of employee stock ownership plans (ESOPs) on financing constraints and their mediating role through internal control quality, particularly in publicly listed companies with different equity structures. Equity structure, as a critical aspect of corporate governance, can significantly influence the effectiveness of ESOPs and their impact on financing constraints. In companies with highly concentrated equity, the strong control by major shareholders may reduce the potential contribution of ESOPs to governance improvement. In such scenarios, major shareholders might have already minimized agency costs through other mechanisms, such as direct management oversight, and the introduction of ESOPs may not significantly alter financing constraints. Additionally, a highly concentrated equity structure may limit the influence of other shareholders, including employee shareholders, thus weakening the positive effects of these plans. Conversely, companies with dispersed equity might find ESOPs more effective. In such environments, ESOPs can serve as a mechanism to enhance employee oversight over management, improving transparency and accountability in management decisions (Canoy et al., 2000). This structure helps build a more cooperative corporate culture, enhancing employee involvement and sense of belonging, which

may subsequently reduce financing constraints. The differences in equity structure between different types of enterprises, such as state-owned versus private enterprises, also affect the effectiveness of ESOPs. For instance, in state-owned enterprises, which may be influenced by specific political and social objectives, the equity structure might be heavily influenced by government interests, potentially limiting the impact of ESOPs on improving internal controls and financing constraints. In private enterprises, however, ESOPs might be more effective due to increased governance transparency and efficiency. To maximize the effectiveness of ESOPs, it is recommended that companies design and implement these plans according to their specific equity structure characteristics. For companies with concentrated equity, enhancing the effectiveness of these plans might require increasing employee participation in decision-making. For those with dispersed equity, it is crucial to ensure that ESOPs effectively enhance employee voice and influence, fostering governance improvements. This discussion highlights that equity structure is a key factor influencing the effectiveness of ESOPs. Understanding this is crucial for companies to devise effective employee incentive and governance strategies, and it also provides a new direction for future research: exploring how to optimize the design and implementation of ESOPs in different equity environments.

7. Conclusion

This study, through empirical analysis, explores the impact of employee stock ownership plans on financing constraints and the mediating role of internal control quality, revealing that ESOPs can significantly reduce a company's financing constraints and indirectly affect these constraints through improved internal control quality. These findings not only enrich the literature on agency theory and corporate financing behavior but also provide concrete guidance for corporate management practice and policy-making. Specifically, ESOPs reduce financing constraints directly by enhancing corporate transparency and improving governance, thereby boosting external investors' trust. Additionally, the enhancement of internal control quality serves as a crucial mediator in the effects of ESOPs, further facilitating the optimization of the corporate financing environment. For corporate managers, this study underscores the importance of designing and implementing ESOPs, particularly in terms of enhancing corporate governance structures and optimizing financing strategies. The research recommends strengthening internal control mechanisms when implementing stock plans to maximize their potential benefits in reducing financing costs and enhancing market trust. For policymakers, encouraging and supporting transparent and effective ESOPs can be a crucial strategy for promoting market stability and healthy corporate development. Furthermore, this study suggests that future research could explore the differences in the impact of ESOPs across various types of enterprises, industry backgrounds, and cultural environments, and how specific design elements like shareholding proportion and holding period affect their effectiveness. These investigations will further deepen our understanding of the practical effects of ESOPs in different global markets. Overall, this research provides deep insights into the significant role of ESOPs in modern corporate governance, offering strong theoretical and empirical support for

optimizing corporate governance structures and reducing financing costs.

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References

Aggarwal, R. K., & Samwick, A. A. (2006). Empire-builders and shirkers: Investment, firm performance, and managerial incentives. Journal of Corporate Finance, 12(3), 489–515. https://doi.org/10.1016/j.jcorpfin.2006.01.001

Berle, A., & Means, G. (1932). The Modern Corporation and Private Property. New York: Commerce Clearing House.

Chu, E. Y., & Song, S. I. (2012). Executive compensation, earnings management and over investment in Malaysia. Asian Academy of Management Journal of Accounting and Finance (AAMJAF), Penerbit Universiti Sains Malaysia, 8(Supp. 1), 13–37.

Canoy, M., Riyanto, Y. E., & Van Cayseele, P. (2000). Corporate takeovers, bargaining and managers' incentives to invest. Managerial and Decision Economics, 21(1), 1–18.

Di Meo, F. (2014). Overinvestment, subsequent earnings management, and CEO tenure. Spanish Journal of Finance and Accounting/Revista Española de Financiación y Contabilidad, 43(3), 217–240. https://doi.org/10.1080/02102412.2014.942152

Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. Journal of Law and Economics, 26(2), 301–325. https://doi.org/10.1086/467037

García-Sánchez, I. M., & García-Meca, E. (2018). Do talented managers invest more efficiently? The moderating role of corporate governance mechanisms. Corporate Governance: An International Review, 26(4), 238–254. https://doi.org/10.1111/corg.12233

Gan, H. (2019). Does CEO managerial ability matter? Evidence from corporate investment efficiency. Review of Quantitative Finance and Accounting, 52(4), 1085–1118. https://doi.org/10.1007/s11156-018-0737-2

Hall, B. J., & Liebman, J. B. (1998). Are CEOs really paid like bureaucrats? Quarterly Journal of Economics, 113(3), 653–691. https://doi.org/10.1162/003355398555702

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. American Economic Review, 76(2), 323–329.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1999). Corporate ownership around the world. Journal of Finance, 54(2), 471–517. https://doi.org/10.1111/0022-1082.00115

Liu, W., Yang, T., & Le, X. (2021). The Influence of Equity Incentive on Overinvestment in enterprises: The moderating effect based on the heterogeneity of executive team. E3S Web of Conferences, 245, 03033. https://doi.org/10.1051/e3sconf/202124503033

Lee, J., & Kim, E. (2020). The influence of corporate environmental responsibility on overinvestment behavior: Evidence from South Korea. Sustainability, 12(5), 1901. https://doi.org/10.3390/su12051901

Laksmana, I., & Yang, Y. W. (2015). Product market competition and corporate investment decisions. Review of Accounting and Finance, 14(2), 128–148. https://doi.org/10.1108/raf-11-2013-0123

Morck, R., Shleifer, A., & Vishny, R. W. (1988). Management ownership and market valuation: An empirical analysis. Journal of Financial Economics, 20, 293–315.

Murphy, K. J. (1985). Corporate performance and managerial remuneration: An empirical analysis. Journal of Accounting and Economics, 7(1–3), 11–42.

Navissi, F., Sridharan, V. G., Khedmati, M., et al. (2017). Business strategy, over-(under-) investment, and managerial compensation. Journal of Management Accounting Research, 29(2), 63–86. https://doi.org/10.2308/jmar-51537

Stulz, R. M. (1990). Managerial discretion and optimal financing policies. Journal of Financial Economics, 26(1), 3–27. https://doi.org/10.1016/0304-405X(90)90011-N

Shi, M. (2019). Overinvestment and corporate governance in energy listed companies: Evidence from China. Finance Research Letters, 30, 436–445. https://doi.org/10.1016/j.frl.2019.05.017

Wang, Y., Chen, C. R., Chen, L., & Huang, Y. S. (2016). Overinvestment, inflation uncertainty, and managerial overconfidence: Firm level analysis of Chinese corporations. The North American Journal of Economics and Finance, 38, 54–69. https://doi.org/10.1016/j.najef.2016.07.001