

# Equity Concentration and Investment Efficiency

Zheng Wei\*

East China University of Political Science and Law, Shanghai, China

\*Corresponding author email: wz1051429054@126.com

---

**Abstract:** Investment activities are the core components of a company's financial operations, and the efficiency of these investments can significantly impact the company's operational status, profitability, value creation, and future development. This article focuses on A-share listed companies, first analyzing the factors that influence the efficiency of corporate investments. It then explores the specific impact of equity concentration on inefficient investments. The study utilizes empirical analysis methods and data from A-share listed companies in non-financial industries from 2017 to 2020. The research concludes that there is a significant positive correlation between equity concentration and inefficient investments. To ensure the reliability of the empirical results, robustness tests were conducted on the sample regression results.

**Keywords:** Equity concentration, Internal control, Investment efficiency, Empirical.

---

## 1. Introduction

Investment activities are a crucial component of financial management for companies. Efficient investments enable companies to excel in fierce market competition. Currently, the domestic capital market system is still evolving, and most listed companies face issues related to inefficient investments, including underinvestment and inefficient capital allocation. Underinvestment can cause companies to miss valuable growth opportunities, hinder profitability improvements, and limit the increase in company value. On the other hand, inefficient investments burden companies by wasting precious and limited resources, which can lead to financial crises. These irrational and inefficient investment behaviors result in significant losses for companies, impede their healthy development, and undermine the fundamental interests of investors. Therefore, exploring effective ways and methods to curb inefficient investments holds significant practical significance.

The separation of ownership and control in listed companies has led to issues such as information asymmetry and agency costs, resulting in various conflicts within companies, such as shareholder-manager and controlling shareholder-minority shareholder conflicts. Managers may misuse their authority to invest funds in non-profitable projects for their personal gain, building their "business empires" at the expense of the company's interests. Controlling shareholders may also use their control over corporate decision-making, along with unfair practices like related-party transactions, to exploit the wealth of minority shareholders, all of which can lead to inefficient investments. In the context of China's economic transformation, listed companies often exhibit a typical concentrated ownership structure, with many state-owned enterprises facing governance issues where a single dominant shareholder holds a significant stake. When a company has a high degree of equity concentration, the main conflict of agency problems shifts from shareholder-manager conflicts to controlling shareholder-minority shareholder conflicts. In such situations, controlling shareholders can control the company's operations and management, potentially weakening or suppressing the oversight function of minority shareholders. Without strong

internal control mechanisms and corporate governance structures, controlling shareholders are more likely to engage in inefficient investments for their own benefit, thereby harming the interests of the company and minority shareholders. Therefore, the impact of equity concentration in listed companies on inefficient investments should not be underestimated and requires the attention of researchers. Corporate governance and a company's investment behavior are closely interconnected, with internal control playing an increasingly vital role in a company's operational and developmental processes. Since the release of the "Internal Control Integrated Framework" by the COSO Committee, the Chinese government has also introduced the "Basic Standards for Enterprise Internal Control" and the "Guidelines for Supporting Enterprise Internal Control" in 2008 and 2010 respectively. These initiatives have aimed to guide and supervise listed companies in establishing robust internal control systems. Internal control effectively regulates the behavior of company employees, defines responsibilities and rights, and achieves a balance of power among various stakeholders through a range of institutional arrangements, such as authorization and approval systems, internal audit systems, and more. It serves to prevent and mitigate conflicts of interest between shareholders and managers, controlling shareholders and minority shareholders, and constrains the investment activities of all parties, ensuring the scientific and efficient decision-making of corporate investments.

With this context in mind, this article primarily focuses on the impact of equity concentration in listed companies on inefficient investments. Simultaneously, it integrates the study of internal control into the relationship between these factors, analyzing how internal control influences the mechanism of equity concentration. The research presented in this article will offer recommendations for addressing issues related to equity concentration and inefficient investments in corporate management. It will guide companies in optimizing their governance structures, introducing diverse investment entities, and simultaneously strengthening their internal control systems. Only through these measures can inefficient investments be avoided, and investment efficiency improved.

## 2. Theoretical Basis and Literature Review

### 2.1. Research on equity concentration and investment efficiency

Investment activities can create wealth for a company and enhance its value. The efficiency of these investment activities directly determines whether the investment projects can yield high returns and generate substantial profits for the company, thus maximizing its value. Similar to the definition of efficiency, investment efficiency refers to the ratio of the returns obtained from a company's investments to the resources, including capital, invested. The higher the investment efficiency, the more returns a company can generate with a given amount of investment, resulting in greater profits. Jensen (2019) argues that in a normal capital market, as long as a company invests in projects with positive net present value (NPV), it can be considered an efficient investment. However, in practice, there are differences between theory and the actual operational situations of companies. Due to issues such as information asymmetry and agency conflicts, many publicly traded companies exhibit varying degrees of inefficient investment behavior. This not only leads to investment failures but also results in the wastage of the company's resources, harming its interests.

Inefficient investments can be categorized into two types: underinvestment and overinvestment. Underinvestment means that a company foregoes projects with positive NPV that could benefit its future development. Overinvestment, on the other hand, occurs when a company's investments exceed its own resources or capabilities, deviating from its future growth direction and investing in projects with negative NPV, which can lead to losses for the company. In the context of publicly traded companies, inefficient investment behavior primarily refers to actions taken by the company's management or controlling shareholders who have decision-making authority over the company's production and operations. They may use their power to directly or indirectly influence the establishment of the company's internal control system, the design of operational mechanisms, or the arrangement of decision-making procedures, thereby engaging in investment activities that harm the interests of the company or minority shareholders. Such inefficient investment behavior not only results in most investment projects failing to achieve the desired results but can also force the company to make additional investments to achieve expected returns. This can lead to a serious phenomenon known as "vicious capital expansion," causing significant, difficult-to-estimate losses to the company's development.

The relationship between ownership concentration and investment efficiency has been the subject of research, but existing literature diverges in terms of its starting point, variables, and measurement methods, leading to inconsistent and even contradictory research findings. Foreign scholars hold two different views on this issue. Some scholars believe there is a significant negative relationship between ownership concentration and corporate investment efficiency. For example, Almeida and Wolfenzon (2005) conducted a study on corporate ownership structures and found that high ownership concentration places large shareholders in a dominant and core position, which can lead to overinvestment in pursuit of aggressive returns or underinvestment to reduce private costs. Aggarwal and Samwick (2006) argue that when

controlling shareholders have absolute decision-making power, they often influence investment decisions made by managers, directing investments towards projects that serve their own interests, which can result in low investment efficiency and a deviation in the company's value. Empirical analyses by Pindado (2005) indicate that reasonable ownership concentration incentivizes large shareholders to enhance their supervision of managerial activities, leading to rational investment decisions by managers. However, in situations of high ownership concentration, there can be an exacerbation of agency conflicts between large and minority shareholders, leading to increased inefficient investment behavior.

Domestic literature in China has also put forth two different viewpoints. Some studies argue that an increase in ownership concentration leads to a decrease in corporate investment efficiency. Huang Lei et al. (2011) argue that in China's immature capital market, with weak internal control and external monitoring capabilities, many companies have imperfect corporate governance mechanisms, and ownership concentration is common. The largest shareholder often has high control and decision-making power and may have the intention and ability to satisfy personal interests through improper means like misusing funds, leading to irrational and inefficient investment behavior. However, there are also studies suggesting that the relationship is not simply linear and may exhibit non-linear patterns. Chen Gongrong and Xu Wei (2011) analyzed data from A-share manufacturing companies listed on the Shanghai and Shenzhen stock exchanges between 2005 and 2007. They found that corporate investment efficiency initially increased, then decreased, and then increased again as the ownership concentration of the largest shareholder increased, exhibiting an "N"-shaped curve relationship.

### 2.2. Research on internal control and investment efficiency

As a company's range of activities, including production, sales, investment, and financing, continues to expand and evolve, and as new business lines are added, the need for corporate governance becomes increasingly urgent. Corporate governance involves supervising and regulating the internal operational activities of a company through methods such as authorization, approval, and process control, allowing the company to develop and operate in an orderly and organized manner. Within corporate governance, internal control has consistently been a critically important component. Internal control refers to the methods, measures, and means employed by a company or business unit to achieve its business objectives, safeguard the security and integrity of assets, ensure the accuracy and reliability of accounting information, and effectively implement its business strategies, enabling efficient and orderly business operations. In 1992, the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in the United States released the "Internal Control - Integrated Framework." The publication of this framework marked a new stage in the development of internal control. This framework provided a standardized definition of internal control and divided it into five key components, including the control environment, risk assessment, control activities, information and communication, and monitoring. Subsequently, internal control garnered broader attention worldwide, prompting scholars to conduct in-depth research

and empirical studies. It also led to the development of internal control assessment systems and comprehensive risk management practices, among other related topics.

Based on the existing relevant research literature, both domestic and international scholars mostly examine the impact of internal control on investment efficiency based on agency theory and information asymmetry theory. They have reached a relatively consistent conclusion that high-quality internal control can significantly improve a company's investment efficiency. This viewpoint is widely recognized in both theoretical and practical circles. Foreign scholars tend to believe that internal control primarily enhances the level of investment efficiency in companies by reducing the degree of information asymmetry. Doyle et al. (2007) argue that as the effectiveness of internal control design and implementation improves, the quality of financial reporting significantly increases, effectively mitigating information asymmetry and alleviating the problem of low investment efficiency due to financing constraints. Ashbaugh-Skaife et al. (2008) found that if a company's internal control design and implementation system has significant or material defects but corrects these defects in subsequent years, the effectiveness of its internal control is enhanced, and the quality of accounting information improves. David De Angelis (2016) conducted a study on the relationship between internal control and inefficient investment using U.S. listed companies from 2001 to 2006 as a sample. Empirical results indicate that information asymmetry is a fundamental reason for many cases of inefficient investment. He further points out in subsequent research that the Sarbanes-Oxley Act introduced in the United States effectively limits and constrains the occurrence of inefficient investments, leading to favorable developments in the country's capital markets and capital allocation efficiency.

### **3. Theoretical Analysis and Research Hypotheses**

#### **3.1. The relationship between equity concentration and investment efficiency**

Due to the current immaturity of China's capital market, the government and relevant regulatory authorities have not yet formulated comprehensive policies and documents related to protecting the interests of external investors. Small and medium-sized shareholders lack sufficient motivation to supervise the company's operations. On the other hand, major shareholders or controlling shareholders hold a higher proportion of shares and have a closer interest in the invested company. Therefore, they have a stronger incentive to oversee the company's production and operations, restrain and balance the actions of the management, to some extent, alleviating the principal-agent problems caused by the separation of ownership and control. However, the emergence of dominant controlling shareholders, with excessively high ownership stakes, also grants them excessive control over the company, which brings about many adverse effects on the company's development.

Research has found that the majority of listed companies in China have controlling shareholders. These controlling shareholders, due to their ownership of the highest proportion of shares, hold the control of the listed companies and enjoy absolute decision-making power. Compared to other small and medium-sized shareholders, controlling shareholders not

only share in the company's profits based on their shareholding percentage but also use their control to seek private benefits. These private benefits are obtained by infringing on the interests of small and medium-sized shareholders, resulting in excess returns. Of course, controlling shareholders have to incur certain costs in seeking these private benefits, such as making continuous investments to maintain control, the cost of gathering information, supervising management behavior, and the risk of potential legal lawsuits, among others. It's evident that the more private benefits controlling shareholders seek, the greater the costs they incur. To maximize their own interests, controlling shareholders will naturally prefer larger enterprise sizes, which is reflected in their investment behavior. Investment decisions under the control of controlling shareholders tend to lean towards expanding investment levels to gain larger control-related benefits. Controlling shareholders typically adopt diversified and related-party transaction investment approaches, and this strong tendency towards overinvestment can have a serious negative impact on the company's development.

Based on the above analysis, this paper proposes the following research hypotheses:

H1: Under certain other conditions, equity concentration is positively correlated with inefficient investment.

#### **3.2. The impact of internal control on the relationship between equity concentration and investment efficiency**

Internal control, as an integral part of corporate governance, encompasses a comprehensive system and measures. It ensures a reasonable allocation of rights and responsibilities within the company through mechanisms such as separating incompatible roles and authorization approval. Methods like budget management and the establishment of an audit committee can be used to supervise controlling shareholders and management. Therefore, when establishing and implementing internal control systems, companies should strictly adhere to the principle of power balance in aspects such as corporate structure planning and departmental design. This ensures the effectiveness of internal control, constrains the behavior of controlling shareholders, suppresses their tendencies towards inefficient investments, enhances the scientific nature of the company's investment strategy, and safeguards the company's investment returns. In this way, a scientifically sound internal control system can create a well-ordered internal environment for the company, establish a standardized and effective governance structure and decision-making mechanism, and provide a series of rules and authorities to constrain and supervise management and shareholders. In situations with a high concentration of equity, it can prevent major shareholders from making investment decisions, either individually or in collusion, that harm the interests of small and medium-sized shareholders and the company for their own benefit, thus avoiding inefficient investments.

Based on the above analysis, this paper proposes the following research hypotheses:

H2: Under certain other conditions, internal control can weaken the positive correlation between equity concentration and inefficient investment.

## 4. Variable Definition and Model Design

### 4.1. Sample selection and data sources

This study focused on A-share listed companies on the Shanghai and Shenzhen stock exchanges from 2017 to 2020 as its research subjects. The internal control index data was sourced from the Di Bo Internal Control and Risk Management Database, while all financial data were obtained through the CSMAR. Data organization and statistical analysis were conducted using Excel and Stata 15 software. Additionally, this study applied Winsorization (Winsor2) to all continuous variables, limiting both tails to 1% to handle extreme values.

During the sample selection process, the following data treatments were applied:

1. Exclusion of companies simultaneously issuing B-shares and H-shares because A-share disclosure might be influenced by B-shares and H-shares.

2. Exclusion of ST and PT stocks due to the potential significant bias they can introduce to the statistical results as a result of extreme values.

3. Exclusion of companies in the financial and insurance industries because listed companies in these sectors have special characteristics in terms of compensation assessment and performance evaluation, which differentiate them from general enterprises.

As a result, the study ended up with a total of 1,298 listed companies, yielding 5,192 valid observations.

### 4.2. Variable definitions

#### 4.2.1. Investment efficiency

This study employed regression analysis to quantify the investment efficiency of listed companies, drawing inspiration from Richardson's (2006) residual measurement model and models developed by Fang Hongxing and others in 2013.

The specific calculation formula is:

$$INV_{i,t} = \alpha_0 + \alpha_1 \times Cash_{i,t-1} + \alpha_2 \times GROWTH_{i,t-1} + \alpha_3 \times LEV_{i,t-1} + \alpha_4 \times SIZE_{i,t-1} + \alpha_5 \times RET_{i,t-1} + \alpha_6 \times AGE_{i,t-1} + \alpha_7 \times INV_{i,t-1} + \alpha_8 \sum YEAR + \alpha_9 \sum IND + \varepsilon_{i,t} \quad (1)$$

*INV* represents the incremental investment, calculated as the difference between the cash paid for purchasing fixed assets, intangible assets, and other long-term assets by company *i* in year *t* and the cash received from the disposal of fixed assets, intangible assets, and other long-term assets, divided by the initial total assets. *Cash* represents the amount of cash held, i.e., the monetary funds of company *i* at the end of year *t-1* divided by the total assets. *GROWTH* represents growth ability, calculated as the revenue growth rate of company *i* in year *t-1*, which is the difference between the current year's revenue and the previous year's revenue divided by the previous year's revenue. *LEV* represents debt-paying ability, i.e., the asset-liability ratio of company *i* in year *t-1*. *SIZE* represents company size, calculated as the natural logarithm of the total assets of company *i* in year *t-1*. *RET* represents the stock return rate of company *i* in year *t-1*. *AGE* represents the number of years company *i* has been listed up to the end of year *t-1*.

#### 4.2.2. Internal controls

This paper selects the internal control index of Dibo/100 as a proxy variable, because the index is authoritative and can be used as a visual reference, which can comprehensively reflect the internal control level of listed companies.

#### 4.2.3. Equity concentration

In existing literature, there are primarily two methods used to measure equity concentration. The first method is to directly sum the ownership percentages of the largest shareholder, the top three, top five, or top ten shareholders. The second method involves using the Herfindahl-Hirschman Index (HHI), which is calculated as the sum of the squares of the ownership percentages of the top shareholders. This study has chosen to use the ownership percentage of the largest shareholder to measure equity concentration. This choice is made because it represents the standard definition of equity concentration and is widely accepted and used by scholars both domestically and internationally. In robustness tests, the study also uses the square of the ownership percentage of the largest shareholder as a substitute measure for the Herfindahl-Hirschman Index. This is done because the HHI can highlight the differences in ownership percentages more significantly and effectively compensate for the limitation of using only the ownership percentage of the largest shareholder, ultimately leading to more accurate analytical results.

#### 4.2.4. Variables

**Table 1.** Variables

Variable Type	Variable Name	meaning
Explained variable	AINVT	For non-efficiency investment, take the absolute value of the residual of model (1).
	TOP	
Explanatory variables	IC	Equity concentration
	SIZE	Internal control quality
	ROE	Enterprise size
	GROWTH	Return on equity
Control variables	TBQ	Total asset growth rate
	LEV	Tobin Q value
	IND	Gearing ratio
	YEAR	Industry variables
		Year variable

### 4.3. Model building

In order to explore the influence of equity concentration on investment efficiency and verify whether the hypothesis H1

$$AINVT_{i,t} = \alpha_0 + \alpha_1 \times TOP_{i,t} + \alpha_2 \times SIZE_{i,t} + \alpha_3 \times ROE_{i,t} + \alpha_4 \times GROWTH_{i,t} + \alpha_5 \times TBQ_{i,t} + \alpha_6 \times LEV_{i,t} + \sum YEAR + \sum IND + \varepsilon_{i,t} \quad (2)$$

In order to test the moderating effect of internal control on the relationship between equity concentration and investment efficiency, and to

$$AINVT_{i,t} = \alpha_0 + \alpha_1 \times TOP_{i,t} + \alpha_2 \times IC_{i,t} + \alpha_3 \times ICTOP_{i,t} + \alpha_4 \times SIZE_{i,t} + \alpha_5 \times ROE_{i,t} + \alpha_6 \times GROWTH_{i,t} + \alpha_7 \times TBQ_{i,t} + \alpha_8 \times LEV_{i,t} + \sum YEAR + \sum IND + \varepsilon_{i,t} \quad (3)$$

## 5. Empirical Analysis

### 5.1. Descriptive statistical analysis

Table 2 presents the descriptive statistics for the main variables, providing an overview of the overall distribution of these variables. The mean of non-efficiency investment is 0.0314, indicating a relatively severe overinvestment phenomenon among listed companies. The maximum value of 0.289 and the minimum value of 0.0001 show significant differences in investment efficiency among listed companies. Among the internal control variables, the mean is 6.440, with a difference greater than 9 between the maximum and minimum values. This suggests that the overall internal control level of listed companies in China is moderate and requires further strengthening of internal control implementation. The mean of the ownership percentage of the largest shareholder is 0.325, with a maximum value of 0.891 and a minimum value very close to 0. This indicates a high

is valid, based on the above variables, this paper constructs a regression estimation model (2):

verify whether the hypothesis H2 is valid, based on the above variables, this paper constructs a regression estimation model (3):

overall equity concentration among A-share listed companies, with significant individual variations, providing a good opportunity for this study. For the growth indicator GROWTH, the maximum value is 423.0, the minimum value is -11.68, with a large numerical difference, and some companies exhibit negative growth, highlighting concerns about their growth prospects. The standard deviation of 6.523 indicates a high level of dispersion in the growth characteristics of the sample companies. The average value of the asset-liability ratio LEV is 0.495, with a minimum value of 0.0131 and a maximum value of 0.990, showing significant differences in the debt levels among listed companies. The Tobin's q value TBQ has a minimum of 0.0375 and a maximum of 28.93, demonstrating substantial differences in Tobin's q values among the listed companies. The average return on equity ROE is 0.0622, with a maximum of 2.379 and a minimum of -4.32, indicating significant variations in the return on equity among listed companies.

**Table 2.** Descriptive statistical results for major variables

VARIABLES	N	mean	sd	min	max
AINVT	5,192	0.0314	0.0369	0.0001	0.289
TOP	5,192	0.325	0.146	0.0300	0.891
SIZE	5,192	22.92	1.351	19.21	28.64
GROWTH	5,192	0.495	6.523	-11.68	423.0
LEV	5,192	0.450	0.193	0.0131	0.990
TBQ	5,192	1.465	1.580	0.0375	28.93
ROE	5,192	0.0622	0.165	-4.320	2.379
IC	5,192	6.440	1.096	0	9.413

### 5.2. Correlation analysis

The Pearson correlation coefficients for the main variables are presented in Table 3. The correlation coefficient between equity concentration and non-efficiency investment is 0.038, and it is significant at the 1% level. This suggests that an increase in equity concentration leads to an increase in non-efficiency investment, providing preliminary support for H1. The correlation coefficient between the internal control index and non-efficiency investment is -0.01, but it is not

significant. This indicates that the enhancement of internal control variables in a company does not seem to have a significant impact on suppressing non-efficiency investment. The correlation coefficient between company size and non-efficiency investment is -0.033, and it is significant at the 5% level. This suggests that larger companies tend to have a weaker tendency towards non-efficiency investment. The correlation coefficient between the asset-liability ratio and non-efficiency investment is -0.027, and it is significant at the 5% level.

**Table 3.** Correlation analysis

	AINVT	TOP	IC	SIZE	GROWTH	ROE	LEV	TBQ
AINVT	1							
TOP	0.038 ***	1						
IC	-0.0100	0.168***	1					
SIZE	-0.033 **	0.252***	0.241 ***	1				
GROWTH	0.033 **	0.030**	0.0170	0.014	1			
ROE	0.038 ***	0.147***	0.339 ***	0.152 ***	0.0160	1		
LEV	-0.027 **	0.071***	0.0110	0.533 ***	0.046 ***	-0.106 ***	1	
TBQ	0.075 ***	- 0.040***	0.0210	-0.342 ***	-0.0140	0.165 ***	-0.414 ***	1

### 5.3. Regression analysis

#### 5.3.1. Empirical results and analysis of equity concentration on inefficient investment

The results of the OLS multiple regression model (Model 2) for equity concentration and investment efficiency are presented in Table 4. Looking at the regression results for the full sample, the coefficient of equity concentration on the absolute value of non-efficiency investment is 0.0121, and it is significant at the 1% level. This indicates that high equity concentration significantly increases a company's non-efficiency investment, meaning that equity concentration is negatively correlated with investment efficiency. This result confirms hypothesis H1.

Examining the regression results for the control variables, company size and non-efficiency investment are both significantly negatively correlated at the 1% confidence level, indicating that larger companies tend to have a reduced tendency towards non-efficiency investment, leading to an optimization of resource allocation. Total asset growth rate is significantly positively correlated with underinvestment at the 1% level, suggesting that companies with higher total asset growth rates are more likely to experience underinvestment. Tobin's q value is significantly positively correlated with non-efficiency investment at the 1% level, indicating that this factor exacerbates the problem of non-efficiency investment in companies.

**Table 4.** Model 2 regression results

VARIABLES	AINVT
TOP	0.0121*** (3.35)
SIZE	-0.0001 (0.16)
GROWTH	0.0002*** (2.61)
ROE	0.0045 (1.38)
LEV	0.0037 (1.12)
TBQ	0.0018*** (4.88)
YEAR	-0.0037*** (-8.12)
IND	-0.0001*** (-3.82)
Constant	0.2153*** (4.60)
Observations	5,192
R-squared	0.024

### 5.3.2. Empirical results and analysis of equity concentration, internal control and inefficient investment

Based on the results of the multiple regression model (Model 3), including the interaction term between equity concentration and internal control, the regression results are shown in Table 5. The coefficient for equity concentration TOP is 0.0015, and it is significant at the 5% level, indicating that equity concentration is still significantly positively correlated with non-efficiency investment. At the same time, the coefficient for the interaction term between equity concentration and internal control (TOP\*IC) is -0.0015, and it is significant at the 1% level. This suggests that this interaction term is negatively correlated with non-efficiency investment and is relatively significant. Internal control has a negative impact on the positive relationship between equity concentration and non-efficiency investment. This confirms hypothesis H2. Other control variables show results that are generally consistent with those from Models 2 and 3 and do not require further explanation.

The higher a company's internal control level, the smaller the positive effect of equity concentration on non-efficiency investment. Internal control systems create a well-ordered control environment for the company, leading to the establishment of a rational organizational structure and decision-making mechanism. This helps prevent major shareholders from investing in projects with poor liquidity and returns for their personal gain, reduces non-efficiency investment behaviors caused by agency problems and information asymmetry issues, and effectively mitigates the negative impact of equity concentration on non-efficiency investment.

**Table 5.** Model 3 regression results

VARIABLES	AINVT
TOP	0.0015** (2.28)
IC	-0.0053*** (-57.67)
ICTOP	-0.0015*** (-392.08)
SIZE	0.0003*** (2.98)
GROWTH	-0.0000 (-1.00)
ROE	-0.0004 (-0.69)
LEV	-0.0007 (-1.15)
TBQ	0.0003*** (4.09)
YEAR	-0.0003*** (-3.06)
IND	0.0000 (1.24)
Constant	0.0201** (2.37)
Observations	5,192
R-squared	0.968

## 6. Robustness Test

The regression results for robustness tests are presented in Table 6. In these robustness tests, the study added the variable Management Expense Ratio (MF) to make the control variables more comprehensive and to ensure more accurate results. The empirical results demonstrate that the coefficient of equity concentration on non-efficiency investment is 0.0117, and it is significant at the 1% confidence level. This indicates that equity concentration significantly increases non-efficiency investment behavior in companies, supporting the previous hypothesis. It suggests that the research conclusions in this study are robust and applicable.

In this robustness test, the results obtained from the regression model are generally consistent with the previous findings. Therefore, it can be concluded that the research results in this study are robust, even when potential sources of interference are considered.

**Table 6.** Robustness tests

VARIABLES	AINVT
TOP	0.0117*** (-3.23)
SIZE	0.0002 (0.49)
GROWTH	0.0002*** (2.59)
ROE	0.0059* (1.80)
LEV	0.0043 (1.29)
TBQ	0.0016*** (4.48)
MF	0.0150*** (3.66)
year	-0.0036*** (-7.80)
IND	-0.0001*** (-4.12)
Constant	0.2241*** (4.78)
Observations	5,192
R-squared	0.027

## 7. Research Conclusion

This study, focusing on A-share listed companies in China from 2017 to 2020 and examining the impact of equity concentration on non-efficiency investment from an internal control perspective, draws the following conclusions:

1. China's listed companies exhibit a significant issue of excessively concentrated equity, where the "one-shareholder dominance" problem is widespread. Simultaneously, non-efficiency investment has become increasingly serious, negatively impacting the healthy and sustainable development of these companies. Thus, addressing the need to reform the equity structure, reduce equity concentration, enhance investment efficiency, and curb overinvestment is imperative.

2. Equity concentration is significantly positively correlated with non-efficiency investment. The higher the level of equity concentration, the more severe the problem of non-efficiency investment within a company. Currently, the core issue in corporate governance is the agency conflict between controlling shareholders and minority shareholders. In this context, as the ownership percentage continues to rise, controlling shareholders can exert more influence on company management decisions. This weakens the checks and balances from minority shareholders, allowing controlling shareholders to engage in "asset stripping" behavior with greater impunity. Consequently, non-efficiency investment problems become more pronounced, leading to reduced investment efficiency and potential financial distress for the company.

3. Internal control is significantly negatively correlated with non-efficiency investment. Higher levels of internal control can mitigate the agency conflicts between shareholders and management, as well as between controlling shareholders and minority shareholders. It also helps alleviate information asymmetry issues between the company and the external market, contributing to the suppression of non-efficiency investment and the enhancement of investment efficiency.

4. Internal control, as a moderating variable, effectively weakens the positive effect of equity concentration on non-efficiency investment. As a critical component of corporate governance, strong internal control mechanisms, such as authorization and approval processes, budget management, and the establishment of audit committees and supervisory boards, can mitigate agency conflicts between controlling shareholders and minority shareholders. This reduction in agency conflicts diminishes non-efficiency investment driven by controlling shareholders seeking personal gain. In summary, high-quality internal control mechanisms can curb

non-efficiency investment resulting from excessively concentrated equity.

## References

- [1] Aggarwal R K, Samwick A A. Empire-builders and shirkers: investment, firm performance, and managerial incentives[J]. *Journal of Corporate Finance*, 2006, 12(3): 489-515.
- [2] Almeida H, Wolfenzon D. The effect of external finance on the equilibrium allocation of capital[J]. *Journal of Financial Economics*, 2005, 75(1): 133-164.
- [3] Ashbaugh Skaife H, Collins D W, Kinney Jr W R, et al. The effect of sox internal control deficiencies and their remediation on accrual quality[J]. *The accounting review*, 2008, 83(1): 217-250.
- [4] De Angelis D, Grinstein Y. Relative performance evaluation in ceo compensation: a non-agency explanation[R]. Working paper, 2016.
- [5] Doyle J T, Ge W, Mcvay S. Accruals quality and internal control over financial reporting[J]. *The accounting review*, 2007, 82(5): 1141-1170.
- [6] Jensen M C, Meckling W H. Theory of the firm: managerial behavior, agency costs and ownership structure[A]. *Corporate governance[M]*. Gower, 2019: 77-132.
- [7] Pindado J, De la Torre C. A complementary approach to the financial and strategy views of capital structure: theory and evidence from the ownership structure[J]. Available at SSRN 666167, 2005.
- [8] Chen, Gongrong, and Xu Wei. "An Empirical Study on the Relationship between Characteristics of Major Shareholders and Corporate Investment Efficiency." *Friends of Accounting*, 2011(01), 99-104.
- [9] Huang, Lei, Mou Shaobo, and Ye Yong. "Analysis of the Impact of Equity Structure on the Investment Behavior of Listed Companies." *Economic System Reform*, 2011(06), 138-140.