Asian Journal of Economic Modelling
ISSN(e): 2312-3656
ISSN(p): 2313-2884
DOI: 10.55493/5009.v12i2.5050
Vol. 12, No. 2, 124-137.

URL: www.aessweb.com

Equity pledge of controlling shareholders and investment structure

Qianqi Duan[1+]
Normaziah Mohd Nor[2]
Aslam Izah Selamat[3]

[1,2,3]*School of Business and Economics, Universiti Putra Malaysia, Serdang, Malaysia.*
[1]*Email: gs61598@student.upm.edu.my*
[2]*Email: mazzziah@upm.edu.my*
[3]*Email: aslamizah@upm.edu.my*
[1]*School of Economics and Management, ChangSha Normal University, ChangSha, China.*


(+ Corresponding author)

Article History
Received: 14 December 2024
Revised: 8 February 2024
Accepted: 27 February 2024
Published: 18 April 2024

Keywords
Controlling shareholder
Equity pledge
Financial investments
Investment structure
Ownership nature
Physical investments.

JEL Classification:
G32; G34.

ABSTRACT

This study aims to explore the influence of the controlling shareholders' equity pledge on the company's investment structure and simultaneously investigate the regulatory effect of the ownership nature on the controlling shareholders' equity pledge and investment structure. We take China Shanghai and Shenzhen A-share listed companies as the research object, covering the data from 2013 to 2021, including 14,870 firm-year observations. The results show that the stock pledge behavior of the controlling shareholder tends to encourage the company to make more financial investments than physical investments. In addition, we find that ownership nature helps alleviate the above relationship to a certain extent. It is worth noting that non-manufacturing companies and non-big4 companies have a stronger positive impact on the company's investment structure than manufacturing companies and big4 companies. Finally, we also test the robustness of the research results using the propensity score matching method and the adding control variables method, which is consistent with the results of the baseline regression analysis. The proportion of equity pledged by controlling shareholders should be controlled, especially when the proportion of financial assets in the company's investment structure is too high. This measure can reduce the risk of financialization and maintain the stability of the financial market.

Contribution/ Originality: From the perspective of controlling shareholders' equity pledges, it fills the academic literature gap that affects the company's investment structure and enriches the cognition of the economic consequences of equity pledges. In addition, it enriches the relevant literature on the ownership nature of shareholders.

1. INTRODUCTION

The financial trend of China's market economy has been noticeable (Wu & Wu, 2020; Zhou et al., 2021). From a macro perspective, the scale of the financial sector is expanding daily, and the proportion of the financial industry in the national economy is on the rise. By the end of 2022, the total assets of non-bank financial institutions in China reached 152.6 trillion yuan, up 18.5% year-on-year, accounting for 29.8% of the total assets of national financial institutions. The added value of China's financial industry accounts for 7.8% of GDP, much higher than the global average of 4%.

From the perspective of microenterprises, economic financialization is highlighted by the fact that entity enterprises invest a large amount of holding funds in financial assets to pursue short-term excess returns. By the

end of 2022, the investment scale of trading financial assets and available-for-sale financial assets of non-financial A-share listed companies reached 2.09 trillion. There are 2959 non-financial A-share listed companies involved in the financial field, accounting for more than half the number of A-share listed companies. This phenomenon shows that corporate financialization generally exists in non-financial listed companies in China. Although financial development is in many fields, such as improving the efficiency of capital use, promoting capital accumulation, easing financing constraints, and absorbing social employment (Abdul Bahri, Shaari Md Nor, Sarmidi, & Haji Mohd Nor, 2019; Asongu, 2012), it has played an important role that cannot be ignored. However, economic financialization has caused problems such as economic fragility, bubbles, and a mismatch between finance and the real economy (Banerjee, Bose, & Rath, 2019), attracting close attention from practical and academic circles.

According to the investment substitution theory (Duménil & Lévy, 2004), the total amount of investable cash in an enterprise is limited, and the business management of an enterprise is aimed at maximizing profits. Due to resource constraints, enterprises will also prefer to invest in financial asset with excess returns, reducing the resources for industrial investment. Therefore, there is a substitution between financial asset investment and industrial investment (Huang, Luo, & Peng, 2021; Xu, Mu, & Wang, 2023). Compared with fixed assets, research and development investment, and other industrial investments, financial assets investment can gain returns in a short time, and the return on investment is high (Demir, 2009). Moreover, financial assets have strong liquidity, can be quickly realized in the short term, and can play the role of cash (Ma, Shen, Wang, & Wu, 2022; Zhang, Zhou, & Tian, 2022). These are the reasons why listed companies prefer to invest in financial assets.

Meanwhile, equity pledges are prevalent in China's capital market as a new financing method for creditor's rights. Shareholders use their company shares as collateral for financing or loans from banks, securities companies, or other financial institutions. Equity pledges can alleviate the financing constraints of listed companies (Xiao, Chen, Fang, & Zhang, 2021; Zhu, Xia, & Zheng, 2021). As the largest shareholder of a listed company, can the equity pledge of the controlling shareholder alleviate the preference of the company's investment structure for financial assets? It is a question worth thinking about.

The existing research on corporate investment mainly focuses on external factors such as a country or region's politics, economy, and culture and the macro level of uncertainty of these external factors. When the macro-environmental uncertainty increases, enterprises face more significant operational risks, and in order to maintain stable income, enterprises will be prompted to increase investment in financial assets (Demir, 2009; Kaplan, Özmen, & Yalç, 2006). The micro-level factors mainly include corporate governance structure and management characteristics. Regarding management characteristics, Malmendier and Tate (2005) found that the overconfidence of management led to the distortion of company investment. Therefore, the research gap is that little literature exists on the investment structure from the perspective of controlling shareholders' equity pledges.

Based on the investment substitution theory, we study the relationship between the controlling shareholder's equity pledge and the company's investment structure. Secondly, the moderating effect of ownership nature on the relationship between the equity pledge of the controlling shareholder and the company's investment is investigated. Thirdly, the heterogeneity is analyzed based on the nature of the industry and whether the Big4 audit. Finally, the robustness of the baseline study is tested by using the tendency score matching method and increasing control variables.

The primary contribution of this paper is to expand the research perspective on the impact of investment structure. From the perspective of controlling shareholder's equity pledges, it fills the academic literature gap that affects the company's investment structure. Traditional literature often focuses on the macroeconomic environment (Guo, Wei, Zhong, Liu, & Huang, 2020; Kim & Kung, 2017) and the investment structure while ignoring the role of corporate financing as a critical factor. This study provides a new theoretical perspective for us to understand the shaping mechanism of the company's investment structure more comprehensively by deeply discussing the equity pledge of the controlling shareholder.

Secondly, it enriches the cognition of the economic consequences of an equity pledge. The previous literature mainly focused on the controlling shareholders' equity pledge to the company's investment efficiency (Huang, Li, & Zhao, 2022; Mu, Zhou, & Cao, 2020)mergers and acquisitions(Duan, Nor, & Selamat, 2023; Li & Li, 2022), but there is little research on corporate investment structure. Our research provides a deeper insight into the influence of the equity pledge on the company's investment strategy.

Finally, it enriches the relevant literature on the ownership nature of shareholders. Our research provides more insights to help better understand how ownership nature plays a role in the controlling shareholders' equity pledge and the investment structure of the company.

The remaining five parts of the study are organized as follows: Literature review and hypothesis development are in Section 2. Section 3 is the methodology. Empirical results are in Section 4. Robustness analysis and heterogeneity analysis are discussed in Section 5. Section 6 is the conclusion.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Investment Substitution Theory

The investment substitution theory was put forward by Duménil and Lévy (2004) in their book Capital Resume: Roots of the Neonatal Revolution. This book analyzes the income distribution between financial capital and physical capital, pointing out that the income of financial capital mainly comes from interest and dividends. In contrast, the income from physical capital mainly comes from operational profits. When the interest rate is higher than the profit rate, enterprises will reduce their physical investment and switch to financial investment, leading to the slowdown and instability of economic growth. The interests of financial capital are usually taken seriously, which leads to the short-termism of capital and the pursuit of instant benefits rather than long-term productive investment. This investment substitution effect will affect the development of the real economy and financial stability.

However, there is no denying the preventive reservoir function of the company's investment structure (Cardella, Fairhurst, & Klasa, 2021; Huang et al., 2021). The follow-up literature has supported (Duménil & Lévy, 2004) investment substitution theory. Speculation is the potential motivation to drive enterprises to increase their holdings of non-monetary financial assets (Huang et al., 2021). Holding financial assets will aggravate the volatility and uncertainty of financial performance and squeeze out the company's capital expenditure and R&D investment (Xu et al., 2023). Jin, Mai, and Cheung (2022) found a negative correlation between the financialization of companies and the fixed investment rate. This result is consistent with the view that companies invest in financial assets and crowd out entity investment (Jiang, Shen, & Cai, 2022; Xu et al., 2023). Research results in different countries also support the investment substitution theory. Based on the data of non-financial enterprises in Turkey (Kaplan et al., 2006), they found that non-financial enterprises tend to hold financial assets for speculative reasons and have a substitute function for actual investment when the real rate of return of financial assets is too high due to macroeconomic instability. Demir (2009) analyzed the impact of the return gap between financial and fixed investments on the actual investment in three emerging markets: Argentina, Mexico, and Turkey. The empirical results show that fixed investment reduces the effect, while financial investment is the opposite. Tori and Onaran (2017) found that the non-financial sector turned to financial activities in Western European countries. The physical investment eventually decreased, and the development of the non-financial sector was stagnant or fragile, leading to long-term productivity stagnation. In South Korea, financialization inhibits R&D investment in Korean non-financial enterprises (Seo, Kim, & Kim, 2012) and fixed investment in manufacturing enterprises (Shin, 2012). Orhangazi (2008) used the sample data of American non-financial enterprises and found that American financialization crowded out the actual investment because the increase in financial investment and financial profit changed the incentive of company managers.

2.2. Equity Pledge and Investment Structure

The prevalence of equity pledges is attributed to their advantages. Equity pledge is a vital tool to obtain loans outside the traditional banking industry (Guo, Kryzanowski, Li, & Zhang, 2021), which is conducive to alleviating the financing constraints of individuals or companies (Li, Huang, Shi, & Yang, 2022). Moreover, the equity pledge benefits shareholders by converting their shares into money, converting ownership into cash flow rights, and enjoying wealth in advance (Fabisik, 2019). In addition, equity pledges play a role in delaying tax payments (Chauhan, Mishra, & Spahr, 2021) and providing short-term cash flow for the company (Hwang, Qiao, & Ku, 2016).

Contrary to its advantages, some scholars have raised concerns about the equity pledges. Equity pledge will reduce the return on assets of the company and damage its long-term value (Ni, Fang, Liu, & Lu, 2022; Wang & Chen, 2020). Although it pushes up the stock price in the short term, it damages the company's long-term value (DeJong, Liao, & Xie, 2020). The characteristics of financial assets, short investment cycles, and high return on investment can meet the requirements of listed companies to support stock prices quickly. Therefore, companies tend to invest in financial assets in order to reduce the margin-call risk. An equity pledge intensifies the company's risk. Equity pledge is sensitive to changes in stock price, and stock price fluctuation and market instability lead to the risk of additional margin for shareholders (Chauhan et al., 2021). The risk of potential loss of control brought by an equity pledge reduces the risk tolerance of decision-makers. Moreover, Xie, Wang, Zhang, and Wang (2023) and Tian, Tang, Liu, and Qi (2024) provide empirical evidence that equity pledges exacerbate corporate financialization.

In contrast, the investment cycle of fixed assets is long, and the rate of return is low. Intangible assets have a long investment cycle and intense uncertainty in return. Therefore, the pledge of equity leads to the company's reduction of R&D and expenditure investment (Wang, Qiu, & Tan, 2020). Therefore, the hypothesis was put forward.

Hypothesis 1: The equity pledge of controlling shareholders positively affects the company's investment structure.

2.3. Moderation Role of State-Controlled Shareholder

The company's investment orientation shows a preference for financial investment, but insufficient attention is paid to entity investment, such as production equipment renewal and technological upgrading. This tendency may lead the company to fall into the investment strategy of over-financialization, adversely affecting the entity's investment and thus hindering the company's long-term development. Academic research has verified the crowding-out effect of excessive financialization on entity investment (Akkemik & Özen, 2014; Chen, Shen, Cao, & Wang, 2024; Seo et al., 2012). The trend of financialization at the micro-company level is gradually transmitted to the social and economic fields, which hurts the country's development, innovation, and social progress and causes economic fluctuations.

In order to promote the development of the real economy, the government encourages companies to invest in real entities. Because state-owned controlling shareholders are usually associated with the government (Tihanyi et al., 2019; Zhang, Wu, Feng, & Chen, 2022), they conform to the national policy in practice, prevent excessive financial risks through their influence on the company, and guide the company's entity investment. In addition, the State-owned Assets Supervision and Administration Commission of the State Council (SASAC) plays a crucial role in overseeing state-owned assets in China (Lin, Lu, Zhang, & Zheng, 2020), which makes the state-owned controlling shareholders subject to specific supervision in transferring control rights. These measures help to reduce the motivation of state-owned controlling shareholder companies to invest in financial services.

Hypothesis 2: State-controlled shareholders alleviate the relationship between controlling shareholders' equity pledge and company's investment structure.

3. METHODOLOGY

3.1. Samples and Data

This paper uses data from China's Shanghai and Shenzhen A-share listed companies from 2013 to 2021 as the research sample. On the basis of the total sample, clean the data: First, eliminate ST and *ST companies. Then, exclude financial and insurance-listed companies. Secondly, eliminate companies that have been listed for less than one year. Thirdly, ignore discontinuous data or other missing data. Finally, the quantiles of all continuous variables below 1% and above 99% are truncated. A total of 14,870 firm-year observations were collected. This paper's data on controlling shareholders' equity pledge, ownership nature of controlling shareholders, and company investment are from the China Stock Market & Accounting Research (CSMAR) database. The CSMAR database provides abundant financial, market, and corporate governance data, which makes it convenient for researchers and investors to conduct related research and monitoring.

3.2. Variable Selection

Based on Hala, Abdullah, Andayani, Ilyas, and Akob (2020), we divide the company's investment into two categories: financial asset investment and physical asset investment, in which physical asset investment refers to the cash paid by the company for purchasing fixed assets, intangible assets, and other long-term assets. Financial investment refers to the company's trading financial assets, net held-to-maturity investment, net available-for-sale financial assets, and cash to pay interest, fees, and commissions. The investment indicators of physical and financial assets come from the "cash paid by investment" in the company's cash flow statement in the CSMAR database. In this paper, the investment structure of the company is measured by dividing the investment in financial assets by the investment in physical assets. The larger the index, the higher the company's financial asset investment bias (Zhang & Wang, 2016). According to Du, Jun, and Jiali (2018) and Hu, Teng, Lin, and Li (2023), ple_dum is a dummy variable of equity pledge, which is 1 if the company has a controlling shareholder's equity pledge; otherwise, it is 0. Ple_rate, which represents the proportion of the controlling shareholder's equity pledge in the company's shares. Considering that the equity pledge's influence on the company's investment structure is lagging, the controlling shareholder's equity pledge variable lags by one period. According to Yin and Zhang (2019), the owner represents the ownership nature of the controlling shareholder. If the controlling shareholder is state-owned, it is 1; otherwise, it is 0. The variable also lags by one period. The control variables' influence on investment structure is lagging, so the control variables are also lagging for one period. The definition of control variables is shown in Table 1. Year-and industry-dummy variables are used for regression analysis.

Table 1. Measurement of variables.

Variables type	Variables name	Measure
Dependent variable	Instr	The ratio of cash paid for financial investment to cash paid for the purchase and construction of fixed assets, intangible assets, and other long-term assets.
Independent variables	Ple_dum_{t-1}	Controlling shareholders pledge their equity is 1; Otherwise, 0.
	Ple_Rate_{t-1}	The proportion of shares pledged by the controlling shareholder to the shares held by the controlling shareholder.
Moderating variables	$Owner_{t-1}$	If the controlling shareholder is state-owned, it is 1; Otherwise, it is 0.
Control variable	$Size_{t-1}$	In(Total assets).
	Lev_{t-1}	Total liabilities divided by total assets.
	Roa_{t-1}	Return on assets.
	$Cash_{t-1}$	Net cash flow from operating activities/Total assets.
	Age_{t-1}	Ln(Current year - year of listing + 1).
	Year	The dummy variable is equal to in a specific year, otherwise it is equal to 0.
	Industry	The dummy variable to control the influence of a specific industry.

3.3. Model Specification

In model selection, this paper carries out the F-Limer test ($p<0.01$), and the Hausman test ($p<0.01$), and the results show that the fixed effect model is more effective than the random effect model and the mixed effect model. Therefore, the fixed effect model is adopted to control the inherent unobservable factors of individuals (Zulfikar & STp, 2018).

To test hypotheses, the model (1) was constructed.

$$Instr_{i,t} = \alpha_0 + \alpha_1 Ple_{i,t-1} + \alpha_2 \sum Controls_{i,t-1} + \sum Year + \sum Ind + \varepsilon_{i,t} \quad (1)$$

Where Instr stands for the investment structure of the company, Ple includes two indicators: ple_dum and ple_rate. Control stands for control variables. Year and Ind represent year-fixed effects and industry-fixed effects, respectively.

To test hypothesis 2, the model (2) was constructed.

$$Instr_{i,t} = \alpha_0 + \alpha_1 Ple_{i,t-1} + \alpha_2 owner_{i,t-1} + \alpha_3 Ple_{i,t-1} * owner_{i,t-1} + \alpha_4 \sum Controls_{i,t-1} + \sum Year + \sum Ind + \varepsilon_{i,t} \quad (2)$$

Where Owner stands for the ownership nature of the controlling shareholder of the company. $\alpha_3 Ple_{i,t-1} * owner_{i,t-1}$ stands for the interaction term.

Table 2. Descriptive statistics.

Variables	Obs.	Mean	Std. dev.	Min.	Max.
Instr	14870	6.6113	20.7534	0.0000	206.9996
Ple dum	14870	0.2608	0.4391	0.0000	1.0000
Ple rate	14870	5.4495	14.2517	0.0000	84.9600
Owner	14870	0.0995	0.2993	0.0000	1.0000
Size	14870	22.4228	1.2194	20.0616	26.2494
Lev	14870	0.4366	0.1945	0.0610	0.8753
Roa	14870	0.0353	0.0566	-0.2189	0.1940
Cash	14870	0.0509	0.0649	-0.1433	0.2411
Age	14870	11.8584	6.8754	3.0000	27.0000

Note: Instr represents the investment structure. Ple_dum and ple_rate represent equity pledge. Owner represents ownership nature. Size represents company size. Lev represents the asset-liability ratio. Roa represents the return on total assets. Cash represents the cash flow ratio. Age represents the company listing age.

4. EMPIRICAL RESULTS

4.1. Descriptive Statistical Analysis

Table 2 is the descriptive statistical analysis, instr stands for the company's investment structure, with a variance of 20.75. The investment structure of listed companies in China, Shanghai, and Shenzhen is quite different. Some companies in the sample invest more than 200 times more in financial assets than in physical investments. The average ratio of this data is 6.61. It shows that investment in financial assets is widespread in the A-share market, especially since some listed companies' financial assets are much higher than those of physical investment. The variance of ple_rate is 14.25, and the highest value is 84.96, which shows a significant difference in the proportion of equity pledged by the controlling shareholders of listed companies. The controlling shareholders pledged their shares up to 80% in the sample.

Table 3. Correlation coefficient matrix.

Variables	Instr	Ple_dum	Ple_rate	Owner	Size	Lev	Roa	Cash	Age
Instr	1.000								
Ple_dum	0.037***	1.000							
Ple_rate	0.048***	0.644***	1.000						
Owner	-0.042***	-0.124***	-0.076***	1.000					
Size	-0.067***	-0.044***	-0.089***	0.192***	1.000				
Lev	-0.121***	0.013	0.011	0.135***	0.504***	1.000			
Roa	0.035***	-0.033***	-0.042***	-0.040***	0.036***	-0.326***	1.000		
Cash	-0.018**	-0.041***	-0.053***	-0.030***	0.047***	-0.182***	0.422***	1.000	
Age	0.012	-0.108***	-0.030***	0.227***	0.371***	0.283***	-0.064***	-0.016*	1.000

Note: * Stands for significant at 10%, * * stands for significant at 5% and *** stands for significant at 1%.

4.2. Correlation Analysis

It can be seen from Table 3 that the correlation coefficient between each variable is less than 0.8, and it can be considered that there are no multicollinearity problems.

4.3. Benchmark Regression

It can be found in Table 4that the coefficient of ple_dum to instr is 1.853, which is significant at the level of 1%, indicating that the existence of the equity pledge of the controlling shareholder is more biased towards the company's financial investment. The coefficient of ple_rate to instr is 0.061, which is significant at the level of 1%, indicating that the higher the proportion of controlling shareholders' equity pledge, the more the company's investment is biased towards financial investment rather than entity investment. The results are consistent with (Hou & Zheng, 2021).

Table 4. Benchmark regression.

Variables	(1)	(2)
	Instr	Instr
Ple_dum	1.853***	
	(4.122)	
Ple_rate		0.061***
		(3.681)
Size	-0.407***	-0.341**
	(-2.757)	(-2.325)
Lev	-18.095***	-18.087***
	(-13.524)	(-13.511)
Roa	1.200	1.123
	(0.345)	(0.323)
Cash	-3.781	-3.700
	(-0.997)	(-0.976)
Age	0.127***	0.114***
	(4.396)	(3.996)
_Cons	21.233***	20.011***
	(6.386)	(6.020)
Year	Yes	Yes
Industry	Yes	Yes
N	14870	14870
R^2	0.062	0.062

Note: Table 4 shows the results of benchmark regression. The values in brackets represent the t-statistics of the coefficients. ** stands for significant at 5% and *** stands for significant at 1%.

4.4. Moderation Effect of State-Controlled Shareholder

It can be found in Table 5that the interaction term of ple_dum and owner is -3.519, which is significant at the level of 1%. The interaction term of ple_rate and owner is -0.096, which is significant at 1%, indicating that the nature of state-owned controlling shareholders' equity can adjust the relationship between equity pledge and

investment structure. When the controlling shareholder is state-owned, it can alleviate the tendency to pledge equity to the company's financial investments and adjust the investment structure.

Table 5. Moderation effect of state-controlled shareholder.

Variables	(1)	(2)
	Instr	Instr
Ple_dum	1.552***	
	(3.623)	
Ownership_ple_dum	-3.519***	
	(-4.433)	
Ple_rate		0.053***
		(3.363)
Ownership_ple_rate		-0.096***
		(-3.564)
Ownership	-2.337***	-2.158***
	(-5.592)	(-4.976)
Size	-0.359**	-0.292**
	(-2.425)	(-1.990)
Lev	-18.069***	-18.068***
	(-13.510)	(-13.501)
Roa	0.944	0.909
	(0.272)	(0.262)
Cash	-3.914	-3.863
	(-1.033)	(-1.020)
Age	0.142***	0.129***
	(4.823)	(4.452)
_Cons	20.306***	19.053***
	(6.110)	(5.738)
N	14870	14870
R^2	0.062	0.063

Note: Table 5 shows the moderation effect of state-controlled shareholder. The values in brackets represent the t-statistics of the coefficients. ** stands for significant at 5% and *** stands for significant at 1%.

5. FURTHER ANALYSIS

5.1. Robustness Analysis

The propensity matching scoring method (Kryzanowski, Li, Xu, & Zhang, 2021) is used for the robustness test. This method matches the treatment and control groups to be more similar in some key covariates, thus reducing the selectivity bias. We adopt 1:2 nearest neighbor matching with return. Columns (1) and (2) in Table 6 show the coefficients of ple_dum and ple_rate to be positive and significant, indicating the benchmark regression results are robust.

Moreover, we test the robustness by adding control variables. M share represents management shareholding. Management shareholding refers to the situation in which the company's senior management team holds shares or equity. Management shareholding influences company investment with a governance role (Arthur, 2001; Filatotchev, Lien, & Piesse, 2005). Big4 refers to audits carried out by the four biggest accounting firms. The four major accounting firms have a supervisory role in corporate investment (Bae, Choi, Dhaliwal, & Lamoreaux, 2017). Therefore, we add these two variables to test the robustness of the baseline regression. Columns (3) and column (4) in Table 6 show the benchmark regression results are robust.

Table 6. Robustness analysis.

Variables	(1)	(2)	(3)	(4)
	Instr	Instr	Instr	Instr
Ple_dum	1.870***		1.751***	
	(3.986)		(3.878)	
Ple_rate		0.058***		0.059***
		(3.469)		(3.531)
Size	-0.452**	-0.337	-0.310**	-0.239
	(-2.157)	(-1.625)	(-1.982)	(-1.549)
Lev	-18.561***	-18.621***	-18.351***	-18.356***
	(-10.529)	(-10.553)	(-13.669)	(-13.667)
Roa	0.402	0.331	1.994	1.912
	(0.086)	(0.071)	(0.574)	(0.551)
Cash	-3.761	-3.503	-3.670	-3.569
	(-0.694)	(-0.646)	(-0.966)	(-0.939)
Age	0.161***	0.143***	0.099***	0.087***
	(3.877)	(3.488)	(3.242)	(2.886)
Mshare			-5.284***	-5.212***
			(-3.714)	(-3.685)
Big4			-1.872***	-1.961***
			(-3.734)	(-3.925)
_Cons	22.175***	20.021***	19.640***	18.298***
	(4.660)	(4.212)	(5.590)	(5.241)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	9022	9022	14870	14870
R^2	0.064	0.065	0.063	0.063

Note: Table 6 reflects the robustness analysis of baseline regression. * * stands for significant at 5% and *** stands for significant at 1%.

5.2. Industry Heterogeneity Analysis

Considering that there may be differences in the investment structure of companies depending on the nature of different industries, the sample is divided into manufacturing and non-manufacturing companies. Table 7shows the results of the grouped regression. The coefficient of non-manufacturing companies in the investment structure is significant. In non-manufacturing companies, the impact of the controlling shareholders' equity pledge on the company's investment structure is more biased towards financial investment than physical investment. Compared with manufacturing companies, non-manufacturing companies usually do not need large-scale capital investment for production equipment or production lines, so it is easier to use capital for financial investment to seek faster financial returns. In addition, manufacturing enterprises need to use fixed assets to obtain loans, so their bias toward financial investment is not so strong.

Table 7. Industry heterogeneity analysis.

Variables	(1)	(2)	(3)	(4)
	Manufacturing	Non-manufacturing	Manufacturing	Non-manufacturing
	Instr	Instr	Instr	Instr
Ple_dum	0.370	5.165***		
	(0.867)	(4.694)		
Ple_rate			0.013	0.163***
			(0.949)	(3.898)
Size	-0.250	-0.598**	-0.233	-0.471*
	(-1.432)	(-2.310)	(-1.346)	(-1.822)
Lev	-17.502***	-20.430***	-17.506***	-20.353***
	(-12.372)	(-7.211)	(-12.463)	(-7.133)
Roa	3.850	-4.614	3.827	-4.493
	(1.168)	(-0.586)	(1.162)	(-0.571)
Cash	-10.064***	6.165	-10.068***	6.855

Variables	(1)	(2)	(3)	(4)
	Manufacturing	Non-manufacturing	Manufacturing	Non-manufacturing
	Instr	Instr	Instr	Instr
	(-2.935)	(0.754)	(-2.937)	(0.833)
Age	0.179***	-0.004	0.176***	-0.035
	(5.007)	(-0.089)	(5.055)	(-0.707)
_Cons	15.486***	27.188***	15.141***	25.042***
	(4.361)	(4.893)	(4.272)	(4.507)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Bdiff	5.537***		0.173***	
N	9748	5122	9748	5122
R^2	0.038	0.084	0.038	0.085

Note: Table 7 reflects the heterogeneity of industry nature. * Stands for significant at 10%, * * stands for significant at 5% and *** stands for significant at 1%.

5.3. Audit Heterogeneity Analysis

Table 8 presents Big4 and non-big4 group regression results and the difference coefficient between groups. Non-Big Four companies' audit quality and external governance effects are weak (Che, Hope, & Langli, 2020). Therefore, for companies not audited by the Big Four accounting firms, the equity pledge of controlling shareholders has a more significant impact on the company's investment structure.

Table 8. Audit heterogeneity analysis.

Variables	(1)	(2)	(3)	(4)
	Big4	Non-big4	Big4	Non-big4
	Instr	Instr	Instr	Instr
Ple_dum	4.090*	1.720***		
	(1.649)	(3.729)		
Ple_rate			0.308	0.054***
			(1.469)	(3.333)
Size	-0.076	-0.370**	0.080	-0.299*
	(-0.256)	(-2.150)	(0.246)	(-1.757)
Lev	-7.615**	-18.660***	-7.543**	-18.664***
	(-2.384)	(-13.419)	(-2.361)	(-13.420)
Roa	17.052	1.065	20.310	0.953
	(1.170)	(0.299)	(1.603)	(0.267)
Cash	-11.569	-3.307	-12.914	-3.242
	(-0.799)	(-0.844)	(-0.962)	(-0.828)
Age	-0.064	0.141***	-0.078	0.128***
	(-1.004)	(4.553)	(-1.290)	(4.211)
_Cons	4.162	20.557***	0.565	19.230***
	(0.670)	(5.415)	(0.089)	(5.094)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Bdiff	-2.814*		-0.270***	
N	932	13938	932	13938
R^2	0.105	0.063	0.140	0.063

Note: Table 8 reflects the audit heterogeneity. * Stands for significant at 10%, * * stands for significant at 5% and *** stands for significant at 1%.

6. CONCLUSIONS

This paper studies the influence of the controlling shareholders' equity pledge on the company's investment structure. The empirical results show that the behavior of controlling shareholders' equity pledges significantly impacts the company's investment structure. Companies with controlling shareholders' equity pledges tend to invest in financial assets rather than physical investments. Compared with manufacturing and audits by Big4

companies, controlling shareholders' equity pledges on the company's investment structure is more significant in non-manufacturing and non-big4 companies.

This paper is important from a theoretical point of view because it confirms again, using the investment substitution theory, that investing in financial assets can crowd out investments in entities. This adds to theory of company investments. Secondly, from the perspective of the controlling shareholder's equity pledge, this paper studies the influencing factors of the company's investment structure, expands the research perspective on the influence of the investment structure, and enriches the academic literature affecting the company's investment structure. Finally, this paper studies the moderating effect of ownership nature, which provides more empirical evidence of ownership nature effects.

The practical significance lies in the fact that regulatory agencies formulate policies more specifically to prevent the risk of corporate financialization. Based on the findings of this study, the proportion of the equity pledge of controlling shareholders should be controlled, especially when the proportion of financial assets in the company's investment structure is too high. This measure can reduce the risk of financialization and maintain the stability of the financial market. In addition, it guides the controlling shareholders' equity pledge funds to flow to the company's entity investment, improves the company's innovation ability and production efficiency, and fundamentally enhances the company's long-term profitability.

The limitation of this paper lies in the measurement of investment structure, which is divided into two categories: financial assets and entity investment. This simplification may need to pay attention to the diversity of investment structures. The company's investment structure may include many types of assets and projects, such as equity investment, debt investment, fixed asset investment, and R&D investment. Simplifying it into only two categories may only partially reflect the actual investment structure of the company.

Funding: This research is supported by Deanship of Graduate Studies and Scientific Research-Najran University, Saudi Arabia (Grant number: NU/NRP/SHERC/12/20).
Institutional Review Board Statement: Not applicable.
Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
Data Availability Statement: Upon a reasonable request, the supporting data of this study can be provided by the corresponding author.
Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

REFERENCES

Abdul Bahri, E. N., Shaari Md Nor, A. H., Sarmidi, T., & Haji Mohd Nor, N. H. (2019). The role of financial development in the relationship between foreign direct investment and economic growth: A nonlinear approach. *Review of Pacific Basin Financial Markets and Policies*, *22*(2), 1950009. https://doi.org/10.1142/S0219091519500097

Akkemik, K. A., & Özen, Ş. (2014). Macroeconomic and institutional determinants of financialisation of non-financial firms: Case study of Turkey. *Socio-Economic Review*, *12*(1), 71–98. https://doi.org/10.1093/ser/mwt006

Arthur, N. (2001). Board composition as the outcome of an internal bargaining process: Empirical evidence. *Journal of Corporate Finance*, *7*(3), 307–340. https://doi.org/10.1016/S0929-1199(01)00024-4

Asongu, S. (2012). Are financial benefits of financial globalization questionable until greater domestic financial development has taken place? *African Governance and Development Institute WP/12/007*. https://doi.org/10.2139/ssrn.2493200

Bae, G. S., Choi, S. U., Dhaliwal, D. S., & Lamoreaux, P. T. (2017). Auditors and client investment efficiency. *The Accounting Review*, *92*(2), 19–40. https://doi.org/10.2308/accr-51530

Banerjee, C., Bose, N., & Rath, C. (2019). Explaining the effect of financial development on the quality of property rights. *Review of Development Economics*, *23*(2), 957–974. https://doi.org/10.1111/rode.12580

Cardella, L., Fairhurst, D., & Klasa, S. (2021). What determines the composition of a firm's cash reserves? *Journal of Corporate Finance, 68*, 101924. https://doi.org/10.1016/j.jcorpfin.2021.101924

Chauhan, Y., Mishra, A. K., & Spahr, R. W. (2021). Stock pledging and firm risk: Evidence from India. *Financial Management, 50*(1), 261–280. https://doi.org/10/grggds

Che, L., Hope, O.-K., & Langli, J. C. (2020). How big-4 firms improve audit quality. *Management Science, 66*(10), 4552–4572. https://doi.org/10.1287/mnsc.2019.3370

Chen, Y., Shen, B., Cao, Y., & Wang, S. (2024). CEO social capital, financing constraints and corporate financialisation: Evidence from Chinese listed companies. *Finance Research Letters, 60*, 104781. https://doi.org/10.1016/j.frl.2023.104781

DeJong, D. V., Liao, K., & Xie, D. (2020). Controlling shareholder's share pledging and accounting manipulations. *Available at SSRN 3274388*. https://doi.org/10/gjhkhp

Demir, F. (2009). Financial liberalization, private investment and portfolio choice: Financialization of real sectors in emerging markets. *Journal of Development Economics, 88*(2), 314–324. https://doi.org/10.1016/j.jdeveco.2008.04.002

Du, y. H. Z., Jun, D., & Jiali, H. (2018). Will controlling shareholders' share pledging help loss firms? Evidence from Chinese loss listed firms. *Journal of Shanghai University of Finance and Economics, 20*(6), 77–93. https://doi.org/10/gqsmzf

Duan, Q., Nor, N. M., & Selamat, A. I. (2023). Do controlling shareholders' equity pledges affect M&A investment? Evidence from listed companies in China. *Asian Economic and Financial Review, 13*(11), 773–788. https://doi.org/10.55493/5002.v13i11.4863

Duménil, G., & Lévy, D. (2004). *Capital resurgent: Roots of the neoliberal revolution*. Cambridge, MA: Harvard University Press.

Fabisik, K. (2019). Why do us ceos pledge their own company's stock? *Swiss Finance Institute Research Paper*, 19-60. https://doi.org/10/grggd2

Filatotchev, I., Lien, Y.-C., & Piesse, J. (2005). Corporate governance and performance in publicly listed, family-controlled firms: Evidence from Taiwan. *Asia Pacific Journal of Management, 22*(3), 257–283. https://doi.org/10.1007/s10490-005-3569-2

Guo, A., Wei, H., Zhong, F., Liu, S., & Huang, C. (2020). Enterprise sustainability: Economic policy uncertainty, enterprise investment, and profitability. *Sustainability, 12*(9), 3735. https://doi.org/10/grggdh

Guo, Q., Kryzanowski, L., Li, M., & Zhang, J. (2021). Share-loan pledging and relaxation of share-repurchase restrictions in China. *Accounting & Finance, 61*(5), 5925–5964. https://doi.org/10/gn7xxs

Hala, Y., Abdullah, M. W., Andayani, W., Ilyas, G. B., & Akob, M. (2020). The financial behavior of investment decision making between real and financial assets sectors. *The Journal of Asian Finance, Economics and Business, 7*(12), 635–645. https://doi.org/10.13106/JAFEB.2020.VOL7.NO12.635

Hou, X., & Zheng, T. (2021). Financialization, financial incentives and corporate investment structure. *Journal of Audit & Economics, 36*(3), 117-127. http://dx.doi.org/doi:10.3969/j.issn.1004-4833.2021.03.012

Hu, W., Teng, S., Lin, Y.-E., & Li, Y. (2023). Share pledging, social trust and cash dividend payout: Evidence from China. *Applied Economics Letters, 30*(21), 3006-3012. https://doi.org/10/gq3n9d

Huang, J., Luo, Y., & Peng, Y. (2021). Corporate financial asset holdings under economic policy uncertainty: Precautionary saving or speculating? *International Review of Economics & Finance, 76*, 1359–1378. https://doi.org/10.1016/j.iref.2019.11.018

Huang, Z., Li, X., & Zhao, Y. (2022). Stock pledge restrictions and investment efficiency. *Finance Research Letters, 48*, 102864. https://doi.org/10/gqbzt2

Hwang, A., Qiao, Y., & Ku, C. (2016). Pledge or not pledge? Shares owned by insiders pledged for collateral. *International Journal of Management Theory and Practices, 17*(1), 36-55.

Jiang, F., Shen, Y., & Cai, X. (2022). Can multiple blockholders restrain corporate financialization? *Pacific-Basin Finance Journal, 75*, 101827. https://doi.org/10.1016/j.pacfin.2022.101827

Jin, X. M., Mai, Y., & Cheung, A. W. K. (2022). Corporate financialization and fixed investment rate: Evidence from China. *Finance Research Letters, 48*, 102898. https://doi.org/10.1016/j.frl.2022.102898

Kaplan, C., Özmen, E., & Yalç, C. (2006). *The determinants and implications of financial asset holdings of non-financial firms in Turkey: An empirical investigation*. Research and Monetary Policy Department, Central Bank of the Republic of Turkey, No. 0606.

Kim, H., & Kung, H. (2017). The asset redeployability channel: How uncertainty affects corporate investment. *The Review of Financial Studies*, *30*(1), 245–280. https://doi.org/10.1093/rfs/hhv076

Kryzanowski, L., Li, M., Xu, S., & Zhang, J. (2021). Share pledging and corporate securities fraud. *Available at SSRN 3987430*, 3987430. https://doi.org/10.2139/ssrn.3987430

Li, W., Huang, J., Shi, C., & Yang, X. (2022). Does share pledging promote or impede corporate social responsibility? An examination of Chinese listed firms. *Economic Research*, *35*(1), 175–195. https://doi.org/10/gqmh5m

Li, X., & Li, Q. (2022). Does margin call pressure affect the M & A decision of controlling shareholders with equity pledges: Evidence from Chinese listed company. *Frontiers in Psychology*, *13*, 898118. https://doi.org/10/gqstzw

Lin, K. J., Lu, X., Zhang, J., & Zheng, Y. (2020). State-owned enterprises in China: A review of 40 years of research and practice. *China Journal of Accounting Research*, *13*(1), 31–55. https://doi.org/10.1016/j.cjar.2019.12.001

Ma, S., Shen, J., Wang, F., & Wu, W. (2022). A tale of two us: Corporate leverage and financial asset allocation in China. *International Review of Financial Analysis*, *83*, 102260. https://doi.org/10.1016/j.irfa.2022.102260

Malmendier, U., & Tate, G. (2005). CEO overconfidence and corporate investment. *The Journal of Finance*, *60*(6), 2661–2700. https://doi.org/10.1111/j.1540-6261.2005.00813.x

Mu, W., Zhou, Y., & Cao, Q. (2020). Internal control quality, equity pledge financing and investment efficiency. *Journal of Physics: Conference Series*, *1629*(1), 012081. https://doi.org/10/gqjcxb

Ni, Z., Fang, L., Liu, H., & Lu, X. (2022). Performance and risk of energy industrial firms with stock pledge in China. *Finance Research Letters*, *46*, 102410. https://doi.org/10/gqfjjs

Orhangazi, Ö. (2008). Financialisation and capital accumulation in the non-financial corporate sector: A theoretical and empirical investigation on the US economy: 1973–2003. *Cambridge Journal of Economics*, *32*(6), 863-886. https://doi.org/10.1093/cje/ben009

Seo, H. J., Kim, H. S., & Kim, Y. C. (2012). Financialization and the slowdown in Korean firms' R&D investment. *Asian Economic Papers*, *11*(3), 35-49. https://doi.org/10.1162/ASEP_a_00160

Shin, H.-Y. (2012). Financialization and stagnant corporate investment in Korea since the Asian financial crisis. *Available at SSRN 2156502*.

Tian, Z., Tang, R., Liu, W., & Qi, Y. (2024). Controlling shareholder's equity pledge and corporate financialization. *Finance Research Letters*, *60*, 104922. https://doi.org/10.1016/j.frl.2023.104922

Tihanyi, L., Aguilera, R. V., Heugens, P., Van Essen, M., Sauerwald, S., Duran, P., & Turturea, R. (2019). State ownership and political connections. *Journal of Management*, *45*(6), 2293-2321. https://doi.org/10.1177/0149206318822113

Tori, D., & Onaran, O. (2017). The effects of financialisation and financial development on investment: Evidence from firm-level data in Europe. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3064062

Wang, A. T., & Chen, A. (2020). The causes and consequences of stock pledging by controlling shareholders: The case of Taiwan. In C. Few Lee & M.-T. Yu (Eds.), Advances in pacific basin business, economics and finance. In (Vol. 8, pp. 99–129): Emerald Publishing Limited. https://doi.org/10.1108/S2514-465020200000008005.

Wang, Q., Qiu, M., & Tan, W. (2020). Does insiders share pledging stifle innovation? Evidence from China. *International Review of Financial Analysis*, *72*, 101570. https://doi.org/10/gqmh5h

Wu, S., & Wu, Y. (2020). *The impact of financialization on profitability of real estate enterprises*. Paper presented at the In 1st Africa-Asia Dialogue Network (AADN) International Conference (AADNIC 2019), Atlantis Press.

Xiao, H., Chen, X., Fang, H., & Zhang, Y. (2021). Insider share pledging and firm value consequences under the COVID-19: Evidence from China. *Applied Economics*, *53*(56), 6522-6534. https://doi.org/10/gqmh5k

Xie, Y., Wang, T., Zhang, J., & Wang, N. (2023). Does controlling shareholders' share pledge exacerbate excessive financialization of enterprises?—Evidence from performance pressure perspective. *PloS One*, *18*(7), e0288705. https://doi.org/10.1371/journal.pone.0288705

Xu, X., Mu, Y., & Wang, J. (2023). Corporate risk and financial asset holdings. *Pacific-Basin Finance Journal*, *81*, 102121. https://doi.org/10.1016/j.pacfin.2023.102121

Yin, H., & Zhang, R. (2019). The nature of controlling shareholders, political background and corporate anti-corruption practice disclosure. *The Journal of Asian Finance, Economics and Business*, *6*(1), 47-58. https://doi.org/10.13106/jafeb.2019.vol6.no1.47

Zhang, C., Zhou, B., & Tian, X. (2022). Political connections and green innovation: The role of a corporate entrepreneurship strategy in state-owned enterprises. *Journal of Business Research*, *146*, 375-384. https://doi.org/10.1016/j.jbusres.2022.03.084

Zhang, R., Wu, F., Feng, J., & Chen, Y. (2022). Research on the influence of financial investment of listed non-financial companies on industrial investment. *Frontiers in Economics and Management*, *3*(11), 103-108. https://doi.org/10.6981/FEM.202211_3(11).0013

Zhang, Y., & Wang, L. (2016). Tax incentives,deviations of investment structure and firm value. *Finance and Trade Research*, *27*(05), 136-146.

Zhou, Y., Du, Y., Lei, F., Su, Z., Feng, Y., & Li, J. (2021). Influence of financialization of heavily polluting enterprises on technological innovation under the background of environmental pollution control. *International Journal of Environmental Research and Public Health*, *18*(24), 13330. https://doi.org/10.3390/ijerph182413330

Zhu, B., Xia, X., & Zheng, X. (2021). One way out of the share pledging quagmire: Evidence from mergers and acquisitions. *Journal of Corporate Finance*, *71*, 102120. https://doi.org/10/gqmh5p

Zulfikar, R., & STp, M. (2018). Estimation model and selection method of panel data regression: An overview of common effect, fixed effect, and random effect model. *JEMA: Scientific Journal in the Field of Accounting*, 1-10. https://doi.org/10.31227/osf.io/9qe2b