

Financial Asset and Long-term Investment of China's Listed Firms

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Abstract

Using panel data of China's A-share listed companies from 2010 to 2023, this article empirically tests the impact of financial assets on corporate long-term investment through system GMM method. In order to deal with endogeneity issues, this article conducted robustness tests using propensity score matching method. It's found that corporate financialization inhibits long-term investment. The results remained unchanged after excluding observations during the 2008 financial crisis and the COVID-19 epidemic. Heterogeneity analysis shows that the impact of financialization on corporate long-term investment is greater among private firms, manufacturing firms and smaller firms.

Keywords

Financial Assets; Long-term Investment; Crowding out Effect; System GMM; Propensity Score Matching.

1. Introduction

Long term investment and financial assets are of great significance to the survival and development of non-financial firms. The report of the 20th National Congress of the Communist Party of China pointed out that we must "adhere to placing the focus of economic development on the real economy". In this article, the term long-term investment is used to describe the corporate investments in fixed assets, intangible assets and other long-term non-financial assets. This type of investment lays the foundation for firms to sell goods and provide services. Also, capital formation and corporate value growth are achieved with long-term investment. Thus, corporate long-term investment is crucial for the development of the real economy. Meanwhile, non-financial firms often hold a certain amount of financial assets for profit motives or precautionary savings purposes. In daily business activities, firms also hold financial assets as a result of market risk hedging, funds lending, or other purposes.

According to Orhangazi (2008), corporate financialization refers to the increase in the proportion of financial assets in the total assets of non-financial firms, as well as the increase in dependence on financial activities relative to production, trade, and other business activities[1]. In this definition, the phenomenon where firms hold financial assets in their balance sheet can be seen as a type of "financialization". During the past several decades, corporate financialization has become a widespread trend in major economies such as China and the United States. The interaction between the real economy and the financial market can have deep implications for firms, especially regarding their profitability and ability to innovate. As a result, the internal mechanisms of the entire economy can be affected by financialization of individual firms (Xu et al., 2021)[2]. Studying the relationship between corporate financial assets and long-term investments gives further insights into the impact that the financial market has on China's real economy.

2. Literature Review

At present, there are two main perspectives on the topic of how corporate financial asset positions affect long-term investment. One viewpoint suggests that the impact of financial asset positions on non-financial firms' main business investments can be concluded as a "crowding out" effect. Theoretically, under limited financial constraints, an increase in financial asset positions inevitably reduces non-financial investment. If the rate of return of financial assets is higher than that of non-financial assets, the rational action for a firm to take is to transfer funds from non-financial assets to financial assets. Another viewpoint suggests that financial assets held by physical firms will have a "reservoir" effect on their main business investments. The theoretical basis is that the high rate of return and high liquidity of financial assets can help non-financial firms improve their operating performance, cash flow, as well as increase the accumulated funds available for long-term investment.

2.1. Crowding out Effect

Based on firm-level data of U.S. companies, Orhangazi (2008) discovered two mechanisms that help explain the negative relationship between corporate financialization and physical asset investment[1]. On the one hand, under the incentive mechanism that links to corporate performance, the profit opportunities in the financial market motivate the corporate management to shift funds from physical asset investments to financial asset investments. On the other hand, financial asset investment activities occupy internal funds of firms and increase the uncertainty faced by the firm, thereby hindering physical asset investment. Zhang et al. (2016) confirmed the positive effect of profits obtained from the financial channel on corporate cash flow, but still pointed out that the higher the risk-adjusted return of financial assets, the lower the willingness of firms to invest in fixed assets, that is, the total effect of financialization on capital expenditure of Chinese firms is negative[3]. Du et al. (2017) found that the increase in the proportion of financial assets held by firms harms their innovation abilities and physical capital investment, which in turn damages the future performance of the firms' major business[4]. Qi et al. (2018) found similar connections[5]. Leng et al. (2023) found that firms' speculation in the financial market suppresses their investment in physical long-term capital[6]. Research based on Chinese data shows that there is a negative relationship between the financialization of listed companies and their investment ratio of operating assets (Meng et al., 2022)[7]. Moreover, in state-owned firms, this negative relationship is more pronounced than in non-state-owned firms. Tao et al. (2021) focused on the impact of financialization on corporate environmental investment[8]. Tao et al. (2021) found that holding financial assets suppresses corporate environmental investments, and this effect is more pronounced among private and small businesses[8].

2.2. Reservoir effect

Some scholars find that the return generated by financial assets not only increases the internal financing funds for firms, but also beautifies their financial statements, increases their external financing capabilities, and thus alleviates their financing constraints (Theurillat et al., 2010)[9]. Hu et al. (2017) discovered that the main purpose of firms investing in financial assets is to increase precautionary reserves[10]. Kliman et al. (2015) found that during the decline in the U.S. industrial investment rate, U.S. non-financial firms did not increase the proportion of profits used for financial asset investment[11]. The decline in the investment rate of productive assets in U.S. firms is mainly caused by the decrease in corporate profit margins, and should not be attributed to the financialization of non-financial firms.

2.3. Comments on the Literature

Existing literature has studied the impact of financialization on corporate investment from the perspectives of agency problems, risk-adjusted returns, and financing constraints. However, there is no consensus in existing literature on how corporate financial asset positions affect long-term investments. It is worth noting that the crowding-out effect and the reservoir effect are not completely mutually exclusive. In the real world, the investment decisions of firms are resulted from the two effects combined. The problem of how corporate financial asset positions affects long-term investment still requires further research.

3. Empirical Design

3.1. Data and Variables

This article uses firm-level data obtained from the CSMAR Database covering China's A-share listed companies. The time span of the data used in this article ranges from 2010 to 2023. The beginning year is set at 2010 in order to fully make use of the existing data, while alleviating the impact of the 2008 financial crisis on estimation results. During the 2008 financial crises, the prices of financial assets such as stocks experienced significant fluctuations, and firms' financial asset investment may be affected by period-specific motivations or concerns. Therefore, this article does not include observations from this period. The ending year of the data used in empirical research is set at 2023, since the last comprehensive update of the data required for this article ends at 2023.

Following the approach of Du et al. (2017), this article excluded observations of firms in the real estate sector and the financial sector. The definition of real estate and financial sectors follow the "National Economic Classification of Industries" (GB/T 4754-2011) (https://www.stats.gov.cn/sj/tjbz/gjtjbz/202302/t20230213_1902749.html). Besides, observations of delisted firms and those under special treatments are excluded. After excluding these samples, the total number of observations involved in the empirical study is 31676.

The dependent variable of this article is the ratio of firm's annual long-term investment expenditure to its total assets. Following Meng et al. (2022), Zhang et al. (2016), Jin et al. (2012), this article uses the difference between "cash paid for the purchase and construction of fixed assets, intangible assets, and other long-term assets" and "cash received from the disposal of fixed assets, intangible assets, and other long-term assets" to represent the long-term investment expenditure of a firm in an accounting year[7][3][12]. To ensure comparability of long-term investment expenditures across firms of different sizes, long-term investment expenditure is divided by total asset of the firm, and the resulting ratio is used as the dependent variable. In the following text, the dependent variable will be referred to as the long-term investment expenditure ratio.

The main explanatory variable of this article is the proportion of financial asset to the total asset of a firm. Following Du et al. (2017) and Xu et al. (2021), this article defines a company's financial assets as the sum of trading financial assets, derivative financial assets, available for sale financial assets, and hold to maturity investments. The value of all these four asset items are obtained from firms' balance sheet[4][2]. The main explanatory variable of this article can be obtained by adding the book value of the four types of financial assets mentioned above and then dividing the sum by the total asset of the firm. In the following text, this main explanatory variable is referred to as the financial asset ratio. In addition, in some literature, investment property can also be considered as a type of financial asset. This article will discuss it in the robustness test section of the article. However, this article does not consider cash as a type of financial asset because the main business activities of firms themselves can also generate cash. The amount of cash held by a firm cannot accurately reflect its investment positions in the financial sector.

This article also controls for a series of financial indicators that may affect corporate investment decisions. Among them, total asset is used to measure the size of the firm. Operating income and operating costs are used to measure a company's operating conditions. Proportion of shares held by the top 10 shareholders is used to measure the equity structure and governance conditions of a firm. The Q value is used to measure a firm's potential of future growth. The asset liability ratio is used to measure a firm's capital structure. The age of a firm is used to measure its operational stability and innovation capability.

Table 1 presents the descriptive statistics of all the variables mentioned above.

Table 1. Descriptive Statistics

Variable Name	Explanation	Unit	Mean	Standard Deviation	Minimum	Maximum
LONGINV	long-term investment expenditure ratio	%	4.834	5.087	-66.724	64.183
FINAN	the financial asset ratio	%	2.935	7.117	0.000	85.877
control variable						
asset	Total Asset	Ten billion yuan, natural logarithm	3.736	1.299	-2.843	10.216
income	Operating Income/Total Asset	%	64.796	52.135	0.095	1141.558
cost	Operating Cost/Total Asset	%	60.726	51.982	0.896	1165.422
concen	Proportion of Shares Held by the Top 10 Shareholders	%	54.092	15.527	7.807	99.230
Q	Total Market Value/Book Value of Total Equity	ratio	3.862	17.321	0.048	2788.704
lev	Total Debt/Total Asset	%	42.194	19.921	0.708	99.760
foage	Age of Firm (since the year of founding)	Years, natural logarithm	2.838	0.377	0.000	4.234

4. Empirical Model Design

The changes in corporate investment may have inertia. That is, future investment is influenced by past investment. Using panel data, the dynamic behavior of firms can be statistically modeled. In terms of empirical model design, this article estimates a dynamic panel model that incorporates the lagged term of the dependent variable as an explanatory variable, so as to characterize the inertia of changes in the long-term investment expenditure ratio of firms. It is worth noting that the lag term of the dependent variable may be correlated with the lag period error term, causing endogeneity issues and leading to inconsistencies in traditional within group estimates. In order to alleviate the endogeneity problem, this article adopts the two-step system generalized moment (GMM) method to estimate the dynamic panel model. By selecting instrumental variables, the GMM method deals with endogeneity issues caused by lagged terms of the dependent variable and other explanatory variables being correlated with the error term. This article uses robust standard errors for the two-step system GMM when conducting all

estimations. This robust standard error allows for the presence of heteroscedasticity in the error term and has been corrected for the two-step GMM to avoid the problem of severe underestimation of GMM standard error (Windmeijer, 2004)[13]. The baseline model studied in this article is shown in equation (1).

$$\text{LONGINV}_{i,t} = \alpha + \beta_1 \text{LONGINV}_{i,t-1} + \beta_2 \text{FINAN}_{i,t-1} + \beta_X * X_{i,t-1} + u_i + \lambda_t + \epsilon_{it} \quad (1)$$

In equation (1), α , β are parameters to be estimated; i represents individual firms; t represents years; $\text{LONGINV}_{i,t}$ is the explained variable “the long-term investment expenditure ratio”; $\text{FINAN}_{i,t-1}$ is the main explanatory variable “the financial asset ratio”; $X_{i,t-1}$ is the matrix of controlled variables; u_i represents unobservable individual effects, λ_t represents year fixed effects; ϵ_{it} represents the error term.

The system GMM estimation method requires the selection of two set of instrumental variables, one for the levels equation and the other for the first differences equation. In the following estimation, the former set of instrumental variables includes lagged first-order differences of the dependent variable and the main explanatory variable, while other variables serve as instrumental variables for themselves in the levels equation. The latter set of instrumental variables includes the second and third order lag terms of the dependent variable and the second and third order lag terms of the main explanatory variable, while other variables use their own first-order differences as instrumental variables.

In order to deal with the endogeneity problem caused by self selection, this paper uses propensity score matching (PSM) to test the reliability of GMM results in the robustness test section. In order to verify the correctness of the variable design and baseline results, this article also conducts robustness tests by replacing key variables. The alternative variable used to replace the explained variable is the proportion of cash paid for the purchase and construction of fixed assets, intangible assets, and other long-term assets to the total asset of the firm. The alternative variable used to replace the main explanatory variable is constructed by adding the book value of investment property to the total book value of the four types of financial assets mentioned above, and then dividing the sum by the total asset of the firm.

5. Empirical Research

5.1. Baseline Regression

The first to third columns of Table 2 present the estimated coefficients of the financial asset ratio under different control variable combinations. It can be seen that regardless of whether control variables are added or year fixed effects are controlled, the estimated coefficients of financial asset ratio are negative and statistically significant at least at the 10% level. This indicates that holding financial assets has a crowding out effect on long-term investment expenditures of firms.

During the COVID-19 epidemic in 2020, financial assets like stocks experienced significant fluctuations in prices. During the epidemic, the asset allocation decisions of firms may have certain peculiarities. Mixing observations from 2020 and beyond in regression with previous observations may lead to biased estimates of coefficients. To address this concern, this section presents the estimated results excluding observations from 2020 and beyond, and the corresponding regression results are presented in the fourth column of Table 2. It can be seen that for sub sample of 2019 and earlier, the estimated coefficient of the variable “financial asset ratio” is significant at the 5% level. The value of the estimated coefficient reaches -0.024, which implies a greater crowding out effect than the corresponding -0.01 in the entire sample. It can be found that the crowding out effect of financial assets was stronger before the epidemic.

It is worth noting that the COVID-19 epidemic itself provides a new opportunity to study the relationship between corporate financial asset positions and long-term investment expenditures. Therefore, this section also make use of the observations from 2020 and beyond, and conducts regression based on this sub sample. The corresponding regression results are presented in column 5 of Table 2. In this sub sample, the estimated coefficient of financial asset ratio is not statistically significant at the 10% level. The possible reason is that during the epidemic, financial assets actually played a certain "reservoir" effect. This effect cancels out the crowding out effect and leads to a situation where there is no significant statistical relationship between the financial asset ratio and the long-term investment expenditure ratio.

The premise of applying the system GMM method is that there is no second-order autocorrelation in the difference of the error term. Table 2 reports the p-values of the AR statistic that tests for second-order autocorrelation in the difference of the error term. Except for the first column where none of the control variables are included, the AR statistics in the other columns did not reject the null hypothesis of "coefficient of autocorrelation equals 0" at the 10% significance level. Therefore, it can be concluded that there is no second-order autocorrelation in the difference of the error term. Therefore, the estimation in this section meets the prerequisite for using the system GMM method.

Table 2. Baseline Regression

	(1) Full Sample (LONGINV)	(2) Full Sample (LONGINV)	(3) Full Sample (LONGINV)	(4) 2019 and Earlier (LONGINV)	(5) 2020 and Beyond (LONGINV)
L.LONGINV	0.543*** (31.930)	0.474*** (26.722)	0.462*** (28.700)	0.463*** (23.925)	0.465*** (17.209)
L.FINAN	-0.013* (-1.895)	-0.025*** (-3.681)	-0.010* (-1.647)	-0.024*** (-2.844)	-0.003 (-0.319)
L.asset		-0.014 (-0.406)	0.004 (0.113)	0.048 (1.192)	0.000 (0.008)
L.income		0.071*** (6.975)	0.064*** (7.165)	0.058*** (5.689)	0.063*** (6.095)
L.cost		-0.071*** (-6.673)	-0.064*** (-6.845)	-0.058*** (-5.497)	-0.063*** (-5.860)
L.lev		-0.013*** (-4.950)	-0.015*** (-6.003)	-0.017*** (-5.514)	-0.016*** (-4.277)
L.Q		0.002 (0.916)	0.002 (0.858)	0.001 (1.151)	0.040 (1.262)
L.concen		0.009*** (4.127)	0.010*** (4.532)	0.011*** (4.357)	0.007*** (2.579)
L.foage		-0.637*** (-6.578)	-0.582*** (-5.354)	-0.328*** (-2.629)	-0.995*** (-6.401)
Constant	2.080*** (23.082)	4.075*** (12.120)	4.230*** (11.069)	3.141*** (7.523)	5.003*** (8.625)
Year Fixed Effect	No	No	Yes	Yes	Yes
Obs	31676	31676	31676	19186	12490
AR2 (p value)	0.040	0.141	0.161	0.100	0.938

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.2. Analysis of Investment Structure

The current level of financial asset positions of firms may be influenced by the level of past financial asset positions. By using the financial asset ratio as the dependent variable, the GMM method can be used to study the effects of financial asset positions on itself. From Table 3, it can be clearly seen that the estimated coefficient of the financial asset ratio is positive and significant at the 1% level in three different time intervals: the entire sample, before the epidemic, and during the epidemic. This indicates that firms with a higher degree of financialization in the previous period will also have a higher degree of financialization in the next period, indicating a clear inertia in their holding of financial assets. However, this inertia does not imply that firm's financial asset positions have a self reinforcing effect. Even if the financial asset ratio of all firms decrease in the next period, when firms with high initial holding level of financial assets still have higher financial asset ratio than firms with low initial holding level of financial assets, the estimated coefficient of the main explanatory variable may still be statistically significant and positive. In fact, according to sample data, the average financial asset ratio of Chinese firms has shown an overall upward trend from 2010 to 2023. It has increased from 1.15% in 2010 to 4.84% in 2023. This indicates that Chinese listed companies are financializing at a fast pace. In contrast, the average fixed asset ratio of Chinese listed companies has decreased from 23.69% in 2010 to 20.00% in 2023 and the average intangible asset ratio has decreased from 4.56% in 2010 to 4.52% in 2023. Here, fixed asset ratio represents the proportion of fixed assets to total asset of a firm. Intangible asset ratio is defined in the same manner.

Table 3. Inertia in the Financial Asset Ratio

	(1) Full Sample (FINAN)	(2) 2019 and Earlier (FINAN)	(3) 2020 and Beyond (FINAN)
L.LONGINV	-0.022*** (-3.683)	-0.011* (-1.787)	-0.034 (-1.557)
L.FINAN	0.695*** (26.083)	0.731*** (17.483)	0.592*** (13.446)
L.asset	-0.042* (-1.733)	0.044 (1.578)	-0.184*** (-4.056)
L.income	0.016* (1.811)	0.006 (0.596)	0.020* (1.790)
L.cost	-0.017* (-1.897)	-0.006 (-0.608)	-0.022** (-1.984)
L.lev	-0.017*** (-6.832)	-0.014*** (-6.793)	-0.041*** (-5.767)
L.Q	0.001 (1.189)	0.001 (1.189)	0.025** (2.170)
L.concen	0.004** (1.995)	0.000 (0.230)	0.015*** (3.598)
L.foage	0.027 (0.335)	0.084 (1.119)	-0.364* (-1.683)
Constant	1.724*** (5.255)	1.009*** (4.308)	4.445*** (5.303)
Year Fixed Effect	Yes	Yes	Yes
Obs	30876	18654	12222
AR2 (p value)	0.006	0.004	0.136

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Long-term investment expenditures of firms can promote the formation of fixed assets, intangible assets, and other long-term assets. Considering the crowding out effect of financial asset ratio on long-term investment expenditures and its inertia in maintaining its own level, this section examines how financial asset ratio affects corporate asset structure. To this end, three proxy variables are constructed to measure the asset structure of firms. Proxy variables 1, 2, and 3 are the ratio of fixed assets to total corporate asset, the ratio of intangible assets to total corporate asset, and the ratio of the sum of both fixed assets and intangible assets to total corporate asset, respectively. The corresponding regression results are shown in Table 4. It's found that for the 3 asset structure measurements, the regression coefficients of financial asset ratio are not significant at the 10% level, and their signs vary. This indicates that the current level of the firm's financial asset ratio does not significantly change the proportion of financial assets to fixed assets and intangible assets in the next period. From this estimation result, it can be inferred that although financial assets have a crowding out effect on a firm's annual incremental long-term investment expenditures, their relative size is not yet large enough to significantly change the book value structure of the firm's existing assets.

Table 4. Investment Structure

	(1) Proxy 1	(2) Proxy 2	(3) Proxy 3
L.LONGINV	0.016 (0.381)	0.058 (0.103)	0.020 (1.031)
L.FINAN	0.513 (1.396)	-1.092 (-0.823)	0.837 (1.334)
L.Proxy1	0.317*** (2.721)		
L.Proxy2		0.637*** (26.793)	
L.Proxy3			0.538* (1.878)
L.asset	0.086 (0.478)	0.267 (0.149)	-0.040 (-0.302)
L.income	-0.163 (-0.665)	-0.297 (-1.578)	-0.075 (-1.109)
L.cost	0.169 (0.651)	0.271 (1.332)	0.077 (1.073)
L.lev	0.002 (0.087)	-0.094 (-0.679)	0.040 (0.914)
L.Q	0.001 (0.074)	0.192 (0.227)	-0.001 (-0.340)
L.concen	0.004 (0.259)	-0.076 (-0.670)	0.004 (0.529)
L.foage	-0.053 (-0.260)	4.799 (0.823)	0.003 (0.009)
Constant	-1.757 (-0.712)	-0.371 (-0.021)	-4.301 (-1.242)
Year Fixed Effect	Yes	Yes	Yes
Obs	30874	30620	30823
AR2 (p value)	0.345	0.243	0.481

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.3. Heterogeneity Analysis

5.3.1. Controller Type

State-owned firms, private firms, and foreign firms are three important components of the Chinese economy. Due to their different roles in economic activities, the factors they consider in making investment decisions can also be different. This section divides firms in the full sample into state-owned firms, private firms, and foreign firms based on the nature of the ultimate actual controller of each individual firm, and conducts regression analysis separately. The regression results are shown in Table 5. For state-owned firms and foreign firms, the estimated coefficients of the financial asset holding rate variable are not significant, while for private firms, the estimated coefficients of the financial asset ratio are significant at the 10% level. This indicates that corporate financialization mainly crowds out long-term investment expenditures of private firms. Compared to private firms, state-owned firms need to bear more social responsibility. The investment behavior of state-owned firms may be affected more by social needs and is thus less sensitive to the holding level of financial assets. State owned firms' profit motive for holding financial assets may also be lower than that of private firms. The investment activities of foreign firms may be related to the goals and financial constraints of the entire multinational enterprise, and are thus less affected by the financial assets held by the entities registered in China, which are included in the group of foreign firms in this section. However, due to the fact that there are relatively few firms listed China's stock market whose ultimate controllers are foreign investors, the estimated results for foreign firms may not be sufficiently representative.

Table 5. Controller Type Heterogeneity

	(1) State Owned Firms (LONGINV)	(2) Private Firms (LONGINV)	(3) Foreign Firms (LONGINV)
L.LONGINV	0.490*** (20.454)	0.459*** (22.889)	0.383*** (6.058)
L.FINAN	-0.012 (-1.154)	-0.017* (-1.802)	-0.010 (-0.763)
L.asset	0.100** (2.183)	0.053 (0.907)	0.035 (0.198)
L.income	0.055*** (4.759)	0.064*** (5.663)	0.068*** (4.179)
L.cost	-0.057*** (-4.795)	-0.061*** (-5.081)	-0.070*** (-4.271)
L.lev	-0.011*** (-3.354)	-0.019*** (-5.517)	-0.007 (-0.621)
L.Q	0.004 (1.302)	0.011 (1.081)	-0.000 (-0.403)
L.concen	0.005 (1.516)	0.012*** (3.814)	0.001 (0.081)
L.foage	-0.134 (-0.866)	-0.614*** (-4.111)	-0.731 (-1.323)
Constant	1.901*** (3.433)	4.062*** (7.479)	5.503*** (2.848)
Year Fixed Effect	Yes	Yes	Yes
Obs	11908	17559	1580
AR2 (p value)	0.767	0.142	0.118

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

5.3.2. Industry Heterogeneity

Firms in different industries have different investment strategies and asset structures. Therefore, the impact of financial assets on their long-term investment expenditures may also be different. As a result, it is necessary to conduct heterogeneity analysis based on different industries. This section classifies the samples according to the industry each company belongs to. The industry classification standards are based on the "National Economic Classification of Industries" (GB/T 4754-2011)

(https://www.stats.gov.cn/sj/tjbz/gjtjbz/202302/t20230213_1902749.html).

The results of industry heterogeneity analysis are shown in Table 6. For the primary and tertiary industries, the financial asset ratio does not significantly affect long-term investment expenditures of firms. However, for the secondary industry, the estimated coefficient of the variable "financial asset ratio" is statistically significant at the 1% level, confirming the crowding out effect. Considering the importance of the manufacturing sector, which belongs to the secondary industry, to the real economy and the entire national economy, this section separately examines the impact of financial asset positions of manufacturing firms on their long-term investment expenditures. The results indicate that the financial asset ratio has a significant negative impact on the long-term investment expenditures of manufacturing firms. This is consistent with the regression based on the entire sample of the secondary industry. It can be seen that the negative impact of corporate financialization is mainly concentrated in the real economy sector.

Table 6. Industry Heterogeneity

	(1) Primary Industry (LONGINV)	(2) Secondary Industry (LONGINV)	(3) Manufacturing Sector (LONGINV)	(4) Tertiary Industry (LONGINV)
L.LONGINV	0.453*** (4.216)	0.464*** (27.199)	0.462*** (25.372)	0.438*** (13.590)
L.FINAN	0.161 (1.003)	-0.020*** (-2.620)	-0.025*** (-3.255)	-0.005 (-0.518)
L.asset	0.795 (1.448)	-0.022 (-0.571)	-0.077* (-1.673)	0.061 (0.969)
L.income	0.082** (2.025)	0.074*** (6.174)	0.077*** (5.703)	0.029*** (3.039)
L.cost	-0.067 (-1.602)	-0.073*** (-5.676)	-0.075*** (-5.170)	-0.031*** (-3.193)
L.lev	-0.052** (-2.332)	-0.015*** (-4.576)	-0.015*** (-4.076)	-0.010*** (-2.590)
L.Q	0.290*** (3.732)	0.005 (1.072)	0.002 (0.544)	0.001 (0.455)
L.concen	0.016 (0.334)	0.008*** (3.356)	0.008*** (2.828)	0.012*** (2.757)
L.foage	-3.594 (-1.101)	-0.721*** (-5.878)	-0.874*** (-6.308)	-0.265 (-1.306)
Constant	9.929 (0.975)	4.972*** (11.232)	5.711*** (11.665)	2.193*** (3.142)
Year Fixed Effect	Yes	Yes	Yes	Yes
Obs	417	23672	21065	7587
AR2 (p value)	0.199	0.883	0.744	0.023

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

5.3.3. Size Heterogeneity

This section classifies firms based on their asset size. The first column of Table 7 reports the regression results of large firms whose assets lies in the top 25% of all sample firms. The second column reports the regression results of medium-sized firms with assets ranging from 25% to 75% of all sample firms. It's found that for large and medium-sized firms, the financial asset ratio does not affect the long-term investment expenditure ratio of the firm in the future. The third column reports the regression results of small firms in the bottom 25% of asset size. Unlike large and medium-sized firms, for small firms, financial assets have a significant inhibitory effect on long-term investment expenditures. The possible reason is that small businesses have limited internal funding and weaker external financing capabilities compared to large and medium-sized firms. When more resources are invested in financial assets, the resources that could have otherwise been invested in long-term assets are naturally squeezed.

Table 7. Size Heterogeneity

	(1) Large Firms (LONGINV)	(2) Medium Firms (LONGINV)	(3) Small Firms (LONGINV)
L.LONGINV	0.590*** (22.051)	0.429*** (22.907)	0.322*** (8.057)
L.FINAN	-0.009 (-0.803)	-0.007 (-0.813)	-0.032** (-2.174)
L.asset	0.048 (0.906)	-0.072 (-1.108)	-0.114 (-0.836)
L.income	0.034*** (3.133)	0.059*** (4.877)	0.073*** (4.485)
L.cost	-0.034*** (-3.055)	-0.058*** (-4.629)	-0.074*** (-4.370)
L.lev	-0.015*** (-4.095)	-0.014*** (-4.246)	-0.023*** (-4.142)
L.Q	0.052** (2.316)	0.016 (1.217)	0.000 (0.189)
L.concen	0.001 (0.480)	0.015*** (5.285)	0.026*** (4.100)
L.foage	-0.135 (-0.937)	-0.649*** (-4.653)	-1.425*** (-5.327)
Constant	2.045*** (3.489)	4.572*** (9.150)	7.010*** (7.121)
Year Fixed Effect	Yes	Yes	Yes
Obs	9109	16427	6140
AR2 (p value)	0.027	0.141	0.123

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

5.3.4. Profit Heterogeneity

Profit-making firms and loss-making firms may have different tendencies in investment decisions. This section divides all observed values in the sample into profitable and unprofitable sub samples based on whether the net profit is greater than zero, and performs regressions separately. The regression results are shown in Table 8. It can be seen that the increase in the financial asset ratio only has a negative effect on the long-term investment

expenditures of profitable firms, and does not affect the long-term investment expenditures of unprofitable firms. One possible explanation can be that loss-making firms find it difficult to obtain external financing from banks and other financial institutions, thus lacking external funds for long-term investment activities. For loss-making firms, financial assets with high liquidity may have played a certain "reservoir" effect, helping them alleviate financing constraints and operational difficulties, thereby increasing long-term investment expenditures.

Table 8. Profit Heterogeneity

	(1) Profitable Firms (LONGINV)	(2) Unprofitable Firms (LONGINV)
L.LONGINV	0.457*** (24.374)	0.418*** (8.695)
L.FINAN	-0.017** (-2.412)	0.017 (0.698)
L.asset	-0.027 (-0.729)	0.063 (0.939)
L.income	0.063*** (6.129)	0.051*** (2.737)
L.cost	-0.064*** (-5.929)	-0.050*** (-2.623)
L.lev	-0.012*** (-4.348)	-0.017*** (-3.681)
L.Q	0.002 (1.120)	-0.002 (-0.193)
L.concen	0.009*** (4.038)	0.015*** (3.173)
L.foage	-0.640*** (-5.429)	-0.728*** (-2.905)
Constant	4.629*** (10.973)	3.765*** (4.130)
Year Fixed Effect	Yes	Yes
Obs	27554	4122
AR2 (p value)	0.221	0.902

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.4. Robustness Tests

5.4.1. Dealing with Potential Endogeneity

The benchmark regression model characterizes the relationship between the financial asset ratio and the long-term investment expenditure ratio of listed firms. However, the choice of firms to hold financial assets is not random. For example, Hu et al. (2017) found that companies with good operational abilities, good financial conditions, and high Tobin's Q values allocate more funds to financial assets[10]. That is, the decision to hold financial assets is the result of a firm's "self selection". In this case, simply estimating the baseline regression model will yield biased results due to endogeneity issues. In order to deal with the potential endogeneity caused

by self selection, this section uses propensity score matching (PSM) to study the impact of the financial asset ratio on long-term investment expenditures of firms. To ensure the robustness of PSM estimation results, this section uses kernel matching method, 1:10 nearest neighbor matching method, 1:5 nearest neighbor matching method, and caliper matching method for estimation. Among them, Gaussian kernel is used as the kernel function for kernel matching; The caliper size for caliper matching is set to the sample standard deviation of propensity score. The covariates used for matching are the control variables used in the previous text. The matching in this section uses logit to estimate propensity scores and only matches individuals on the common support. The reliability of PSM estimation can be verified by comparing the results obtained using the four matching methods. To ensure the timeliness of the estimation results, the PSM treatment group consists of firms that hold financial assets in 2022, while the control group consists of firms that do not hold any financial assets in 2022. The outcome variable is the long-term investment expenditure ratio of the above-mentioned firms in 2023. The quality of PSM matching can be examined by the balancing test. The results of the test are shown in Table 9. After matching, the standardized deviation of all covariates is less than 10%. Moreover, the vast majority of t-test results do not reject the null hypothesis that “there is no systematic difference between the treatment group and the control group”. Therefore, it can be considered that after matching, the treatment group and control group are strongly comparable.

Table 9. Covariate Balancing Test

Covariates	Matching Status	Mean		Standardized Bias	Reduction in Standardized Bias (%)	T Statistic
		Treatment Group	Control Group			
L.asset	Before	4.0204	3.7793	18.5	50.7	5.49 ***
	After	4.0128	3.894	9.1		3.30 ***
L.income	Before	62.813	58.835	8.6	57.9	2.47 **
	After	62.114	60.441	3.6		1.37
L.cost	Before	58.187	55.597	5.7	47.4	1.63
	After	57.489	56.126	3		1.14
L.lev	Before	38.724	43.858	-26.3	95.1	-7.96 ***
	After	38.7	38.949	-1.3		-0.48
L.Q	Before	2.876	3.5908	-12.8	92.5	-4.13 ***
	After	2.8803	2.8264	1		0.55
L.concen	Before	53.249	51.741	9.4	76.4	2.83 ***
	After	53.198	52.841	2.2		0.80
L.foage	Before	3.0142	3.0475	-10.7	66.5	-3.20 ***
	After	3.0139	3.025	-3.6		-1.28

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The PSM estimation results are shown in Table 10. It can be seen that under the four matching methods, the average treatment effect (ATT) obtained by PSM is negative and significant at least at the 5% level. This indicates that the PSM results support the conclusion of the regressions in the previous sections. Holding financial assets indeed has a crowding out effect on the long-term investment of firms.

Table 10. Average Treatment Effect Obtained from Propensity Score Matching

Matching Method	ATT	T Statistic	Obs
Kernel Matching	-0.360**	-2.05	3998
1: 10 Nearest Neighbor Matching	-0.463**	-2.50	3998
1: 5 Nearest Neighbor Matching	-0.529***	-2.76	3998
Caplier Matching	-0.381**	-2.14	3998

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.4.2. Replacing Variables

This section uses "cash paid for the purchase and construction of fixed assets, intangible assets, and other long-term assets" to replace the long-term investment variable represented by the difference between "cash paid for the purchase and construction of fixed assets, intangible assets, and other long-term assets" and "cash received from the disposal of fixed assets, intangible assets, and other long-term assets", which has been used in the above sections of the article. The use of this alternative variable only takes into account the cash outflow caused by corporate long-term investment, while ignoring the cash inflow obtained from the disposal of long-term investments. The regression results after replacing the explained variable is shown in Table 11. It can be seen that the estimated coefficient of financial asset ratio is still negative and significant at the 1% level. The "crowding out effect" of financialization on long-term investment of firms discovered previously has once again been verified.

Table 11. Replacing the Explained Variable

	(1) CAPEX
L.CAPEX	0.506*** (34.801)
L.FINAN	-0.017*** (-2.819)
L.asset	-0.032 (-1.063)
L.income	0.050*** (7.566)
L.cost	-0.050*** (-7.236)
L.lev	-0.012*** (-5.417)
L.Q	0.002 (0.902)
L.concen	0.009*** (4.528)
L.foage	-0.514*** (-5.285)
Constant	3.908*** (11.093)
Year Fixed Effect	Yes
Obs	31676
AR2 (p value)	0.579

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In some literature, investment property is also considered as a type of financial asset. The reason is that the motivation for firms to hold investment property is similar to the motivation for holding traditional financial assets, both of which are to obtain cyclical cash inflows and capital appreciation (Du et al., 2017)[4]. Moreover, investment property also has a relatively active trading market, which can meet the trading needs of firms. This section incorporates investment property as a financial asset and calculate a new variable for the holding rate of financial assets $FINAN2_{i,t-1}$. Replacing $FINAN_{i,t-1}$ with $FINAN2_{i,t-1}$, equation (1) is re-estimated. The regression results are shown in Table 12. The estimated coefficient of $FINAN2_{i,t-1}$ is still negative and statistically significant at the 5% level. This indicates that the crowding out effect of corporate financial asset positions on long-term investment expenditures, as discovered earlier, is reliable.

Table 12. Replacing the Main Explanatory Variable

	(1) LONGINV
L.LONGINV	0.461*** (28.843)
L.FINAN2	-0.013** (-2.069)
L.asset	0.009 (0.261)
L.income	0.063*** (7.040)
L.cost	-0.063*** (-6.738)
L.lev	-0.016*** (-6.152)
L.Q	0.002 (0.683)
L.concen	0.009*** (4.435)
L.foage	-0.550*** (-5.070)
Constant	4.191*** (11.038)
Year Fixed Effect	Yes
Obs	31676
AR2 (p value)	0.159

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6. Conclusion

Through empirical analysis based on data of China's listed companies, this article examines the relationship between corporate financial asset positions and long-term investment. It is found that the higher the proportion of financial assets in total assets, the lower the corporate long-term investment expenditure ratio. This finding is consistent with existing literature supporting the crowding out effect of corporate financialization. Moreover, this crowding out

effect is mainly found among firms in the real sector, especially the manufacturing sector. Also, it is found that financialization has a significant negative impact on the long-term investment expenditure of small firms. In order to deal with potential endogeneity issues, this article uses the PSM method to re-examine how financial asset positions affect firms' long-term investment expenditures. The estimation results from PSM still supports the crowding out effect. In addition, this article also conducted robustness tests by replacing key explanatory variables and the explained variable. The regression results obtained using alternative measurements for long-term investment and financial asset positions supports the existence of the crowding out effect.

It is worth noting that from certain perspectives, the role that financialization plays in corporate long-term investment is not that negative. For example, it's found that financialization cannot significantly change a company's asset structure in a short period of time. The impact of financial asset positions can vary in different economic environments. The crowding out effect and reservoir effect may dominate at different occasions. Firms' decision to allocate resources to financial assets should not be simply denied. During the Covid-19 epidemic, the negative impact of corporate financialization on long-term investment was alleviated. This may be due to the fact that financial assets provided a source of working capital for firms during the epidemic, when opportunities for real industrial investment decreased and profit margins declined. Financial asset positions helped firms maintain their long-term investment activities during difficult times and thus partially offset their crowding out effect.

Due to data limitations, this article has only conducted research on the holding level of financial asset positions and has not addressed the impact that market value fluctuations of financial asset positions have on corporate long-term investment expenditures. This issue still requires further research.

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