The Impact of Capital Structure on Corporate Performance of Domestic Listed Non-Bank Financial Enterprises

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Abstract. This study explores the relationship between capital structure and corporate performance in the non-bank financial industry. By analyzing non-bank financial firms across multiple regions and industries, it is found that capital structure generally exhibits a negative correlation with corporate performance. As the debt-to-asset ratio increases, the net return on assets decreases. The empirical results show that the negative correlation is particularly evident in the eastern regions, remains significant in the western regions, but is no longer significant in the central regions. For state-owned enterprises, a moderate increase in debt can enhance corporate performance to some extent, whereas for private enterprises, a moderate reduction in debt can promote corporate performance. Based on these findings, this paper proposes corresponding policy and practical recommendations to optimize capital structure investment, improve corporate performance, and promote the sustainable development of the industry.

Keywords: Non-bank financial, capital structure, corporate performance

1. Introduction

Corporate performance is a comprehensive reflection of a company's operational capability, developmental ability, profitability, and solvency. The Central Economic Work Conference held at the end of 2023 emphasized that the global economy and trade have not fully recovered to pre-pandemic levels. Economic circulation still faces blockages, with weak consumer spending, insufficient corporate investment willingness, subdued social expectations, and businesses hesitating or unwilling to invest. Addressing these issues requires improving corporate performance across sectors to fundamentally restore public confidence, thereby resolving the sluggish economic recovery. Thus, studying how to enhance corporate performance is particularly necessary under the current domestic and international context.

The rationality of capital structure significantly influences corporate decision-making and long-term development and is one of the key factors affecting corporate performance. Since the outbreak of the COVID-19 pandemic, the global economy has faced negative impacts, prompting countries to adopt loose stimulus policies to mitigate the economic crisis. This has led to a significant rise in corporate leverage ratios, increasing debt risks and causing inefficiencies in capital allocation and low capital utilization rates. Therefore, research on the rationality of capital structure across industries is of great importance.

Post-pandemic, economic recovery has become a top priority in economic work. The recovery relies heavily on service consumption and other large-scale consumption activities. Optimizing financial services and enhancing the effectiveness of financial support for consumption have garnered extensive attention. Given that the non-bank financial industry occupies a dominant position in the national financial system and has an increasingly significant impact on the real economy, improving the performance of the non-bank financial sector can significantly accelerate China's economic development, change public perceptions of the economic situation, speed up economic recovery, and promote a thriving consumer market.

Non-bank financial institutions, such as mutual funds, private equity funds, pawnshops, guarantee companies, and microfinance companies, typically raise funds through issuing stocks, bonds, accepting credit entrustments, and providing insurance. These funds are then utilized for long-term investments to generate profits, resulting in complex capital structures due to the need for long-term operations and diverse financing methods. Under the urgent need to enhance the performance of the non-bank financial sector, understanding which capital structure best facilitates the rapid development of this industry becomes particularly important. Given the limited research in the field of non-bank finance, this paper holds unique significance and value.

Since the Modigliani-Miller (MM) theorem was proposed in the 1950s, domestic academic research has extensively explored the impact of capital structure on corporate performance. Existing studies on the correlation between capital structure and corporate performance in China can be broadly categorized into three perspectives: (1) Negative Correlation. Wu, Z. J., & Liu, H. used a multiple regression method on manufacturing companies listed on the Shanghai and Shenzhen A-share markets, finding that capital structure negatively impacts corporate performance under other equal conditions, and the proportion of independent directors exacerbates this negative impact[1]. Liao, J. J. analyzed annual reports of listed new energy companies using data from the CSMAR database and employed multiple linear regression, confirming that asset-liability ratio, long-term debt ratio, and short-term debt ratio, as measures of capital structure, are negatively correlated with corporate performance[2]. (2) Positive Correlation. Lü, H. X. selected data based on the Shenwan industry classification standard and used ordinary least squares regression and a random-effects model, demonstrating that for pharmaceutical and healthcare companies, capital structure and corporate performance are significantly positively correlated[3]. Zhu, W. L., & Zhang, X. studied 89 listed logistics companies using canonical correlation analysis and confirmed that the long-term debt ratio positively impacts operational performance in China's logistics industry[4]. (3) Nonlinear Correlation. Ren, Z. Q., Huang, A., & Yu, X. K. employed a double-panel threshold model with data from the iFinD and CSMAR databases to validate a significant inverted U-shaped relationship between capital structure and operational performance in high-tech enterprises[5]. This influence also exhibits heterogeneity based on industry, corporate growth, and R&D investment. Sun, S. N. used threshold regression models with data from all A-share listed companies from 2010 to 2020 and confirmed that the impact of capital structure on corporate performance exhibits a threshold effect[6]. When financial leverage is low, a higher proportion of debt in the capital structure positively impacts corporate performance. However, once financial leverage exceeds a certain level, the impact becomes negative.

Marginal Contributions of This Paper: (1) Most domestic studies to date have focused on traditional industries and real economy sectors, with limited research on the impact of capital structure on corporate performance in the non-bank financial industry. (2) This study closely aligns with the current domestic conditions and global economic situation, addressing topics of contemporary relevance and practical significance. (3) The research is comprehensive, conducting

separate regression analyses on both corporate capital structure and corporate performance to ensure a thorough evaluation.

2. Theoretical analysis and research hypotheses

Due to the unique operational models and regulatory environments of non-bank financial enterprises, their capital structure decision-making mechanisms differ significantly from those of traditional industrial enterprises. Therefore, examining the impact of capital structure on corporate performance requires analysis from multiple economic theoretical perspectives.

2.1. Analysis of the relationship between capital structure and corporate performance

First, from the perspective of signaling theory, a firm's choice of financing structure essentially serves as a mechanism to convey internal information to external investors[7]. For non-bank financial enterprises, a higher debt ratio may be interpreted as a signal of strong confidence in future cash flow and profitability. Particularly in industries where asset securitization and leverage operations are prevalent, high leverage is often regarded as a symbol of robust risk management and sound operational capabilities.

Second, according to agency theory, changes in capital structure significantly affect internal corporate governance[8]. A higher level of debt introduces external creditors as supervisory bodies, reducing agency conflicts between managers and shareholders, thereby enhancing operational efficiency and governance.

Third, based on the modified Modigliani-Miller theory, when considering real-world factors such as tax benefits, bankruptcy costs, and information asymmetry, moderate debt financing can leverage the "tax shield effect" to increase corporate value[9]. However, excessive leverage can lead to bankruptcy risks, financial distress costs, and restricted external financing, ultimately inhibiting corporate performance. For non-bank financial enterprises, which are highly sensitive to liquidity, excessive leverage may reduce their ability to allocate funds and respond to risks, thereby negatively impacting operational efficiency and profitability.

Finally, according to the pecking order theory, firms typically prefer internal financing, followed by debt financing, and lastly equity issuance when addressing financing needs[10]. Non-bank financial enterprises, due to their high demand for capital, tend to rely on debt financing to expand their operations when internal capital accumulation is insufficient. However, over-reliance on debt financing can lead to rising leverage levels, accumulating financial risks, and ultimately suppressing corporate performance.

In summary, capital structure affects corporate performance through signaling, agency governance, tax shield effects, and financing preferences. Based on this, the following hypothesis is proposed:

Hypothesis H1: There is a negative overall relationship between capital structure and corporate performance.

2.2. The moderating effect of equity balance

In corporate equity structures, a high shareholding proportion of the largest shareholder may lead to "insider control" issues, harming the interests of minority shareholders[11]. In contrast, a higher degree of equity balance helps to effectively constrain the behavior of the largest shareholder, optimizing corporate governance structures. According to governance theory, a reasonable equity

balance mechanism can encourage firms to make more prudent financing decisions under high-leverage operating conditions, thereby mitigating the negative impact of capital structure on performance[12]. Based on this, the following hypothesis is proposed:

Hypothesis H2: Equity balance positively moderates the negative relationship between capital structure and corporate performance.

2.3. Theoretical logic of heterogeneity analysis

2.3.1. Regional heterogeneity

The availability of capital and the ability to manage capital structures vary across regions with different levels of economic development. In eastern regions, where market mechanisms are more developed and competition is more intense, the negative impact of capital structure on performance is more pronounced[13]. Conversely, the impact is weaker in central and western regions, which often receive more policy support. Based on this, the following hypothesis is proposed:

Hypothesis H3: The negative impact of capital structure on corporate performance is more significant in eastern regions.

2.3.2. Ownership heterogeneity

Ownership structure also moderates the relationship between capital structure and performance. State-owned enterprises (SOEs), due to their "implicit guarantee" advantages, are more likely to have their high leverage interpreted as a signal of stable expansion, enabling greater financing convenience and risk tolerance. In contrast, private enterprises, lacking government credit backing, may have their high leverage perceived as high risk, increasing market concerns and negatively affecting corporate performance[14]. Based on this, the following grouped hypotheses are proposed:

Hypothesis H4a: In state-owned enterprises, capital structure is positively correlated with performance.

Hypothesis H4b: In private enterprises, capital structure is negatively correlated with performance.

3. Research design

3.1. Sample selection and data sources

This study uses the data of A-share listed non-bank financial enterprises in China from 2015 to 2024 to empirically examine the impact of capital structure on corporate performance. Non-bank financial enterprises are selected as the sample due to both data availability and the fact that the non-bank financial industry has been a key focus of economic recovery efforts post-pandemic. Studying the optimization of capital structures in non-bank financial enterprises holds strong practical value.

The data sources include Sina Finance, CSMAR (China Stock Market & Accounting Research) database, and the WIND database. Based on the collected raw data, the following processing steps were performed:

Exclude firms that were classified as "ST" (Special Treatment) during the sample period.

Remove samples with excessive missing observations for variables.

Use the mean substitution method for samples with minimal missing values.

Supplement data through manual review where information was insufficient.

After the above processing, a total of 622 samples were obtained for this study.

3.2. Variable definitions

3.2.1. Dependent variables

To scientifically measure the performance of non-bank financial enterprises, this study constructs a performance indicator system from two dimensions: profitability and growth capacity. Representative financial variables are selected for measurement as follows: Profitability Indicator: Profitability is the core reflection of corporate performance, indicating a firm's ability to generate profits through resource allocation and operations. Common metrics include return on assets (ROA), return on equity (ROE), and Tobin's Q. Given the underdevelopment of China's capital markets and the volatility of stock prices, Tobin's Q is not a reliable measure of market performance. Additionally, unlike traditional industries, non-bank financial enterprises primarily hold financial assets, which are highly liquid and variable, making traditional metrics like operating profit margin less effective. Thus, return on assets (ROA) (annual net profit / average total assets) is used as the profitability measure. Growth Capacity Indicator: Growth capacity reflects a firm's potential for sustainable profitability and market expansion. Non-bank financial enterprises primarily generate revenue from interest, fees, and investment income, which are volatile. Therefore, a single point-in-time profit measure cannot comprehensively reflect growth potential. This study uses revenue growth rate (Growth) ((current period total revenue - prior period total revenue) / prior period total revenue) as the core growth capacity indicator. This metric reflects the expansion speed of core business revenue, measuring the acceptance of products or services in the market and the scale growth potential. According to growth theory, revenue growth not only reflects market competitiveness but also serves as an important leading indicator of future profitability[15].

3.2.2. Independent variables

In exploring the impact of capital structure on corporate performance, most existing studies focus solely on debt structure. However, as an essential component of corporate governance mechanisms, equity structure can offer a more comprehensive explanation of the relationship between internal governance, shareholder behavior, and firm performance—especially valuable for analyzing the differences between state-owned and private enterprises and for testing moderating effects. Therefore, this study measures capital structure from two dimensions: debt structure and equity structure.

Debt Structure Indicator: The most commonly used indicator to measure a firm's debt structure is the Debt-to-Asset Ratio (DAR), calculated as total liabilities divided by total assets. It is the most intuitive, accessible, and explanatory measure of capital structure. The DAR not only reflects a firm's reliance on external financing but also affects its cost of capital, risk exposure, and financial stability. According to the capital structure theory of Modigliani and Miller and the trade-off theory, changes in capital structure have a significant impact on firm value under real-world conditions involving taxes, bankruptcy costs, and information asymmetry[16]. Moreover, for non-bank financial institutions, whose operations inherently depend on leverage, the DAR more accurately reflects the core characteristics of capital operations.

Equity Structure Indicator: First, this paper selects the shareholding ratio of the largest shareholder (Holder), calculated as the number of shares held by the largest shareholder divided by the total number of shares, to measure the concentration of control. This variable reflects the dominant role of the controlling shareholder in corporate decision-making. Theoretically, a higher concentration of ownership can enhance supervision and reduce agency problems, thereby

improving firm performance; however, there is also the possibility of expropriation by large shareholders, which may harm the interests of minority shareholders and lead to a decline in performance[17].

3.2.3. Moderating variables

Equity balance is chosen as the moderating variable. Two measures are considered: Equity Balance 5 (BALA5): Sum of the shareholding proportions of the 2nd to 5th largest shareholders / largest shareholder's shareholding. Equity Balance 10 (BALA10): Sum of the shareholding proportions of the 2nd to 10th largest shareholders / largest shareholder's shareholding. The variable with better moderating effects is selected for analysis.

3.2.4. Control variables

Referring to existing studies, control variables include firm size (log of total assets), firm age (years since listing), independent director ratio, management team size (logarithm of the number of executives), price-to-book ratio (PB), depreciation and amortization (D&A), and total shares outstanding.

4. Empirical analysis

4.1. Baseline regression

A baseline regression was conducted using fixed effects for both stocks and time. The regression results indicate that the explanatory variable, debt-to-asset ratio (DAR), has a significant impact on both return on assets (ROA) and revenue growth rate (Growth). Specifically, the regression coefficient for ROA is negative, while the coefficient for revenue growth rate is positive. This suggests that an increase in DAR leads to a decrease in ROA but an increase in revenue growth rate. More specifically, under constant conditions: For every 1% increase in DAR, corporate performance (measured by ROA) decreases by 0.19% on average. For every 1% increase in DAR, corporate performance (measured by revenue growth rate) increases by 0.76% on average.

However, the largest shareholder's ownership ratio (Holder) does not have a significant impact on either ROA or revenue growth rate. Additionally, control variables such as firm size, years since listing, and price-to-book ratio (PB) all have a significant impact on corporate performance.

Table 1: Regression results

Variables	(1) Net interest rate	(2) Net interest rate	(3) Increase rate of business revenue	(4) Increase rate of business revenue
Asset-liability ratio	-0.190***		0.762**	
	(0.02)		(0.40)	
Shareholding ratio of the largest shareholder		-0.000		-0.001
		(0.00)		(0.01)
Company size	0.028***	0.014***	0.186***	0.243***
	(0.00)	(0.00)	(0.06)	(0.05)
Listing period	-0.005***	-0.005***	-0.072***	-0.074***
	(0.00)	(0.00)	(0.01)	(0.01)
Number of management personnel	0.000	0.001	-0.010	-0.012
	(0.00)	(0.00)	(0.01)	(0.01)
Depreciation and amortization	0.000	0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Price-to-book ratio	-0.000***	-0.001***	-0.001	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)
Total shares	-0.000***	-0.000*	-0.000*	-0.000**
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.426***	-0.193***	-2.471**	-3.371***
	(0.07)	(0.07)	(1.10)	(1.02)
Observations	622	622	622	622

Standard errors in parentheses

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

4.2. Moderation effect

Since only DAR showed a significant effect on corporate performance in the baseline regression, moderation analysis was conducted using Balance 5 (BALA5) and Balance 10 (BALA10) as moderating variables. Interaction terms between the moderating variables and DAR were added to the regression model. The results show that BALA5 has a more significant moderating effect, so it was chosen as the final moderating variable. The regression results indicate that in the moderation analysis, DAR significantly affects both ROA and revenue growth rate, with consistent significance and direction as in the fixed effects results. Specifically: For every 1% increase in DAR, ROA decreases by 0.26% on average. For every 1% increase in DAR, revenue growth rate increases by 0.79% on average.

However, in the moderation analysis, the moderating variable (BALA5) and its interaction term with DAR are significant only for ROA, not for revenue growth rate. Since the interaction term is significant and its coefficient is positive, BALA5 positively moderates the relationship between DAR and ROA, mitigating the negative effect of DAR on ROA.

Table 2: Moderation results

Variables	(1) Net interest rate	(2) Increase rate of business revenue
Asset-liability ratio	-0.257***	0.789**
	(0.03)	(0.36)
Asset-liability ratio 5	-0.070***	-0.078
	(0.02)	(0.08)
Interaction	0.010***	0.005
	(0.03)	(0.01)
Company size	0.027***	0.190***
	(0.00)	(0.06)
Listing period	-0.006***	-0.072***
	(0.00)	(0.01)
Number of management personnel	0.000	-0.008
	(0.00)	(0.02)
Depreciation and amortization	0.000	-0.000
	(0.00)	(0.00)
Price-to-book ratio	-0.000***	-0.001
	(0.00)	(0.00)
Total shares	-0.000***	-0.000*
	(0.00)	(0.00)
Constant	-0.344***	-2.567**
	(0.07)	(1.11)
Observations	622	622

Standard errors in parentheses

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

4.3. Robustness tests

To ensure the robustness of the results, two methods were applied: (1) Changing the fixed effects structure (using industry × time instead of stock × time). (2) Winsorizing variables at the 1% level to remove outliers[18].

Robustness Test 1: The fixed effects of stock and time were replaced with industry and time. The results show: DAR has a significant negative impact on ROA, confirming robustness. Holder has no

significant impact on either ROA or revenue growth rate, and its regression coefficients remain negative, confirming robustness. DAR no longer has a significant impact on revenue growth rate, though the coefficient remains positive but much smaller. Considering that the explanatory variable cannot fully explain revenue growth rate, it is suggested that revenue growth rate be excluded as a measure of corporate performance.

Table 3: Robustness Test 1 results

Variables	(1) Net interest rate	(2) Net interest rate	(3) Increase rate of business revenue	(4) Increase rate of business revenue
Asset-liability ratio	-0.108***		0.157	
	(0.01)		(0.22)	
Shareholding ratio of the largest shareholder		-0.000		-0.000
		(0.00)		(0.00)
Company size	0.012***	0.003**	0.040	0.053***
	(0.00)	(0.00)	(0.03)	(0.02)
Listing period	-0.000	-0.000	-0.005*	-0.005*
	(0.00)	(0.00)	(0.00)	(0.00)
Number of management personnel	-0.000	0.000	-0.014*	-0.015*
	(0.00)	(0.00)	(0.01)	(0.01)
Depreciation and amortization	-0.000**	-0.000*	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Price-to-book ratio	-0.000***	-0.001***	-0.001	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)
Total shares	-0.000**	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0l00)
Constant	-0.169***	-0.039	-0.5	-0.692
	(0.04)	(0.03)	(0.54)	(0.47)
Observations	622	622	622	622

Standard errors in parentheses

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

Robustness Test 2: Explanatory variables (except years since listing, management size, and total shares) were winsorized at the 1% level, and the baseline regression was repeated. The results show: DAR has a significant negative impact on ROA, confirming robustness. Holder has no significant impact on either ROA or revenue growth rate, confirming robustness. DAR no longer has a significant impact on revenue growth rate, consistent with the first robustness test. Considering the results, it is again suggested that revenue growth rate not be used as a measure of corporate performance.

Table 4: Robustness Test 2 results

Variables	(1) Net interest rate shrank	(2) Net interest rate shrank	(3) Increase rate of business revenue shrank	(4) Increase rate of business revenue shrank
Asset-liability ratio shrank	-0.119***		0.223	
	(0.02)		(0.37)	
Shareholding ratio of the largest shareholder shrank		0.000		0.001
		(0.00)		(0.00)
Company size shrank	0.022***	0.011***	0.227***	0.247***
	(0.00)	(0.00)	(0.06)	(0.05)
Listing period	-0.004***	-0.004***	-0.061***	-0.060***
	(0.00)	(0.00)	(0.01)	(0.01)
Number of management Personnel	0.000	0.000	-0.008	-0.009
	(0.00)	(0.00)	(0.01)	(0.01)
Depreciation and amortization shrank	0.000	0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Price-to-book ratio shrank	0.001	-0.001**	0.045***	0.050***
	(0.00)	(0.00)	(0.02)	(0.01)
Total shares	-0.000**	-0.000	-0.000	-0.000*
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.349***	-0.146***	-3.595***	-4.018***
	(0.05)	(0.05)	(1.19)	(1)
Observations	622	622	622	622

Standard errors in parentheses

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

5. Heterogeneity analysis

5.1. Regional heterogeneity analysis

Four groups of heterogeneity analyses were conducted for the two explanatory variables (DAR, Holder) and the two outcome variables (ROA, Growth).

DAR and ROA: The regression results show that DAR has a significant negative impact on ROA for firms in both eastern and western regions. This indicates that an increase in DAR reduces ROA for firms in these regions. However, DAR does not have a significant impact on ROA for firms in the central region.

Table 5: Results of regional heterogeneity analysis on DAR and ROA

	(1)East	(2)Middle	(3)West
Variables	Net interest rate	Net interest rate	Net interest rate
Asset-liability ratio	-0.313***	0.00288	-0.0672**
	(0.03)	(0.09)	(0.03)
Company size	0.030***	0.025**	0.018**
	(0.01)	(0.01)	(0.01)
Listing period	-0.005***	-0.006***	-0.003**
	(0.00)	(0.00)	(0.00)
Number of management personnel	0.000	0.001	-0.000
	(0.00)	(0.00)	(0.00)
Depreciation and amortization	0.000	0.000	-0.000
	(0.00)	(0.00)	(0.00)
Price-to-book ratio	0.003***	-0.001***	0.003
	(0.00)	(0.00)	(0.00)
Total shares	-0.000***	-0.000	-0.000
	(0.00)	(0.00)	(0.00)
Constant	-0.296**	-0.417*	-0.382**
	(0.15)	(0.22)	(0.19)
Observations	377	142	103

Standard errors in parentheses

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

DAR and Growth: The regression results show that DAR does not have a significant impact on revenue growth rate in any of the three regions (eastern, central, or western).

Table 6: Results of regional heterogeneity analysis on DAR and growth

Variables	(1)East	(2)Middle	(3)West
	Increase rate of business revenue	Increase rate of business revenue	Increase rate of business revenue
Asset-liability ratio	0.482	1.212	-1.291
	(0.43)	(1.55)	(1.50)
Company size	0.169**	0.192	0.669*
	(0.07)	(0.21)	(0.40)
Listing period	-0.060***	-0.079**	-0.009
	(0.02)	(0.04)	(0.06)
Number of management personnel	-0.002	-0.031	-0.024
	(0.02)	(0.04)	(0.06)
Depreciation and amortization	0.000	-0.000	0.000
	(0.00)	(0.00)	(0.00)
Price-to-book ratio	0.016	-0.003	0.234**
	(0.01)	(0.00)	(0.09)
Total shares	-0.000***	0.000	-0.000
	(0.00)	(0.00)	(0.00)
Constant	-1.345	-2.528	0.000
	(1.88)	(3.91)	(0.00)
Observations	377	142	103

Standard errors in parentheses

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

Holder and ROA: The regression results show that Holder has a significant negative impact on ROA for firms in the eastern region, indicating that a higher ownership concentration by the largest shareholder reduces ROA. However, Holder does not have a significant impact on ROA for firms in the central or western regions.

Table 7: Results of regional heterogeneity analysis on holder and ROA

	(1)East	(2)Middle	(3)West
Variables	Net interest rate	Net interest rate	Net interest rate
Shareholding ratio of the largest shareholder	-0.001**	0.000	-0.000
	(0.00)	(0.00)	(0.00)
Company size	0.002	0.026***	0.004
	(0.01)	(0.01)	(0.00)
Listing period	-0.005***	-0.006***	-0.003**
	(0.00)	(0.00)	(0.00)
Number of management personnel	0.001	0.001	-0.001
	(0.00)	(0.00)	(0.00)
Depreciation and amortization	0.000***	0.000	-0.000
	(0.00)	(0.00)	(0.00)
Price-to-book ratio	-0.003***	-0.001***	0.001
	(0.00)	(0.00)	(0.00)
Total shares	-0.000**	-0.000	-0.000
	(0.00)	(0.00)	(0.00)
Constant	0.229	-0.434***	0.000
	(0.16)	(0.16)	(0.00)
Observations	377	142	103

Standard errors in parentheses

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

Holder and Growth: The regression results show that Holder does not have a significant impact on revenue growth rate in any of the three regions.

Table 8: Results of regional heterogeneity analysis on holder and growth

Variables	(1)East	(2)Middle	(3)West
	Increase rate of business revenue	Increase rate of business revenue	Increase rate of business revenue
Shareholding ratio of the largest shareholder	-0.001	0.014	-0.011
	(0.01)	(0.02)	(0.03)
Company size	0.210***	0.320**	0.392*
	(0.06)	(0.14)	(0.23)
Listing period	-0.061***	-0.080**	-0.005
	(0.02)	(0.04)	(0.06)
Number of management personnel	-0.004	-0.029	-0.031
	(0.02)	(0.04)	(0.06)
Depreciation and amortization	0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)
Price-to-book ratio	0.023**	-0.003	0.189**
	(0.01)	(0.00)	(0.09)
Total shares	-0.000***	0.000	0.000
	(0.00)	(0.00)	(0.00)
Constant	-1.979	-5.176*	-9.422*
	(1.81)	(2.76)	(5.67)
Observations	377	142	103

Standard errors in parentheses

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

Based on these results, the second and fourth groups of analyses indicate no significance, suggesting that revenue growth rate is not a valid measure of corporate performance in regional heterogeneity analysis. For eastern and western firms, reducing DAR can improve ROA (corporate performance). For eastern firms, reducing Holder can also improve ROA.

5.2. Ownership heterogeneity analysis

Since the sample includes only state-owned enterprises (SOEs) and private enterprises in significant numbers, heterogeneity analysis was conducted for these two groups.

DAR and ROA: The regression results show that DAR has a significant negative impact on ROA for both SOEs and private enterprises. However, the effect is more pronounced for private enterprises.

Table 9: Results of ownership heterogeneity analysis on DAR and ROA

	(1)State-owned enterprise	(2)Privately operated enterprise
Variables	Net interest rate	Net interest rate
Asset-liability ratio	-0.030***	-0.259***
	(0.01)	(0.07)
Company size	0.018***	0.050***
	(0.00)	(0.017)
Listing period	-0.002***	-0.015***
	(0.00)	(0.00)
Number of management personnel	-0.000	0.002
	(0.00)	(0.01)
Depreciation and amortization	-0.000	0.000
	(0.00)	(0.00)
Price-to-book ratio	0.003***	-0.001
	(0.00)	(0.00)
Total shares	-0.000**	-0.000**
	(0.00)	(0.00)
Constant	-0.369***	-0.650**
	(0.03)	(0.31)
Observations	412	127

Standard errors in parentheses

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

DAR and Growth: The regression results show that DAR has a significant positive impact on revenue growth rate for SOEs, with a large coefficient, indicating that an increase in DAR substantially increases revenue growth for SOEs. For private enterprises, however, DAR does not have a significant impact on revenue growth rate.

Table 10: Results of ownership heterogeneity analysis on DAR and growth

Variables	(1)State-owned enterprise	(2)Privately operated enterprise
	Increase rate of business revenue	Increase rate of business revenue
Asset-liability ratio	2.198***	0.416
	(0.63)	(0.71)
Company size	0.173**	0.207
	(0.07)	(0.18)
Listing period	-0.052***	-0.081*
	(0.02)	(0.05)
Number of management personnel	-0.014	-0.011
	(0.01)	(0.08)
Depreciation and amortization	-0.000	-0.000
	(0.00)	(0.00)
Price-to-book ratio	0.054	-0.002
	(0.04)	(0.00)
Total shares	-0.000	-0.000*
	(0.00)	(0.00)
Constant	-4.315**	-2.702
	(1.70)	(3.27)
Observations	412	127

Standard errors in parentheses

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

Holder and ROA: The regression results show that Holder does not have a significant impact on ROA for either SOEs or private enterprises.

Table 11: Results of ownership heterogeneity analysis on holder and ROA

	(1)State-owned enterprise	(2)Privately operated enterprise
Variables	Net interest rate	Net interest rate
Shareholding ratio of the largest Shareholder	0.000	-0.001
	(0.00)	(0.00)
Company size	0.016***	0.026
	(0.00)	(0.012)
Listing period	-0.002***	-0.015***
	(0.00)	(0.00)
Number of management personnel	-0.000	0.012
	(0.00)	(0.01)
Depreciation and amortization	-0.000	0.000
	(0.00)	(0.00)
Price-to-book ratio	0.002***	-0.001**
	(0.00)	(0.00)
Total shares	-0.000**	-0.000*
	(0.00)	(0.00)
Constant	-0.343***	-0.233
	(0.03)	(0.32)
Observations	412	127

Standard errors in parentheses

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

Holder and Growth: The regression results show that Holder does not have a significant impact on revenue growth rate for either SOEs or private enterprises.

Table 12: Results of ownership heterogeneity analysis on holder and growth

	(1)State-owned enterprise	(2)Privately operated enterprise
Variables	increase rate of business revenue	increase rate of business revenue
Shareholding ratio of the largest shareholder	-0.004	-0.004
	(0.01)	(0.01)
Company size	0.330***	0.247
	(0.06)	(0.16)
Listing period	-0.044**	-0.086*
	(0.02)	(0.05)
Number of management personnel	-0.013	-0.022
	(0.01)	(0.08)
Depreciation and amortization	-0.000	-0.000
	(0.00)	(0.00)
Price-to-book ratio	0.103***	-0.001
	(0.04)	(0.00)
Total shares	-0.000	-0.000*
	(0.00)	(0.00)
Constant	-6.668***	-3.174
	(1.51)	(3.13)
Observations	412	127

Standard errors in parentheses

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

Based on these results, the third and fourth groups of analyses indicate no significance, suggesting that Holder is not a valid measure of corporate performance in ownership heterogeneity analysis. For SOEs, DAR significantly impacts both ROA (negative) and Growth (positive), with the latter effect being more substantial. Thus, SOEs can moderately increase DAR to enhance revenue growth. For private enterprises, DAR has a significant negative impact on ROA but no significant impact on Growth, suggesting that private enterprises should appropriately control DAR to improve corporate performance.

6. Conclusion and recommendations

6.1. Conclusion

Against the backdrop of economic recovery following the pandemic, this study examines the relationship between capital structure and corporate performance using panel data from domestic non-bank financial firms listed from 2015 to 2024. The study incorporates moderation effects, robustness tests, and heterogeneity analyses. The following conclusions are drawn from the fixed-effects model applied to the panel data: Baseline Regression Results: In the baseline regression with fixed effects for individual firms and time, only the debt-to-asset ratio (DAR) as an explanatory variable showed significant results. Specifically, DAR had a significant negative correlation with

return on assets (ROA) and a significant positive correlation with revenue growth rate (Growth). Robustness Test Results: In two robustness tests: (1) changing fixed effects to industry and time; (2) winsorizing continuous variables, DAR remained significantly negatively correlated with ROA but lost its significance for Growth. This may be due to two factors: (1) the significance in the fixed-effects model was only marginal; (2) the robustness tests slightly altered the sample structure, resulting in insignificance. Moderation Effect Results: In the moderation analysis, Balance 5 (BALA5) was the only moderating variable that had a significant effect, specifically on ROA, with a negative coefficient. It did not have a significant effect on Growth. Heterogeneity Analysis Results: In regional heterogeneity analysis: For firms in the eastern region, DAR had a significant negative effect on both ROA and Growth. For firms in the western region, DAR significantly and negatively affected ROA but did not significantly affect Growth. For firms in the central region, DAR had no significant impact on either ROA or Growth. In ownership heterogeneity analysis: Due to sample size limitations, only state-owned enterprises (SOEs) and private enterprises were analyzed. For SOEs, the significance and coefficients of DAR were consistent with the baseline regression (negative for ROA, positive for Growth). For private enterprises, only the effect on ROA was significant, and the coefficient was negative.

6.2. Recommendations

Based on the findings, the following recommendations are proposed: (1) Encourage Investment in Capital Structure: Tax incentives: Provide tax deductions or subsidies for investments in organizational structures, management processes, and technical systems to encourage greater investment in structural capital. Financial support: Establish special funds to support non-bank financial firms in technological innovation and management improvement projects. (2) Strengthen Industry Regulation: Enhance the regulatory framework: Develop standards for structural capital construction specific to the non-bank financial sector to ensure compliance with regulations during development. Increase regulatory transparency: Regularly publish best practices and successful cases of structural capital construction in the industry to facilitate knowledge sharing. (3) Promote Regionally Differentiated Regulatory Policies: Moderately reduce DAR for firms in the eastern and western regions: The government should introduce differentiated financing policies, such as providing low-cost direct financing channels, to encourage firms to reduce their reliance on debt financing through equity financing or other means. Optimize equity structures for eastern firms and reduce the largest shareholder's ownership ratio: Regulatory authorities should encourage equity diversification through measures such as promoting mixed-ownership reforms and optimizing shareholder structures to improve corporate governance transparency and independence. (4) Improve Equity Governance Mechanisms: Moderately increase DAR for SOEs: Policies should guide SOEs to make reasonable use of leverage, encouraging them to increase investments moderately while maintaining stable operations to enhance market competitiveness. Control DAR for private enterprises and optimize capital structure: Strengthen the supervision of private enterprises' debt structures and guide them to adopt diversified financing methods. Reduce over-reliance on debt financing by encouraging alternative methods such as equity financing and private equity funds to optimize the capital structure and improve operational stability.

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