The Impact of Shadow Banking on the Business Operation Risks of Real Enterprises

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Abstract. Under the downward pressure of the global economy, real enterprises, in search of new growth drivers, have successively reduced productive investment and shifted to the financial sector, making the phenomenon of engaging in shadow banking business increasingly common. This paper takes the balance sheet data of Chinese A-share listed real enterprises from 2010 to 2023 as a sample. This period covers economic fluctuations, so the data is representative. A two-way fixed effect model is used for benchmark regression, which can effectively control individual and time differences; the instrumental variable method is applied to test endogeneity to ensure the robustness of the results. The study finds that shadow banking business of real enterprises will push up operational risks. At the same time, the decline in their operating performance and the reduction in real investment efficiency will reversely exacerbate operational risks and play an intermediary role in the relationship between the two. This conclusion provides an important basis for real enterprises to scientifically formulate operational and fund management strategies.

Keywords: Business operation risks, real investment efficiency, operating performance, shadow banking.

1. Introduction

The concept of shadow banking has developed rapidly around the world these years. The phenomenon of ‘financial disintermediation' in the United States during the 1970s created conditions for asset securitization and the emergence of the shadow banking system. At the same time, due to credit constraints on small and medium-sized enterprises, shadow banking filled the gap left by insufficient commercial bank loans, becoming an important route in financing [1]. The core characteristics of shadow banking in real enterprises include: significant financing attributes; high leverage levels; low transaction transparency; space for regulatory arbitrage [2]. Therefore, the rapid development of shadow banking exposes more financial risks at the macro level and triggers illegal activities at the micro level of enterprises. Many companies choose to shift funds from investing in their main business to financial products, affecting the development of their main business and negatively impacting China's high-quality economic development.

In the current background of rapid shadow banking development among real enterprises, investigating the intrinsic factors driving their involvement in shadow banking activities is an effective approach to solving the issue. Most studies in macro-level impact generally believe that while shadow banking promotes financial development, it may also undermine the stability of the financial system and increase its complexity. Extending from this, does shadow banking activity affect corporate operational risk? How do these activities influence mechanisms such as business performance and real investment efficiency? These micro-level issues within enterprises are worth exploring. Conducting relevant research can help enterprises understand the impact of participating in shadow banking activities on capital utilization efficiency, profitability, and risk tolerance, aiding them in formulating scientific business strategies and capital management policies.

Shadow banking exacerbates the problem of asymmetric information. Corporate managers have the ability to exploit their informational advantage for manipulation, making it difficult for investors to accurately assess the true operating conditions of the company, thereby increasing credit default risks [3]. Additionally, the structure of shadow banking is highly prone to causing corporate cash flow disruptions during regulatory tightening or rising market interest rates. Companies may create

an ‘internal shadow banking system' for fund allocation, which lacks external regulatory constraints, leading to the accumulation of risks within the system, which can affect the entire industry ecosystem. Therefore, excessive shadow banking by real enterprises can lead to the hollowing out of the real economy, thus impacting the company's risk tolerance capacity.

H1: Shadow banking by real enterprises increases business operational risks.

As a core component of corporate value creation, real investment drives technological innovation and industrial upgrading through the optimal allocation of production factors. However, during economic downturns, the excess returns of the financial sector relative to the real economy cause some real enterprises to gradually shift their operational focus from real production to shadow banking activities, which reduces the efficiency of real investment. This capital diversion results in insufficient investment in core business operations, weakening long-term competitiveness and thereby increasing business risks.

H2: Shadow banking by real enterprises increases business operation risk by decreasing real investment efficiency.

Excessive involvement in shadow banking by enterprises negatively impacts the operating performance of core businesses. Reduced operating performance may lead to a decrease in total working capital, increasing the risk of a broken capital chain. Furthermore, lower operating performance can affect the company's reputation and brand image, leading to greater competitive pressure in the market. Therefore, operating performance weakens the effect of shadow banking on increasing business operation risks for real enterprises.

H3: Shadow banking by real enterprises increases business operation risk by decreasing operating performance.

2. Research Design

2.1. Variable Definition

Table 1. Definitions and Explanations of Major Variables

Type	Name	Code	Meaning
Explanatory variables	Shadow banking by real enterprises	SB	log(other Current Assets + non-current assets due within one year + other non-current assets + other receivables)
Interpreted variable	Business risk	Z-score	The smaller the index, the higher the risk
Mediating variables	Business performance	PE	Synthesis by principal component analysis
	real investment efficiency	TobinQ	Company market value/asset replacement cost
Control variables	Enterprise size	SIZE	The logarithm of the total assets of the enterprise at the end of the period
	Enterprise age	AGE	The difference between the observation year and the year of listing
	top ten shareholders	Top10	The sum of the shareholding ratios of the top ten shareholders
	leverage ratio	Lev	Total liabilities/total assets
	Board size	Board	The logarithm of the number of board members

This paper selects variables as shown in Table 1. Using Altman's Z-score model to measure business operating risks. To measure the explanatory variable of shadow banking, the logarithmic value is chosen to represent its relative scale to reduce errors. For the mediating variable of corporate operating performance (PE), this paper uses Liu Qianqian's calculation method to combine four aspects of operating performance into a comprehensive index [4]. At the same time, referring to Jin Qinglu's literature, the Tobin's Q ratio (Tobin Q) value is used to measure the investment efficiency

of private enterprises [5]. Finally, five control variables are selected: enterprise size (SIZE), enterprise market age (AGE), shareholding ratio of the top ten shareholders (top10), board size (Board), and debt-to-equity ratio (Lev) [6].

2.2. Sample Selection and Data Sources

The study takes China A-share non-financial listed companies from 2010 to 2023 as the research subjects, with financial data primarily sourced from the financial statements, notes, and financial indicators analysis tables of the China Stock Market & Accounting Research Database (CSMAR). The sample data were strictly screened and processed: (1) excluding financial sector listed company data; (2) removing data from Special Treatment (ST) companies with obvious financial issues; (3) excluding samples with missing values in the research variables; (4) applying upper and lower 1% bilateral winsorization to continuous variables. Data analysis was conducted using Stata 18.0.

2.3. Model Building

This study employs a bidirectional fixed-effects model for empirical research. Based on existing literature, the specific benchmark model of this study is set as follows:

$$Z - score_{it} = \alpha_0 + \alpha_1 \times SB + \beta_1 \times PE + \beta_2 \times TobinQ + \omega \times X_{it} + \lambda_i + \gamma_t + \varepsilon_{it} \quad (1)$$

$Z - score$indicates business risks, where α_0 is the intercept term, α_1 represents the coefficient of the impact of the shadow banking by real enterprises on business operation risks, β_1 and β_2 are the mediator variable coefficients affecting business operation risks respectively, X_{it} represents a series of control variables, λ_i represents company fixed effects, γ_t represents time fixed effects, and ε_{it} is the random disturbance term [7].

2.4. Descriptive Statistics

The descriptive statistical results of the variables in the previous paragraph are shown in Table 2, where the maximum value of Z-score is 419.818, the minimum is -10.268, and the mean is 4.968. This indicates that some companies have poor operating conditions, and there is a significant difference in business risks among enterprises, confirming the broadness and representativeness of the selected research subjects in this paper. The standard deviation of SB is 2.291, and the mean is 18.581, indicating that Chinese real enterprises widely participate in shadow banking activities. From the control variables, the standard deviation of enterprise size (SIZE) is 1.329, while the standard deviation of enterprise age (AGE) is 0.357, suggesting that the distribution of enterprise sizes is relatively wide with significant differences, but relatively small differences in the operational time of enterprises. The standard deviations of the top ten shareholders' shareholding ratio (Top10), board size (Board), and leverage ratio (Lev) are relatively small, indicating less variation.

Table 2. Summary Statistics

VarName	Obs	Mean	SD	Min	Max
Z-score	42850	4.9677	7.593	-10.2675	419.8183
SB	42850	18.5805	2.291	12.6159	23.5287
Size	42850	22.1849	1.329	17.8132	28.6969
Lev	42850	0.4135	0.210	0.0075	1.9566
Age	42850	2.9206	0.357	0.0000	4.1897
Top10	42850	0.5888	0.156	0.0131	1.0116
Board	42850	2.1154	0.200	1.0986	2.8904

These descriptive data all confirm that the data selected in this paper are reliable, helping us to continue further data analysis work. Therefore, based on these data, this paper conducts benchmark regression analysis, endogeneity tests, and mediation effect tests.

3. Result Analysis

3.1. Benchmark Regression Analysis

Table 3 presents the result of the benchmark regression. Column (1) shows that the regression results with fixed effects controlled but without control variables, revealing that the estimated coefficient for real enterprises' shadow banking (SB) is significantly negative at the 5% significance level. Building on this, column (2) further includes control variables, at which point the coefficient for shadow banking by real enterprises remains significantly negative at the 1% significance level, further indicating that real enterprises' shadow banking exacerbates their operational risk. Therefore, Hypothesis 1 is supported.

Regarding the control variables, it can be observed that a larger enterprise scale corresponds to higher operational risk. Equity concentration is negatively correlated with operational risk, and enterprise age (Age) is positively correlated with operational risk at the 1% level. The debt-to-assets ratio (Lev) is significantly negatively correlated with operational risk at the 1% level.

Table 3. Benchmark Regression Analysis

VarName	(1) Z-score	(2) Z-score
SB	-0.068**	-0.153***
	(0.026)	(0.026)
Size		-0.766***
		(0.112)
Lev		-13.657***
		(0.515)
Age		1.432***
		(0.454)
Top10		-2.053***
		(0.438)
Board		-0.458
		(0.354)
Firm	YES	YES
Year	YES	YES
_cons	3.714***	22.768***
	(0.489)	(2.769)
N	42541	42541
R2	0.543	0.581

Standard errors in parentheses
* p < 0.1, ** p < 0.05, *** p < 0.01

3.2. Endogeneity Test

Table 4. Endogeneity Test

VarName	(1) First	(2) Second
IV	-0.346***	
	(0.005)	
SB		-0.200***
		(0.051)
R2	0.142	
F-Statistic	4498.55	
p-value	0.000	

It is still necessary to be vigilant about potential endogeneity, although regression analysis was conducted earlier. There may be a reciprocal causality relationship between the shadow banking by real enterprises and their business operational risks. To exclude the interference of other unobservable omitted variables and other endogeneity issues, this paper uses instrumental variable methods to address them, as shown in Table 4. Specifically, the first-order lagged term of the independent variable is introduced as an instrumental variable for regression analysis.

3.3. Robustness Test

This paper replaces the core explanatory variable and continues to re-regress the entire sample. The result in column (1) of Table 5 indicates that the estimated coefficient of SB1 is significantly negative at the 1% level, suggesting that the shadow banking of real enterprises exacerbates their operational risks, and the core conclusion remains unchanged [8].

To ensure the robustness of the results, this paper also further expands the scope of fixed effects. This paper controls for industry-level fixed effects of enterprises to enhance the interpretative strength of the results, as shown in column (2) of Table 5. The core argument remains unchanged, and the hypothesis still holds [9].

Within the time series interval of the sample data in this paper, there exists a significant external shock event, the Coronavirus Disease 2019 (COVID-19) pandemic in 2020. This paper deletes enterprise samples after 2019. The empirical regression results are shown in column (3) of Table 5, and the core conclusions have not changed.

To further ensure the robustness of the results, this paper further adds other control variables: return on assets (Roa) and dual positions (Dual). The results in column (4) of Table 5 show that the estimated coefficient of SB is significantly negative at the 1% level, once again indicating the robustness of the conclusions in this paper [10].

Table 5. Robustness Test

	(1)	(2)	(3)	(4)
VarName	Z-score	Z-score	Z-score	Z-score
SB1	-0.142***			
	(0.026)			
SB		-0.156***	-0.207***	-0.163***
		(0.027)	(0.041)	(0.026)
Controls	-13.642***	-13.664***	-13.396***	-12.285***
	(0.513)	(0.509)	(0.526)	(0.540)
Roa				6.820***
				(0.646)
Dual				-0.187**
				(0.095)
Firm	YES	YES	YES	YES
Year	YES	YES	YES	YES
Industry	NO	YES	NO	NO
_cons	22.660***	23.119***	38.779***	26.069***
	(2.769)	(2.821)	(4.324)	(2.830)
N	42541	42541	24817	42540
R2	0.581	0.583	0.586	0.583

3.4. Mediation Effect Test

The results of the mediation effect test for real investment efficiency are shown in columns (1) and (2) of Table 6. Column (1) shows that the SB coefficient is -0.016 and is significant at the 5% level, indicating a negative impact of shadow banking on corporate real investment efficiency. From column (2), it can be seen that the regression coefficient of SB is -0.121, and the regression coefficient

of Tobin Q is 2.071, both of which are significant at the 1% level. Additionally, -0.016 × 2.071 has the same negative sign as -0.121, suggesting that the real enterprises' involvement in shadow banking reduces real investment efficiency and thus increases business operating risks. The intermediary effect of business performance is similar to the test of real investment efficiency, as shown in columns (3) and (4) of Table 6, where -0.184 × 0.021 has the same negative sign as -0.151. Therefore, Hypotheses 2 and 3 are both supported.

Table 6. Mediation Effect Test

	(1)	(2)	(3)	(4)
VarName	TobinQ	Z-score	PE	Z-score
SB	-0.016**	-0.121***	-0.184***	-0.151***
	(0.008)	(0.022)	(0.041)	(0.026)
Controls	-0.748***	0.783***	-0.642**	-0.789***
	(0.080)	(0.200)	(0.268)	(0.114)
TobinQ		2.071***		
		(0.328)		
PE				0.021***
				(0.005)
Firm	YES	YES	YES	YES
Year	YES	YES	YES	YES
_cons	15.280***	-8.876**	53.502***	24.225***
	(1.650)	(4.329)	(8.034)	(2.840)
N	42541	42541	41371	41371
R2	0.558	0.670	0.880	0.580

4. Conclusion

This paper based on financial data of A-share listed entities in China from 2010 to 2023, creatively employs a double fixed-effects model and instrumental variable method to systematically examine the impact mechanism of shadow banking on the business operation risks of real enterprises. The research results indicate that the shadow banking activities of real enterprises not only directly increase corporate operational risks but also indirectly exacerbate risk levels by reducing corporate real investment efficiency and business performance. This finding has significant theoretical and practical implications for understanding the current phenomenon of ‘economic detachment from reality' and its risk transmission mechanisms in China.

This study offers important insights from a policy perspective. For real enterprises, it is essential to rationally view the short-term gains and long-term risks associated with shadow banking activities, avoiding the hollowing out of core businesses due to excessive financialization. For regulatory authorities, there is a need to strengthen monitoring and early warning of corporate shadow banking activities, improve the disclosure mechanism of shadow banking information, and prevent the transmission of financial risks to the real economy. Additionally, policies such as tax incentives and financing support should be used to guide capital back into the real economy, reducing the motivation for enterprises to excessively engage in shadow banking activities.

Future research can be extended in the following directions: examining the heterogeneity of the impact of shadow banking on different industries and enterprises with different ownership natures. Analyzing how macroeconomic policy uncertainty moderates the relationship between shadow banking by real enterprises and business operation risks. Finally, it’s valuable to explore new characteristics of corporate financialization behaviors under digitalization and their risk transmission mechanisms. These studies will provide more robust theoretical support and policy basis for promoting high-quality economic development.

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