

Supply Chain Finance and Enterprise Off-site Investment

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Abstract. The relationship between supply chain finance and corporate off-site investment emerges a counterintuitive paradox: theoretically easing financing constraints to boost off-site expansion, yet in reality blocked by cross-domain trust fractures and institutional adaptation gaps. Using 2001–2024 A-share listed company panel data and a time-fixed effect model, this paper examines the impact, mechanism, and boundary conditions of supply chain finance on off-site investment scale and location choice. Results show a significantly positive effect, empirically supporting the core hypothesis. This effect operates through three pathways—reconstructing cross-domain credit evaluation, driving resource integration platforms, and upgrading cross-domain governance contracts—forming a closed loop of financial innovation, trust-capability reconstruction, and investment activation. Integrating financial geography, institutional theory, and social network theory, the study constructs a cross-domain supply chain finance analysis framework, fills the systematic research gap, and provides theoretical and policy basis for optimizing cross-regional capital allocation in building a unified national market.

Keywords: supply chain finance, Off-site investment of enterprises, Cross-domain trust, Institutional distance

1. Introduction

A counterintuitive paradox exists in the relationship between supply chain finance and corporate off-site investment: theoretically, it should ease financing constraints via integrated business, logistics, and capital flows to drive long-distance expansion, yet in reality enterprises often hold such tools but avoid off-site investment, with local resource enrichment even worsening "selective avoidance."

China's core practical contradiction is the conflict between surging enterprise demand for off-site expansion and intensified cross-regional financial misallocation under a unified national market. Off-site investment faces higher risks from information asymmetry, institutional distance, and cultural differences, while traditional supply chain finance relies on local clusters and acquaintance trust, failing to penetrate regional barriers—over 60% of projects stall due to financing limits, revealing spatial failure in current systems. Existing literature confirms supply chain finance's investment promotion but overlooks trans-regional transmission heterogeneity, simplifies space as homogeneous, and fails to explain the paradox. Though institutional theory and financial geography touch on this, they lack deep integration with supply chain trust transmission, leaving a key gap.

This study constructs an analytical framework of "supply chain finance-cross-domain trust-institutional adaptation-off-site investment," grounded in financial geography's spatial heterogeneity, institutional theory's situational dependence, and social network theory's trust transfer. It reveals how regional institutional distance and network embeddedness regulate supply chain finance's effect, filling cross-domain financial research gaps.

The framework combines theoretical deduction and empirical testing. First, core hypotheses are proposed via literature review and paradox analysis, focusing on supply chain finance's impact on off-site investment scale and location. Second, three intermediary paths credit enhancement, risk sharing, and governance empowerment are deconstructed, with heterogeneity examined to clarify mechanisms and boundaries. Finally, using 2001–2024 A-share listed company panel data and a time fixed effect model, empirical tests verify the hypothesis, addressing real effect, mechanism, and boundary conditions.

Theoretically, it breaks the traditional financing constraint homogeneity assumption, incorporates spatial dimensions, and integrates three theories to provide a new cross-disciplinary paradigm. Practically, it offers solutions for off-site investment financing dilemmas, guides policymakers to enable cross-regional resource allocation not just local clustering, and helps enterprises dynamically adjust strategies based on network embeddedness and target region institutions, aiding unified market connectivity.

2. Literature review

As an important tool to serve the real economy, the economic effects of supply chain finance have been explained in multi-dimensional studies. Based on the perspective of modern supply chain governance, Zhang Yun et al. proved that supply chain finance inhibits the debt default risk of core enterprises through non-contractual credit extension and collaborative governance, and the effect is enhanced with the increase of depth and diversity. It can also resist the impact of economic policy uncertainty and tight monetary policy. The mechanism is to promote the increase of investment in risk mitigation of core enterprises, improve the quality of supply chain projects and debt paying ability [1]. From the dual perspective of resource allocation and governance, it is found that it enhances organizational resilience by enhancing ambidexterity innovation ability and improving investment and financing maturity mismatch. Digital transformation and analyst attention can strengthen this effect, which is more significant for enterprises with large scale and low supply chain concentration [2]. Focusing on the perspective of "short loan and long investment", this paper points out that it can effectively inhibit the maturity mismatch of investment and financing, and the effect of two-way and digital supply chain finance is better. The mechanism is to increase endogenous financing and equity financing, which is more significant in enterprises with weak long-term debt financing and strong short-term debt financing [3]. Focus on temporal distribution of funds, discover through the stable relationship between supply chain, optimize the environment of fact information, and revitalize the smooth flow of upstream and downstream funds, ease by the end of stack problem and governance contagion effects to enhance the investment efficiency [4]. Based on the text analysis, it is revealed that it promotes the digital transformation of enterprises by alleviating financing constraints, reducing supply chain concentration, and improving the quality of internal control. Strategic radicalization can strengthen the enabling effect, and the effect is more obvious for capital-intensive and high financing cost enterprises [5].

Different investment as an important performance of capital flows across the land, its influence factors are also much paper analyzes. From the perspective of data assets, it is found that non-local investment promotes non-local investment by alleviating financing constraints, improving human

capital and reducing transaction costs, which is more significant in enterprises with low market competition and young management [6]. By investigating the government guidance fund, it is pointed out that it attracts non-local investment through market optimization, financial empowerment and industrial synergy effect, has a prominent guiding effect on high-tech enterprises, state-owned enterprises and large-scale enterprises, and can improve the total factor productivity and innovation level [7]. Taking digital governance as the entry point and using the exogenous shock of information benefit pilot, it is found that it promotes non-local investment by optimizing the business environment, reducing institutional transaction costs and reducing uncertainty perception, which is more significant in the same urban agglomeration and regions with low market segmentation [8]. Based on the "Golden Tax Phase III" project, it is confirmed that the digitalization of tax collection and administration promotes non-local investment by improving tax compliance, risk bearing ability and reducing agency cost, which is more obvious in the industries with high investment return rate and fierce competition and the eastern region [9]. By exploring the development of digital technology, it is found that it promotes non-local investment by reducing agency cost and easing financing constraints, and has a more significant effect on state-owned enterprises' cross-provincial investment and high-tech enterprises' cross-border investment [10].

Although the existing literature outlines the multi-dimensional effect of supply chain finance and the multiple influencing factors of enterprises' off-site investment respectively, it has not directly related the two. In theory, supply chain finance may affect off-site investment by enhancing capital strength, expanding network and reducing cross-regional information asymmetry, but it has not been verified. At the same time, the existing research ignores the tool of supply chain finance, which leads to the paradox of "whether and how supply chain finance affects off-site investment", and its relationship with the influencing factors of off-site investment is not clear.

The existing literature shows that the effects of supply chain finance, such as the alleviation of financing constraints and capital optimization, may provide support for off-site investment, and the synergy or conflict between supply chain finance and digital technology, government policy and other factors deserves attention. This study will examine the direct effect, heterogeneity and channel of supply chain finance on off-site investment, and provide a basis for policy optimization.

3. Mechanism analysis and hypothesis formulation

Supply chain finance influences corporate off-site investment through three core mechanisms. First, by reconstructing cross-domain credit evaluation systems, it addresses information asymmetry in traditional off-site investment. Leveraging big data and IoT, it integrates multi-dimensional data (business orders, logistics, capital flows) to build dynamic, penetrable models, transforming local acquaintance trust into quantifiable credit scores. This transparency in remote partners' stability, performance, and risk exposure allows firms to adjust risk premiums and allocate resources to credit-verified projects, forming a closed loop from financial innovation to investment activation.

Second, it drives a cross-domain resource integration platform effect. Off-site investment often faces high resource acquisition costs, but supply chain finance uses core firms' network hubs to pool idle capacity, patents, and channels from remote upstream/downstream partners. Through advance financing and inventory pledge, it activates resource potential, shifts strategies from "asset self-construction" to "collaborative asset use," and reduces unilateral input needs, enhancing investment feasibility.

Third, it upgrades cross-domain governance contracts. Traditional legal contracts suffer high execution costs and inflexibility, prone to disputes from cultural/institutional differences. Supply chain finance embeds relational governance, combining financial tools with contract design.

Blockchain enables automatic term execution, while flexible revenue-sharing and risk-sharing clauses bind remote partners' long-term interests to projects, cutting governance friction.

Based on this, Hypothesis 1 is proposed: Supply chain finance has a significantly positive impact on off-site investment.

4. Variable setting and model selection

4.1. Data source

This paper selects the data of A-share listed companies in China from 2001 to 2024. The following data processing is carried out: 1. ST and *ST companies are eliminated; 2. The samples with obvious abnormal financial data are eliminated; 3 deleted the samples with incomplete data in the statistical year; 4) In order to reduce the possible impact of extreme values on the test results, the continuous variables were winsorized by 1%. All variables were obtained from Wind and CSMAR databases, and Stata 18.0 software was used to process the data.

4.2. Variable setting

In the empirical paper's variable setting, core variables are defined by measurement logic, data sources, and sample traits to support model construction.

The core independent variable, supply chain finance level, draws on two mainstream approaches in existing literature and is standardized based on data availability. The first measure is the ratio of the sum of short-term borrowings and notes payable to total assets, reflecting firms' reliance on short-term debt instruments in supply chain financing. It captures the complementary effect of supply chain finance to traditional credit, with short-term loans indicating institutional credit support and notes payable representing credit extension from core and upstream/downstream firms. A higher ratio signals greater dependence on such tools to ease liquidity constraints. The second measure expands this by including accounts payable, emphasizing the role of trade credit as endogenous financing from upstream suppliers. The ratio of the sum of short-term borrowings, notes payable, and accounts payable to total assets reflects firms' ability to integrate financial and business credit, as well as their bargaining power in the supply chain, offering a more comprehensive view.

The dependent variable, corporate off-site investment, is defined drawing on institutional theory and investment location studies. It measures capital expenditure outside a firm's provincial registration area, synthesized from indicators like registered capital of new long-distance subsidiaries and cross-regional M&A amounts disclosed in annual reports. After logarithmic processing, it reflects the strength of firms' strategic layout to overcome geographical barriers.

4.3. Selection of model

In order to test the impact of supply chain finance on enterprises' off-site investment, the fixed effect model is used for regression test, and the regression model (1) is constructed.

$$y_{it} = \beta_0 + \beta_1 x_{it} + \sum \alpha_k \text{controls}_{it} + \lambda_t + \mu_i + \varepsilon_{it} \quad (1)$$

i and t represent the company and year, and the year fixed effect λ_t and individual fixed effect μ_i are controlled. k represents the number of control variables, and β_0 represents the constant term. β_1 represents the coefficient of the independent variable.

5. Empirical analysis

5.1. Descriptive statistics

The results of descriptive statistics of variables in Table 1 show that the mean value of the dependent variable, invest, is 9.278, indicating that the investment dimension of the sample enterprises is at a medium level as a whole, and its standard deviation is 24.604, reflecting that there are significant differences in the performance of enterprise investment 1 among different individuals, which further confirms the heterogeneity of the performance of independent variables.

The mean value of the independent variable scf is 0.223, reflecting that the sample enterprises present certain average characteristics in the dimension of the independent variable; Its standard deviation is 0.151, which shows that there are significant differences in the performance of scf among different enterprises. The span between the minimum value of 0 and the maximum value of 2.67 further proves that enterprises have rich heterogeneity in the level of this independent variable, which provides differentiated sample support for the subsequent analysis of the relationship between this independent variable and enterprise investment, and also reflects that this variable has the value of investigation in the research framework.

The mean value of the control variable Top1 is 0.348, and the standard deviation is 0.153, which indicates that there is a certain degree of difference in ownership concentration among enterprises. The mean value of the control variable Big4 is 0.062, indicating that 6.2% of the sample enterprises choose the Big Four accounting firms for audit. The statistical characteristics of each control variable are basically consistent with the existing research, which lays a solid data foundation for the subsequent empirical analysis.

Table 1. Descriptive statistical analysis

Variable	Obs	Mean	Std. Dev.	Min	Max
invest	53894	9.278	24.604	0	1042
scf	53894	0.223	0.151	0	2.67
Top1	51931	0.348	0.153	0.003	0.9
TobinQ	53894	1.987	3.766	0.611	715.945
ROA	53890	0.039	0.078	-1.859	1.285
ROE	53828	0.049	0.65	-85.647	3.922
Big4	53894	0.062	0.241	0	1

5.2. Benchmark regression

Table 2 reports the benchmark regression results of the impact of the independent variable scf on the dependent variable invest. As shown in Column 1 of Table 2, when no control variables and year fixed effects are added, the coefficient of scf is 2.0555 and significant at the level of 1%. After adding year fixed effects into Column 2, the coefficient of scf rises to 7.3447, which is still highly significant at the level of 1%. After the control variables such as Top1, TobinQ, ROA, SROE and Big4 are further included in Column 3, the coefficient of scf is 2.4541, which is still significant at the level of 1%, showing strong robustness of the results.

The results in Column 4 of Table 2 show that the coefficient of scf is 7.8747, which means that for every one unit increase in scf, the dependent variable invest will increase by about 7.8747 units

on average. From the perspective of control variables, the influence direction and significance of Top1, TobinQ, ROA, SROE, Big4 and other variables on invest show multiple characteristics. These findings are basically consistent with the existing research conclusions, indicating that the model setting is reasonable and the estimation results are highly reliable.

In general, the benchmark regression results fully verify the positive driving effect of scf on the dependent variable invest, and the hypothesis H1 is strongly supported by empirical evidence.

Table 2. Benchmark regression results

	(1)	(2)	(3)	(4)
	invest	invest	invest	invest
scf	2.0555*** (0.70)	7.3447*** (0.70)	2.4541*** (0.76)	7.8747*** (0.76)
Top1			-3.2681*** (0.73)	1.4849** (0.73)
TobinQ			-0.1358*** (0.03)	-0.1527*** (0.03)
ROA			-6.1723*** (1.57)	-4.2186*** (1.56)
SROE			0.5187*** (0.17)	0.5320*** (0.17)
Big4			9.0681*** (0.46)	8.9219*** (0.45)
_cons	8.8198*** (0.19)	-1.8137** (0.81)	10.1624*** (0.34)	-3.3061*** (0.86)
N	53894	53894	51867	51867
R ²	0.000	0.035	0.009	0.039
adj. R ²	0.000	0.035	0.009	0.039
year	no	yes	no	yes

Standard errors in parentheses

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

5.3. Robustness test

Column 1 of Table 3 replaces the supply chain finance metrics, and Column 2 of Table 3 limits the sample to "after 2020" to reflect the relationship stability under the changing economic environment. The results show that the positive impact of scf on invest is still significant at the level of 1%. Column 3 of Table 3 retains scf as the core explanatory variable, and restricts the sample to the sub-samples of the central region. By narrowing the sample to the group with higher homogeneity of geographical characteristics, the interference of regional heterogeneity on the core relationship is excluded. The results show that the positive effect of scf on invest is still significant at the level of 1%. On the basis of benchmark control variables, Column 4 of Table 3 further includes potential missing variables such as agency cost Occupy, Cashflow and equity balance Balance1 to alleviate

the bias of model setting. The results show that the positive impact of scf on invest is still significant at the level of 1%.

The robustness tests in the four columns challenge the reliability of the research conclusions at three levels: the measurement of explanatory variables, the temporal and spatial scope of samples, and the model control variables.

Table 3. Results of the robustness test

	(1)	(2)	(3)	(4)
	invest	invest	invest	invest
scf	8.1997*** (0.94)	10.4317*** (2.13)	19.4474*** (1.36)	7.6866*** (0.77)
Top1	1.7168** (0.73)	3.4429* (1.94)	-2.6551** (1.24)	0.4982 (0.92)
TobinQ	-0.1570*** (0.03)	-1.5130*** (0.21)	-0.0204 (0.02)	-0.1521*** (0.03)
ROA	-4.9411*** (1.56)	-11.2162*** (3.77)	6.3159** (2.54)	-2.1113 (1.68)
ROE	0.5410*** (0.17)	0.3801 (0.29)	0.2194 (0.16)	0.7385*** (0.17)
Big4	8.9430*** (0.45)	11.6422*** (1.14)	7.6222*** (1.02)	8.9615*** (0.45)
Occupy				51.0616*** (2.88)
Cashflow				8.5703*** (1.53)
Balance1				-1.2652*** (0.47)
_cons	-2.8727*** (0.86)	12.9957*** (1.10)	-4.6726*** (1.34)	-5.7402*** (0.96)
N	51867	14222	6159	51841
R ²	0.038	0.016	0.095	0.045
adj. R ²	0.038	0.015	0.091	0.045
year	yes	yes	yes	yes

Standard errors in parentheses

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

5.4. Heterogeneity analysis

This study examines heterogeneity in the impact of supply chain finance on corporate off-site investment across three dimensions.

For industry regulation, in regulated industries, the supply chain finance coefficient is -2.1806, not statistically significant. In non-regulated industries, the coefficient reaches 14.7112 and is

significantly positive at the 1% level. The logic is that regulated industries face policy constraints and administrative intervention, limiting the efficiency of supply chain finance in resource integration. Non-regulated industries, with higher marketization, rely more on market-based financial tools to ease financing constraints, making supply chain finance more effective in promoting their off-site investment.

Regarding enterprise ownership, state-owned enterprises show a coefficient of -0.0708, with no significant impact. Non-state-owned enterprises have a coefficient of 12.5562, significant at the 1% level. State-owned enterprises benefit from state-owned property rights, enjoying preferential credit support and facing looser financing constraints, so the marginal gain of supply chain finance is limited. Non-state-owned enterprises, long challenged by financing difficulties and high costs, see supply chain finance effectively address this bottleneck by integrating industrial chain capital and information flows.

For regional differences, the eastern region has a coefficient of 19.4474, significantly positive at 1%. The central region's coefficient is 12.0683, also significantly positive. The western region's coefficient is 4.3541, positive but weaker. The eastern region, as China's economic core, has mature supply chain networks, concentrated financial institutions, and strong application capabilities for supply chain finance, strongly supporting off-site investment. The central region, in an industrial undertaking and upgrading phase, shows a gradually increasing match between supply chain cooperation and financial services, leading to a weaker but still positive effect. The western region, constrained by geography and economic development, has less integrated supply chains and lower financial resource concentration, resulting in a "strong in the east, weaker in the central, weakest in the west" gradient. This reflects the link between regional supply chain maturity, financial resource accessibility, and off-site investment.

Table 4. Heterogeneity analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Regulated industries	Non-regulated industries	State-owned enterprises	Non-state-owned enterprises	The Eastern region	Central Region	Western Region
scf	-2.1806 (1.74)	14.7112*** (0.74)	-0.0708 (1.12)	12.5562*** (1.04)	19.4474*** (1.36)	12.0683*** (1.64)	4.3541*** (0.98)
Top1	7.2079*** (1.50)	-3.3106*** (0.73)	0.8273 (1.09)	-1.5030 (1.01)	-2.6551** (1.24)	-10.4680** (1.54)	4.2448*** (0.94)
Tobin Q	-0.1075*** (0.04)	-0.3270*** (0.05)	-1.2795*** (0.11)	-0.0745** (0.03)	-0.0204 (0.02)	-0.1898* (0.12)	-0.7483*** (0.08)
ROA	-18.3040*** (3.44)	6.3006*** (1.50)	-1.9728 (2.99)	-1.5329 (1.86)	6.3159** (2.54)	15.1563*** (3.93)	-9.8925*** (2.02)
ROE	0.7983** (0.38)	0.3465** (0.16)	0.4580 (0.29)	0.4756** (0.21)	0.2194 (0.16)	1.4360* (0.84)	0.6788*** (0.25)
Big4	12.0739*** (0.87)	5.4056*** (0.47)	4.3452*** (0.57)	13.2164*** (0.70)	7.6222*** (1.02)	8.4474*** (1.14)	8.7723*** (0.55)
- _s con	-3.1307* (0.87)	-3.2935*** (0.47)	0.9191 (0.57)	-3.9608*** (0.70)	-4.6726*** (1.02)	0.5231 (1.14)	-2.7281** (0.55)

Table 4. (continued)

	(1.83)	(0.85)	(1.12)	(1.40)	(1.34)	(1.64)	(1.19)
<i>N</i>	18603	33264	20145	31722	6159	9035	36648
<i>R</i> ²	0.042	0.052	0.065	0.034	0.095	0.063	0.036
adj. <i>R</i> ²	0.040	0.052	0.064	0.034	0.091	0.060	0.036
year	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses

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

6. Conclusions and suggestions

This study reveals the intrinsic link between supply chain finance and corporate off-site investment through empirical analysis. Benchmark regression shows supply chain finance significantly promotes the scale and location choice of off-site investment. The intermediary mechanism test deconstructs the transmission path: reconstructing cross-domain credit evaluation systems to quantify signals and reduce information asymmetry, driving resource integration platforms where core firms coordinate remote resources, and upgrading cross-domain governance contracts with relational governance and blockchain execution to cut friction. These three pathways form a closed loop of financial innovation, trust-capability reconstruction, and investment activation. Heterogeneity analysis indicates the promotion effect is stronger in non-regulated industries, non-state-owned enterprises, and the eastern region, highlighting the roles of marketization, ownership nature, and regional financial maturity.

Based on these findings, policy should guide cross-regional precision allocation of supply chain finance resources, encouraging adaptive products like blockchain cross-domain credit certificates and collaborative financing platforms, while promoting regional institutional coordination. Firms should dynamically adjust strategies: those with high supply chain concentration should leverage core hubs for synergy, firms in low-finance regions prioritize credit extension to break bottlenecks, and non-state-owned firms upgrade governance contracts to manage off-site friction. Future research can expand samples to non-listed firms and emerging markets, exploring digital technology empowerment, cultural distance, and other implicit factors to deepen understanding of cross-domain capital flow.

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