

Supply Chain Finance Risks under Heterogeneous Market Structures: A Comparative Analysis of Monopoly, Oligopoly and Competitive Markets

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Abstract. Supply chain finance (SCF) has become an important financing mechanism for improving liquidity and supporting small and medium-sized enterprises. Existing research mainly focuses on credit risk, operational risk and digital financial technology, while paying limited attention to the role of market structure in shaping supply chain financial risks. This article explores how different market structures affect financing availability, liquidity pressure and risk transmission by comparing three representative industries - the power grid industry (monopoly), the electric vehicle industry (oligopoly) and the fast fashion industry (competitive market). The study draws on the theory of industrial organization, uses the Herfindahl - Hirschman Index (HHI) to assess market concentration, and employs the Cash Conversion Cycle (CCC) to evaluate working capital efficiency when comparable financial data is available. Research has found that monopolistic industries enjoy stable cash flows and lower financing risks, but they are still vulnerable to concentration risks. Oligopolistic industries demonstrate relatively efficient liquidity management and at the same time transfer financial pressure to suppliers through strong bargaining power. In contrast, suppliers in competitive markets face the greatest financing pressure due to weak bargaining power, long payment cycles and large fluctuations in profitability. This paper holds that market structure indirectly affects supply chain finance risks by influencing the stability of a company's cash flow, its bargaining power and its dependence on suppliers, thereby providing a more comprehensive analytical framework for understanding the heterogeneous financing risks among different industries.

Keywords: market structure, supply chain finance risk, industrial organisation theory

1. Introduction

Supply chain finance (SCF) has gradually been added to the financing tools for modern supply chains and is one of the reasons small and medium-sized enterprises (SMEs) have been unable to obtain loans from traditional banks. SCF does not only evaluate the credit conditions and collateral of the enterprise itself, but also makes use of the financial strength and trade credit of the main enterprise to provide financing support for upstream suppliers and downstream distributors. Financing tools such as accounts receivable financing, reverse factoring and inventory financing

have been used to increase the company's liquidity and promote efficient capital utilisation of the supply chain.

With the expansion of the production network around the world and the development of digital supply chain management, Supply Chain Finance has also spread rapidly. The bank will use the transaction data to work with the main enterprise and the digital platform on financing. Therefore, SCF has been one of the main drivers of corporate financing and industrial development.

SCF has the following risks too. High interdependence means that the financial problems of the company will be transmitted throughout its entire supply chain.

This paper will address the following three problems: (1) How does the concentration of the market affect the financing ability of a company? (2) What are the differences in bargaining power and stability of cash flow under different market structures? (3) How do these differences impact the risk transmission in the supply chain?

2. Comprehensive analysis

2.1. Theoretical framework

Supply chain finance (SCF) refers to a series of financing solutions that optimize working capital by integrating financial institutions and various participants in the supply chain. Unlike traditional loans that are evaluated individually based on the enterprise's own financial statements and collateral, SCF takes into account the business relationships among suppliers, buyers and financial institutions, enabling small businesses to obtain financing by leveraging the stronger credit qualifications of core enterprises [1].

The most widely adopted SCF tools include accounts receivable financing, reverse factoring and inventory financing. Among them, reverse factoring enables suppliers to receive payment in advance at a relatively low financing cost. Meanwhile, financial institutions mainly rely on the credit quality of core buyers rather than the credit of suppliers themselves. Therefore, it has become one of the most effective financing mechanisms.

The economic logic of supply chain finance lies in enhancing the working capital efficiency of enterprises. A commonly used indicator for evaluating liquidity management is the Cash Conversion Cycle (CCC), which measures the length of time from when an enterprise pays cash for production to when it recovers cash from customers [2]. It is calculated as formula (1).

$$CCC = DIO + DSO - DPO \quad (1)$$

Among them, DIO (Days Inventory Outstanding) measures the average number of days that inventory is held before sale; DSO (Days Sales Outstanding) indicates the average number of days required to collect accounts receivable from customers. DPO (Days Payables Outstanding) measures the average time it takes for an enterprise to make payments to its suppliers.

A longer Cash Conversion Cycle means that a company's funds are occupied for a longer period of time in its business operations, thereby increasing liquidity pressure and external financing needs. On the contrary, a shorter CCC indicates more efficient cash flow management and lower financing requirements. As one of the main goals of supply chain finance is to shorten the cash conversion cycle of enterprises by accelerating cash inflows or expanding payment flexibility, CCC provides a useful analytical indicator for assessing the financing needs of different industries. Therefore, this paper takes the Cash Conversion Cycle as one of the key indicators for comparing the liquidity situation in the selected case studies.

Although SCF enhances financing efficiency and working capital management, it also exposes participants to multiple risks [3, 4]. As shown in Table 1.

Table 1. Source of risks and the reasons behind

Source of risk	Reasons for the risk to occur
Credit risk	Such risks occur when borrowers fail to repay loans or when core enterprises fall into financial difficulties. As financial institutions often rely highly on the credit quality of core enterprises, the deterioration of their financial conditions will significantly increase the default risk throughout the entire supply chain.
Liquidity risk	Enterprises are facing cash flow shortages due to delayed payments, declining sales or sudden economic shocks. Suppliers with limited financial reserves are particularly vulnerable as they typically rely on continuous external financing to maintain their daily operations.
Operational risk	Enterprises are facing cash flow shortages due to delayed payments, declining sales or sudden economic shocks. Suppliers with limited financial reserves are particularly vulnerable as they typically rely on continuous external financing to maintain their daily operations.
Contagion risk	This is one of the defining features of supply chain finance. As enterprises are interrelated through contractual relationships and financial transactions, disturbances affecting a certain participant may rapidly spread to suppliers, distributors and financial institutions [5]. This network effect makes risk management much more complicated than traditional corporate loans.

2.2. The impact of market structure

As discussed in the previous section, supply chain finance primarily aims to improve firms' liquidity and working capital management. However, firms' financing needs are not determined solely by internal financial decisions. They are also shaped by the competitive environment in which firms operate. According to industrial organisation theory, different market structures generate varying levels of market concentration, pricing power and bargaining power [6], which ultimately influence firms' cash-flow stability and financing capability.

2.2.1. Monopoly market: electricity grid industry

The power transmission industry is a typical natural monopoly industry, which stems from its extremely high infrastructure costs and extensive government regulation. State Grid Corporation of China provides electricity services to over 1.1 billion people in 26 provinces and delivers more than 60% of the country's electricity consumption [7]. Therefore, the HHI of this industry is close to 10,000, indicating that it is almost a pure monopoly.

The monopolistic structure brings several financial advantages. Stable customer demand and regulated pricing have generated highly predictable operating cash flow, enabling State Grid to maintain a strong credit rating and relatively low financing costs. Therefore, suppliers can often obtain financing based on the credit status of the core enterprise rather than their own financial performance.

However, the high degree of market concentration has also led to a reliance on a single buyer. Although individual financing risks are relatively low, suppliers are highly exposed to regulatory changes or operational disruption risks that could affect the leading enterprise.

2.2.2. Oligopoly market: electric vehicle industry

The global battery electric vehicle (BEV) industry demonstrates the characteristics of a typical oligopoly. Tesla and BYD together accounted for approximately 23.8% of global BEV sales during the first half of 2026, while the five largest manufacturers controlled over one-third of the global market. The industry's estimated HHI of approximately 800 to 1200, reflecting moderate concentration with several dominant firms possessing significant market power [8].

Compared with monopoly industries, competition among leading EV manufacturers stimulates technological innovation while preserving considerable bargaining power over suppliers. Financial data further illustrate these characteristics. Tesla maintains an estimated Cash Conversion Cycle (CCC) of approximately 5 days, reflecting efficient working capital management and relatively balanced payment policies. In contrast, BYD exhibits an estimated negative CCC of approximately -39 days, largely due to its extended accounts payable period of around 128 days. A negative CCC indicates that BYD is able to finance part of its operations using supplier credit, effectively transferring liquidity pressure upstream.

These examples demonstrate that although suppliers benefit from the strong credit quality of dominant manufacturers, they also become increasingly dependent on a small number of buyers, making supply chain financing vulnerable to pricing strategies and demand fluctuations implemented by core enterprises.

2.2.3. Competitive market: fast fashion industry

The fast fashion industry is a highly competitive market, characterized by low entry barriers, a large number of manufacturers and fierce price competition. Take SHEIN's supply chain as an example. Its production is distributed among thousands of independent suppliers, and the estimated HHI is far below 1,500, which conforms to the characteristics of a highly fragmented market.

Unlike enterprises in monopolistic or oligopolistic markets, fast fashion suppliers usually have very limited bargaining power. Although SHEIN's small-batch, fast-response production model has shortened inventory turnover time, suppliers often face longer payment cycles, which may exceed 120 days, while the industry average is close to 166 days. Coupled with extremely meager profit margins, these conditions have led to persistent liquidity pressure and a heavy reliance on external financing.

Therefore, suppliers in competitive industries face the greatest financing difficulties even with the relatively low market concentration, as longer payment cycles and weak pricing power significantly increase their working capital requirements.

Overall, these three typical industries demonstrate that the market structure shapes the financial environment of enterprises in fundamentally different ways. Monopolistic industries benefit from stable cash flows, oligopolistic industries have strong bargaining power, while competitive industries are facing continuous liquidity pressure. These differences lay the foundation for understanding the supply chain finance risks of heterogeneity among different industries.

2.3. Mechanisms linking market structure to supply chain finance risk

The comparative evidence presented above suggests that market structure does not directly determine supply chain finance risk. Instead, it influences firms' financial characteristics through three interconnected mechanisms, which are cash-flow stability, bargaining power and supplier dependence. Together, these mechanisms can explain why financing risks differ substantially across industries.

2.3.1. Cash flow stability

The first mechanism involves the stability of an enterprise's operating cash flow. Enterprises in monopolistic markets usually benefit from stable demand and predictable income, enabling them to maintain a strong credit standing and lower financing costs. This is evident in the power grid industry. The regulated business model of State Grid has generated a highly stable operating cash flow, although the profit margin is relatively low.

In contrast, leading enterprises in the electric vehicle industry also maintain a healthy liquidity situation, despite the greater profit fluctuations caused by competitive pressure. Tesla's Cash Conversion Cycle is approximately 5 days, reflecting efficient working capital management. In contrast, BYD's CCC is negative (-39 days), demonstrating its stronger ability to finance operations through supplier credit. In contrast, suppliers in the fast fashion industry have limited financial buffers and longer payment cycles, resulting in significantly lower cash flow stability.

These differences indicate that more stable operating cash flow reduces the financing needs of enterprises and enhances their debt-paying ability, thereby lowering the risks of supply chain finance.

2.3.2. Bargaining power

The second mechanism involves the bargaining power between the core enterprise and its suppliers. Greater market forces enable leading enterprises to negotiate more favorable payment terms, enhancing their own liquidity while shifting financing pressure upstream.

The comparison between Tesla and BYD clearly illustrates this mechanism. Although both enterprises belong to oligopolistic industries, BYD's significantly longer payment Cycle enables it to maintain a negative Cash Conversion Cycle, effectively using supplier funds to finance its operations. Similarly, suppliers in SHEIN's supply chain often accept longer payment cycles due to their relatively weak bargaining position and the presence of a large number of competing manufacturers.

Therefore, stronger bargaining power has improved the financial situation of core enterprises, but it has also increased suppliers' reliance on supply chain finance.

2.3.3. Supplier dependence and risk contagion

The last mechanism involves the transmission of supplier dependence and financial risks. In highly concentrated markets, a considerable proportion of a supplier's sales often rely on a few core enterprises. This kind of dependence is conducive to financing under normal circumstances because financial institutions have considerable confidence in the credit quality of leading enterprises.

However, an excessively high concentration also increases systemic risks [9]. In monopolistic industries such as power transmission, suppliers are highly dependent on a single leading enterprise.

In an oligopolistic market, fluctuations in demand, technological changes or aggressive pricing strategies of Tesla or BYD may rapidly affect their upstream suppliers. In contrast, suppliers in competitive markets typically serve a more diverse customer base, reducing the risk of concentration. However, due to fierce competition and weak profitability, the probability of their individual financial difficulties is much higher.

Overall, these three mechanisms indicate that market structure indirectly affects supply chain financial risks through the stability of a company's cash flow, its bargaining power and its dependence on suppliers. The market structure does not directly determine the financing outcome but rather shapes the financial environment in which supply chain participants are located, thereby influencing the availability of financing [10], the probability of default, and the transmission of financial risks within the supply chain [11].

3. Conclusion

According to the theory of industrial organisation and comparative case studies, this paper investigates how various market structures affect supply chain finance risk. This study believes that the market structure is an essential element of a firm's financial environment and not simply a risk that will occur in light of poor financial health, as is the case with supply chain finance risk.

Based on the above evidence, monopolistic industries generally have stable cash flow, a good credit rating and relatively low financing costs; however, due to the concentrated nature of these industries, there is still a high dependence on one or a few leading enterprises. Oligopolistic industries have relatively good financing conditions for suppliers due to the good credit of the leading enterprise. The leading company will extend its payment term and therefore increases the need for external funds by suppliers. Due to the market competition, the distributed industry structure, weak bargaining power and small profit margins have led to continuous liquidity shortages, and therefore suppliers are the most vulnerable link in the supply chain finance.

Based on the research results, the structure of the market affects a company's supply chain financial risk indirectly by changing the company's profitability, cash flow stability and bargaining power; therefore, it will affect the availability of funds, default risk and shock transmission. In conjunction with the concentration index HHI and the working capital indicator CCC, this paper will build an analytical system to investigate the reasons for different levels of risk in industries. In the future, many empirical studies will need to be conducted using panel data from various industries to quantify these correlations.

This paper has provided a certain organisation for studying the relationship between market structure and Supply chain finance risk, but there are still some defects. First, the analysis will be mainly in the form of concepts and will use three representative industries as case studies. Although these cases can show the theoretical mechanism, there are no systematic empirical tests and thus the research results are not generalisable. Second, the index for industry concentration and the indicator of cash conversion cycle (CCC) in this paper are used as proxies for market concentration and working capital efficiency, respectively. The above aggregated indicators may fail to show the different circumstances of the enterprises in terms of financing behaviour, risk tolerance and the use of digital financial platforms. Thirdly, the analysis of the market structure is static and does not consider changes in the market over time; for instance, government policies, new technologies and changes in competition can all increase or decrease the transmission of risk.

In light of the problems mentioned above, future studies will use panel data from various industries and areas of enterprises to conduct empirical verification. Over the long term, how changes in the concentration of the market affect SCF risk will be studied during times of economic

downturn. Additionally, comparing the institutions in different regions, for example, developed countries and developing countries, can also help us understand how regulatory systems and financial systems are altered when changes in the structure of the market and SCF risk occur. Finally, by adding micro financial data on the payment behaviour of individual enterprises, credit ratings and actual use of SCF tools, this research will be able to gain a deeper understanding of the mechanisms identified in this paper. The results of this experiment will provide new ideas for the future and help improve the supply chain.

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