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Analysis of E-commerce Platform Supply Chain Finance Model - Taking JD Group as an Example

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Abstract. This paper makes an in-depth analysis of the supply chain finance model of e-commerce platform, taking Jingdong Group as a case study, and discusses its development process, main financing mode and advantages and disadvantages. By defining the concept of supply chain finance and electricity supply chain finance, combined with the theory of transaction cost and long tail, this paper explores the jingdong gold enterprise cooperation financing mode (including order loan, warehouse receipt pledge, accounts receivable and entrusted loans) and platform of proprietary financing mode (such as Beijing bao bei, Beijing small loan, enterprise gold and chattel financing). Through the comparison with the supply chain finance model of Ping An Bank and Alibaba Group, it reveals JD’s unique characteristics in its strategic positioning, participants and financing services. The article points out that fintech has promoted the innovation of supply chain finance, and JD's supply chain finance model has significant promotion value, and provides suggestions on improving the payment system, increasing policy support, expanding the source of funds and improving the regulatory mechanism, so as to further optimize the supply chain finance services of the e-commerce platform.

Keywords: E-commerce platform, supply chain finance, model, Jingdong Group

1. Introduction

Supply chain finance(SCF) is a model based on core companies, joint banking business and small enterprises to establish a complete industrial chain, using advanced information technology means to comprehensively process the data of suppliers, producers, sellers and consumers[1] . Through SCF,large companies can assist downstream small businesses to reduce potential risks while providing them with credit support[2] . This includes various types of services, such as payment settlement, lending, business process monitoring, financial planning and so on. In addition, large enterprises can spread their own economic risks while providing credit support to smaller businesses, facilitating financial inclusion and enhancing overall supply chain efficiency.

In recent years, JD's e-commerce platform has achieved rapid development and successfully entered the leading echelon of China's e-commerce industry. Based on the enterprise transaction information and big data technology of its e-commerce platform, JD has optimized and simplified the loan process, achieved higher efficiency and convenience, and significantly reduced related costs[3]. This paper aims to discuss in detail the financial enterprise cooperative financing mode and platform proprietary financing mode of JD, and analyze how fintech promotes the innovation of supply chain finance. The findings underscore that JD's supply chain finance model has significant promotion value.

2. Introduction of the supply chain finance model of JD group

2.1. Development course of JD supply chain finance

Founded in 1998 by CEO Liu Qiangdong in Beijing, JD initially operated in various fields, including commercial sales and technological innovation. As one of the largest e-commerce brands in China, as shown in Figure 1, it covers a wide range of products and services, including but not limited to online shopping malls, Internet payment solutions, and express delivery systems.

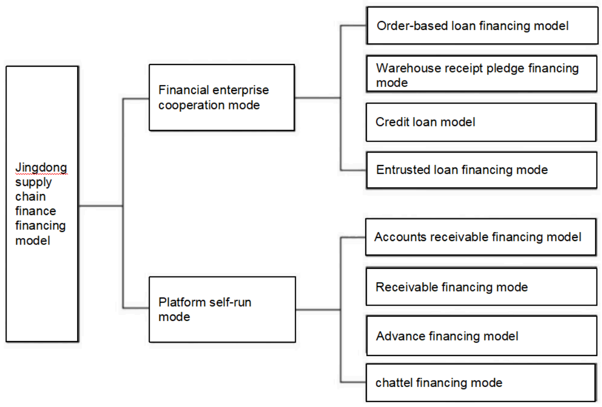

Figure 1: Schematic diagram of JD's supply chain finance model

In recent years, JD's e-commerce platform has grown rapidly and has become the first camp in China's e-commerce industry. Simultaneously, it has deeply arranged the Internet financial market and built a supply chain system with the characteristics of JD. Supply chain finance is the leading business of JD Technology Company in commercial finance, covering the integration of capital flow, information transmission and cargo transportation[4]. The specific business progress is shown in Figure 2:

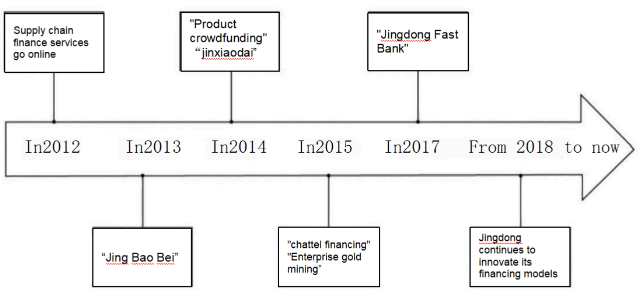

Figure 2: Development process of JD supply chain finance business

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2.2. Cooperative financing mode of financial enterprises

The method of financial collaboration and integration refers to the joint actions of financial institutions and e-commerce platforms aimed at assisting the development of e-commerce platforms and optimizing the financial service system within the e-commerce chain. Figure 3 shows the components of JD Finance's cooperation strategy, where JD Corporation collaborates with banking services to develop new financial products and services[5] .By utilizing transaction records within JD Mall, they review the credit needs of businesses, which not only effectively reduces risks but also significantly increases the speed of approval. Based on precise data calculations, an objective evaluation of credit risks for businesses throughout the supply chain is conducted, and the results are transmitted in real-time to the banking system, allowing small and micro enterprises to obtain funding support more quickly. Specific steps of this operational method can be referenced in the diagram.

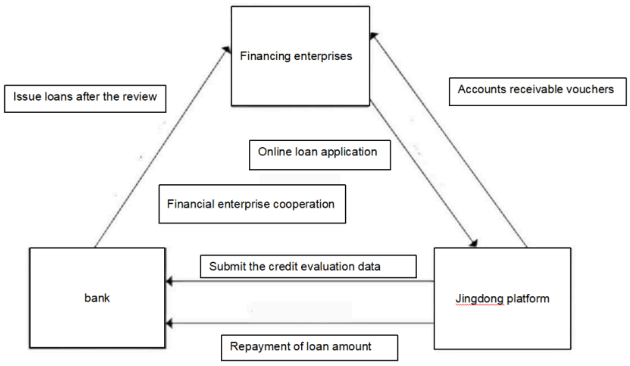

Figure 3: Operation process of the enterprise cooperation mode

2.3. Platform self-financing mode

The capital of this financing method comes from the e-commerce platform[6] . In the initial stage, it was mainly financed through Beijing small loan and bank lending, but as the business model was gradually reformed, with new financing modes such as chattel financing and prepaid financing being launched, the financing process was greatly simplified. The following sections will introduce the relevant financing services in detail.

2.3.1. Financing receivable mode — Jingbaobei

In December 2013, JD Technology, a subsidiary of JD, released a product called "Jingbaobei". This is a factoring financing service for suppliers in the supply chain, designed to help them cope with the challenge of limited financing access and the long time required to obtain the loan. This financing approach, initiated by JD using its own capital, represents an innovative model in supply chain finance.

With the help of big data technology, JD collects and sorts out the information of various parts of the supply chain, such as purchasing raw materials, sales and inventory management. By building the data center, it automatically generates credit lines according to the cooperative relationship between JD and its enterprises[7] . The release of this product fills in the shortcomings of the financing efficiency of the traditional supply chain finance business, and its rapid approval process

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and simple operation mode surpasses the traditional banking business in related fields. Figure 4 reveals the details of the operation mode:

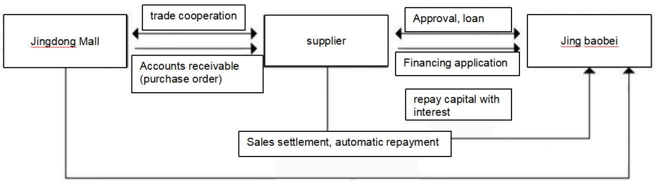

Figure 4: "Jingbao Bei" model flowchart

2.3.2. Credit loan model - Jing Xiaodai

After launching "Jingbao Bei", JD introduced "Jing Xiaodai" to help small businesses quickly obtain financing. The product includes order loans and credit assessment loans. Order loans are based on transaction data between merchants and JD.com, with a maximum loan amount of four million yuan. Credit assessment loans determine the maximum loan limit of one million eight hundred thousand RMB based on data such as business operations, transaction volume, and sales performance through big data analysis. The advantage of "Jing Xiaodai" is that it does not require documentation, and only a credit score is needed to obtain the loan, meeting the needs of different businesses. After applying, the system approves instantly, and online operations are flexible and convenient. As shown in Figure 5, the specific operational steps are as follows:

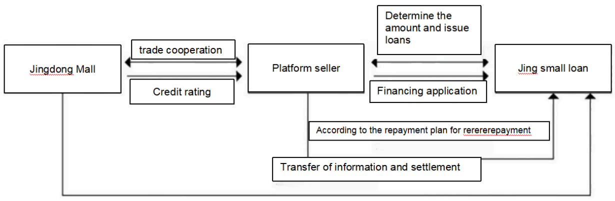

Figure 5: Flowchart of "Beijing Xiaodai" mode

2.3.3. Prepaid financing mode — enterprise gold acquisition

JD provides credit and financial management solutions for commercial members, known as "corporate financial mining". The plan allows enterprise users to enjoy a "buy before pay" service after buying goods on the JD shopping platform, and sets a credit limit. The enterprise gold purchase combines the traditional transaction mode of consumption before payment and the loan service, provides credit purchase and installment repayment, and pays the account management fee. The enterprise can borrow money on a regular basis based on the order quantity, need to repay the principal due, and postpone the additional fee. The settlement period can be one week or one month, the bill period is adjustable, the longest interest-free period is 21 days, and the lowest interest rate installment period is 90 days. See Table 1:

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Table 1: Fee standard of "enterprise gold acquisition" [official website of JD Finance]

Method of settliing Accounts	Week Knot	Monthly Statement
Bill day	Every Monday	The 1st of each month
Interest-free period	The maximum is 21 days	No preferential policies
The final repayment period	fortnight	The 20th of each week
Funds make advance payment for the service fee	0	0.6%
Delay service fee	0.05% / day (30 days)	
penalty	0.08% / day (more than 30 days overdue)	

2.3.4. Chattel financing mode

Taking advantage of the supply chain of its e-commerce platform, JD has launched a product line with chattel financing as the core, integrated shopping mall, logistics, technology and financial resources, and provided online chattel financing solutions. The product helps to ease the financial pressure caused by the merchant inventory backlog, and solve the problem of cargo preparation during large events. Through the cooperation with the warehouse distribution enterprises, the project uses the commodity evaluation model to value the pledged goods, and deeply participates in each stage of the product, forming a huge information network. This enables JD to quickly detect and prevent any false transactions, effectively reduce risks, and realize real-time pledge.

This method offers the advantages of a higher credit limit (up to 100 million yuan), rapid loan issuance, a lower interest rate (2.3 per 10,000 per day) and the number of days, and also allows for early repayment without any surcharge. This approach allows merchants to obtain large amounts of borrowing in a relatively safe way, which has a key impact on the growth of the company. See Figure 6:

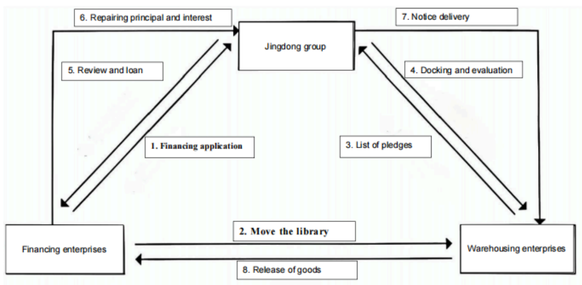

Figure 6: "Chattel financing" model flowchart

3. Comparative analysis of supply chain financial models of JD group

3.1. Analysis of online supply chain financial models of ping an bank and Alibaba

3.1.1. Analysis of online supply chain financial model of ping an bank

Shenzhen is the headquarters of Ping An Bank, which was originally Shenzhen Development Bank, and is the first publicly listed national joint-stock bank in China. Adhering to the concept of "financial services for the people's livelihood", Ping An Bank has developed over years into a joint-stock commercial bank with a full range of financial services, branches nationwide, mature management, stable operations, and a strong brand influence, with unique competitiveness and obvious operational characteristics in the fields of technology, comprehensive finance, and retail transformation.

The online supply chain financial products of Ping An Bank mainly include prepayment financing, inventory financing, reverse factoring, and electronic warehouse receipt pledge, etc. This article mainly explore the prepayment and inventory supply chain financial models.

Prepayment Supply Chain Financial Model

In this model, Ping An Bank has joined forces with the core companies of the supply chain, third-party logistics service providers, and small, medium, and micro enterprises up and down the chain to build this system. Within this framework, all parties can share information with each other, clearly define data, easily perform tasks, and can view the issuance and repayment of loans in real-time, as well as obtain related information such as the progress of goods transportation, thereby providing financial assistance to small and medium-sized enterprises.

This approach can more effectively connect various participants in the supply chain financial environment and simplify the complex processes of multiple participants. At the same time, through information links, banks can monitor the financial status of collateral goods in real-time, thereby helping banks manage credit risks.

Inventory Supply Chain Financial Model

This model is based on Ping An Bank and cooperates with warehousing companies, with the participation of core enterprises, to support small and medium-sized enterprises up and down the supply chain. The model uses the inventory of small and medium-sized enterprises as collateral to provide financing services for them. First, small and medium-sized enterprises in the supply chain apply for pledge to the bank, and Ping An Bank evaluates the collateral through third-party logistics (warehousing) companies to determine the loan amount, with the third-party logistics (warehousing) companies responsible for the custody of the collateral, and the core enterprise repurchases the goods after the financing is over. After the logistics (warehousing) company receives the goods, it notifies the bank, and the bank confirms and grants the loan after confirmation. This model addresses the challenge faced by small and medium-sized enterprises that lack movable property or high-value assets as collateral. By leveraging inventory and products in production, businesses can obtain credit limits, enhance liquidity, and facilitate inventory turnover, ultimately improving overall operational efficiency.

3.1.2. Analysis of online supply chain financial model of Alibaba group

Taobao (Tmall) Credit Loan

The credit service of Taobao (Tmall) under Alibaba mainly aims at merchants using the platform, providing them with loan funds to meet their operational needs and promotion activities. The amount of this loan is based on various factors such as the merchant's credit rating, overall business performance (such as evaluation scores, real-time scores, etc.), and past performance in fulfilling contracts. One of its major advantages is fast approval and rapid disbursement. The specific application steps can be referenced in figure 7:

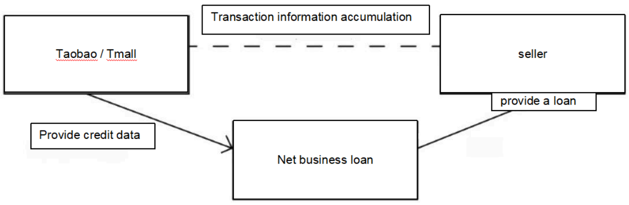

Figure 7: Specific process of credit loan on Taobao (Tmall)

The specific classification of credit loans of Taobao (Tmall) is shown in Table 2 below:

Table 2: Taobao (Tmall) credit loan classification

	3-month short-term loans	Borrowing and repaying within 6 months	12 months of equivalent principal
Credit period:	three months	six months	12 Months
Interest calculation method:	Interest per day	Interest per day	Interest per day
lending rate:	0.05% / day	0.06% / day	0.06% / day
Repayment method:	Automatic repayment of the system	With borrow with return	Monthly repayment of the principal and interest

Taobao (Tmall) order loans allow merchants to use the customer prepayment as a guarantee to obtain financing. After the merchant applies, the platform provides the loan and deducthe principal and interest after the sales collection. The loan is valid for a maximum of 60 days, and the daily interest rate is 50000 after the customer confirms the receipt of the goods. After the customer confirms the receipt of the goods, the system automatically repays. This solution is especially suitable for large-scale promotions to help merchants manage their cash flow.

3.2. Comparative analysis of the supply chain finance mode of JD group

Typical online supply chain finance companies such as JD, Ping An Bank and Alibaba all use e-commerce platforms as their main channels to conduct such businesses[7]. These enterprises have made use of big data technology and emerging fintech means to realize the comprehensive management of trade information, so as to reduce the risks in the sales process of financing enterprises. However, JD and Ping An Bank (a commercial bank), and Alibaba Group differ in many contrast items. The following table shows the differences between the three factors in table3 :

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Table 3: Comparison of the characteristics of supply chain finance models of different models

Contrast item	Jingdong group	Ping An Bank	Alibaba Group
sources of date	The plat form accumulates customer information from wide sources	Dataand information sources are limited	The platform accumulates customer information from wide sources
lending resources	Bank, its own funds	bank	funds in the hands of the localities
Participate in the main body	E-commerce platform, small and medium-sized enterprises Industry, logistics company, banks	Banks, small and medium-sized enterprises Industry, logistics company, core enterprise	E-commerce enterprises, small and medium-sized enterprises
Credit method	Asset guarantee type, credit score type	Financial statement type, capital Production guarantee type	Asset guarantee type, credit score type
Financing object	Platform upstream and downstream enterprises	Small and medium-sized enterprises	Platform upstream and downstream enterprises
Financing amount	more	large	large
Financing efficiency	The lending speed is fast	The loan speed is general	The lending speed is fast
financial charges	Commonly	high	commonly

3.2.1. Strategic aspects

Ping An Bank, leveraging its commercial banking foundation, has a robust fund management and credit evaluation system, which promotes the development of supply chain finance. In contrast, e-commerce platforms like JD.com and Alibaba utilize their extensive social recognition and large customer base to ensure the accuracy of information through real orders and transaction records, making the review process more efficient with faster loan issuance and lower costs, thus making it suitable for the financing needs of small and micro enterprises.

3.2.2. Participants aspects

JD.com's supply chain finance is mainly composed of its e-commerce network, subsidiaries, small and micro enterprises, and logistics companies. JD.com, as the core entity, uses its own capital to grant credit limits to small businesses. Ping An Bank's supply chain finance includes banks, leading enterprises, freight companies, and small enterprises, while without e-commerce involvement. Alibaba has sufficient funds to support supply chain finance without the need for bank assistance, and its logistics advantages increase the diversity of participants.

3.2.3. Financing services aspects

JD.com and Alibaba use the advantages of big data to build accurate credit evaluation systems, covering more borrowers and providing targeted services. JD.com offers larger loans to meet the needs of medium-sized enterprises, while Ping An Bank and Alibaba mainly serve small and micro financing projects. JD.com and Alibaba have fast approval and lending processes, which are beneficial to enterprises in urgent need of funds, but Ping An Bank has higher interest costs.

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3.2.4. Advantages and disadvantages of JD.com's supply chain finance model

JD.com's supply chain finance is recognized for its efficiency, convenience, and low cost. Leveraging the transaction information and big data technology of the e-commerce platform, JD.com has optimized the loan process, simplified borrowing procedures, making credit review more rapid and effective, and saving on labor costs. In addition, JD.com has an independent logistics platform, which allows it to provide supply chain financial products centered on inventory, meeting the credit needs of small and micro enterprises or merchants. The information exchange in the logistics industry also speeds up the approval process and alleviates the financial pressure on enterprises. While Alibaba has a presence in the express delivery business, JD.com's logistics advantages remain significant.

However, despite the advantages, JD.com's supply chain finance model also has certain drawbacks.First, JD.com's platform payment system is not well-developed. Specifically, JD.com's early payment functions were limited by strategy and found it difficult to compete with Ant Financial. Although it promotes third-party payments, its late entry has resulted in a smaller market share. Alipay and WeChat Pay are widespread, and payment habits have formed, making it harder for JD.com to attract customers. Transaction data is important for Alipay's loan services, and JD Finance is therefore affected. In the future, JD.com needs to strengthen its payment strategy to enhance competitiveness and meet market challenges.

Second, JD.com receives less support from national banking services, which may cause consumers to turn to traditional banks' supply chain financial services due to insufficient preferential policies and discounts offered to customers. Third, JD.com also has a limited source of platform funds. Since JD.com mainly relies on bank partner loans to support its supply chain finance, as of June 2018, it had obtained a credit limit of 47.457 billion yuan and paid over 100 million yuan in interest expenses, increasing operational burdens[8]. With the expansion of financial products and business areas, financial pressure intensifies. JD.com's financial debt ratio has reached over 90%, posing potential risks. Despite capital reserves, JD.com, like other small loan institutions in China, faces difficulties in fundraising and needs to rely on its own fundsCompared with Alibaba, JD.com's own funds are insufficient, especially when the demand for financing from small and medium-sized enterprises is high, facing greater financial pressure.

Finally, JD.com's regulatory mechanisms are underdeveloped, and there is a shortage of talent. In the current financial field, the supply chain financial services provided by e-commerce platforms have become a growing area of research. However, due to the lack of a complete system of relevant policies and regulations, enterprises lack corresponding normative constraints and policy guidance in this field[9]. E-commerce enterprises represented by JD.com urgently need to deeply optimize their management systems to meet the challenges of the continuous development of supply chain financial services. Compared with traditional banking services, supply chain financial services pay more attention to the complexity of cross-enterprise cooperation and the in-depth understanding of professional fields, which covers legal, financial, and logistics management, among other professional skills. Currently, there is an urgent demand in the market for compound talents with such interdisciplinary knowledge backgrounds, but the supply of such talents is relatively scarce. Therefore, efforts should be made to strengthen the recruitment and cultivation of these talents[10].

4. Conclusion

This study mainly focuses on the analysis of the supply chain financial model of e-commerce platforms and takes JD.com's supply chain finance as an example for discussion. The main research

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findings include: the supply chain financial model is superior to traditional services in terms of credit review, coverage, loan amount, and issuance speed, and is more adaptable to the capital needs of small and medium-sized enterprises. The new model simplifies the financing process, reduces costs and cycles, and improves risk management. These advancements benefit from the development of e-commerce and related technologies, financial technology innovations and the reform of traditional financial formats.

JD.com's supply chain finance relies on its e-commerce network developed since 2012, expanding from platform merchant credit evaluation to "movable property financing" of the non-platform real economy. Its financing costs are low, approvals are fast, and risk control utilizes data technology. Given that logistics is one of JD.com’s core strengths, its e-commerce supply chain financial strategy has significant potential for broader application. However, facing credit system and regulatory issues, it is necessary to improve technological means to optimize services. While Alibaba has a competitive edge in the payment field, JD.com needs to improve the third-party payment system, strengthen collaboration and resource integration, avoid excessive concentration, reduce cooperation obstacles, and enhance efficiency. At the same time, increase consumer discounts, expand market share.

This study also provides practical recommendations based on real-world conditions. The government can support the industry by offering incentives such as tax reductions or financial assistance and collaborating with financial institutions to establish a support system that enhances the operational capabilities and risk resistance of e-commerce enterprises. It is necessary to address the imbalance in information acquisition and build an innovative financial service network to promote industry collaborative progress. Mobilize social forces to create an industry mutual support system, promoting balanced development.

The income of JD.com Group's small loan company comes from interest, which is affected by various factors. To cope with cash pressure, the company may need to seek external financing through borrowing or equity expansion to enhance liquidity.. Long-term strategies include developing new business models and funding methods, and raising funds through various means to activate the circulation of supply chain funds, expand service areas, strengthen the negotiation power of core enterprises and supply chain management capabilities, indirectly enhancing risk control capabilities. Expanding financing channels helps optimize supply chain efficiency and build a more sound financial system.

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