

# Managing Online Supply Chain finance Credit Risk of “Asymmetric Information”

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**Abstract**—There are several influential risks in an online supply chain finance(Online SCF) which credit risk is one of the most significant types. Many researchers believe that the impact of credit risks is more considerable than other risks. There are one main reason for online SCF credit risks, which is “asymmetric information”. The article explains aspects of the cause as well as related solutions for it.

The main solutions for the credit risks including: standardization of online supply chain financial processes,establishing credit risk evaluation system using big data etc. Technology,establishing the punishment mechanism of network information disclosure,integrating block chain and online SCF.

Accordingly, since block chain as a new technology, it has an inestimable effect on breaking the bottleneck of the existed means to ease or even eliminate the credit risks on Online SCF.The further study of block chain and online SCF needs to be done in the future.

**Index Terms**—Asymmetric information, Block chain, Credit risk management, Online Supply Chain finance

## I. INTRODUCTION

Credit risk is usually considered as one of the main aspect of online SCF risk. Abundance of subjects participating in online SCF has increased probability of its occurrence. The paper tries illuminating its aspects and presents solutions for its significant cause of online supply chain credit risk:“asymmetric information”. The solutions are from the perspective of the whole supply chain. In addition, the solutions about the mitigation of credit risk take the different stages (before and after the loan) into consideration.

## II. LITERATURE REVIEW

### A. The Risk in Online SCF

Online SCF is a new trend and advanced stage of supply chain finance (SCF), Which is between finance and entity industry based on supply chain management, through the method of information cooperation, including e-commerce transactions, online payment, trade financing , logistics management and many other procedures. It’s a kind of complex financial products.<sup>[1]</sup>The innovation of online SCF lies in the use of network technology to change the definition and operation mode of risk management. But there are still worries behind the “credit creation”.

Some of the risks are more influential in online SCF.And

there are three steps on risk management of online SCF are as follows:

1. Risk identification: there are four main risks on online SCF founded by analyzing the business processes of online SCF, which are credit risks, market risks, operational risks,and legal risks.<sup>[2]</sup>

Credit risk: credit issue, moral hazard;

Market risk: industrial risk, business risk;

Operational risk: risks on pre-loan investigation, loan audit, after-loan management which including IT bugs;

Legal risk: the law on online SCF haven’t been perfect.

2. Risk assessment: Barsky & Catanach<sup>[3]</sup> points out that the SCF risk management concept should build the risk assessment model including five factors, which are business processes, macro environment, information control, human resource as well as the basic structure.It means that it should be considered comprehensively when evaluating risks.

Credit risk: credit evaluation is usually use grading method, which builds the index system from multiple angles including the supply chain power, the borrowing enterprise strength, electronic credit conditions, and scores by the experts in credit department as the basic foundation for enterprises to borrow money.<sup>[4]</sup>

Market risk: evaluating the industry of the loan enterprises involved in periodically, combining with the factors of national policy, industry performance, and so on.

Operational risk: establishing key risk evaluation index system based on four stages of the trading, using the real-time evaluation model on online SCF operational risk assessment.

Legal risk: controlling from national macro regulation.<sup>[5]</sup>

3.Risk control: controlling from five aspects including the strict access requirements, clearing responsibilities definition, improving the operations level, strengthening monitoring warning, perfecting the compensation mechanism<sup>[6]</sup>.

The represented framework could be efficient for mentioned risks and its preventive strategies.

### B. Online SCF Credit Risk of “asymmetric information”

Compared with the loan enterprises on traditional finance, the small and medium-sized enterprises(SME) who get the loan from the financial institutes based on the B2B are smaller, more opaque financial situation, which makes the online B2B financing of small and medium-sized enterprises’ credit risk increase.<sup>[7]</sup>According to Aberdeen's survey on February 2013, in each of the 5 transactions, the risk of goods storage and transportation happens average of 2.84 times, but the credit risks’ happen has reached a total of 3.69 times.<sup>[8]</sup>It means that the credit risk is one of the most crucial risk which impacts online SCF.

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The credit risk of online SCF refers to part or all of funds which borrowed by the SME can't be returned in time, due to the impact of the customer's own environmental factors or other factors, during the customer enterprise financing process. Thus, it brings losses to financial service providers, that is producing the corresponding credit risk. The supply chain financial services provides the relationship between the party and its clients can be viewed as a principal-agent relationship, supply chain financial services provider in the principal position, and financing is agent, the information asymmetry exists.<sup>[9][10]</sup>

Below are the related causes for “asymmetric information” on Online SCF.

### III. THE CAUSES AND RESULTS FOR “ASYMMETRIC INFORMATION” ON ONLINE SCF

Compared with the traditional SCF, Online SCF transfers its audit mode from investigating the individual loan enterprises' credit and repayment ability to controlling the entire supply chain transaction process, which alleviates the symptoms of “asymmetric information” to some extent.<sup>[11]</sup> But financial institutions judges the credibility of the participants no longer through the financial indexes, but by core enterprises' credit, in which the initial credit is not reliable due to reasons such as information asymmetry.

And because online enterprises is various, enterprises from all walks of life converging to it, it is destined to the headquarters of the regional dispersion, and it also greatly increases the difficulty of financial institutions' visit. On the other hand, relative to the offline, online financing enterprises are mostly small enterprises. Their financing amount wouldn't very high, and these enterprises have the features of small scale, imperfect financial, industry dispersion, etc. Those features increases the difficulty of access to information when during credit investigation, and reduces the stability of the supply chain, greatly increases the risk of the default.

The principal-agent relationship is the relationship between the market participants in information superiority and in the information disadvantage. From the perspective of economics, when the information asymmetry of market participants exists, its economic relations can be considered as a principal-agent relationship. There is an agency problem caused by information asymmetry in the principal-agent relationship: the moral hazard problem, namely the credit risk problem. Moral hazard occurs under a type of information asymmetry where the risk-taking party to a transaction knows more about its intentions than the party paying the consequences of the risk.

There are two main reasons for moral hazard. Firstly, on online SCF, financial institutions in general use the model of "main body credit"+"electronic credit" to the credit of the borrowing enterprise. In operation, if financial institutions pay too much emphasis on "electronic credit", just to pursuit the convenience, fast, it is likely that the lack of credit will increase the moral hazard faced by the financial institutions. Such as: borrowing enterprises through false trading, forged financial statement data, abnormal way to enhance the level of site membership and other financial institutions to defraud

loans; the fraud to financial institutions by the combination of loan enterprises and logistics enterprises, etc.; Secondly, violation of the loan agreement, funds for unauthorized alteration, is also a form of moral hazard. The credit risk caused by information asymmetry in the actual online frequently appears in the performance of a supply chain.

### IV. HELPFUL HINTS MITIGATION AND PREVENTIVE STRATEGIES FOR ONLINE SCF CREDIT RISK

#### A. *Standardization of process*

Standardization of online SCF process, and perfecting the legal laws and regulations. It can relieve its credit risks. Thus, to complete the online SCF business at a lower cost and in a more efficient way, producing more services bonus.

#### B. *Establishing the credit risk evaluation system*

The establishment of the credit risk evaluation system, making full use of technology of big data, etc. This is a way to ease the credit risk before the loan .

Financial institutions fully considers the establishment of the credit risk evaluation system. It not only includes the loan enterprise itself, but also the industry development condition, the condition of the core cooperation enterprise, supply chain strength, the electronic credit level and other factors. So as to alleviate the problem of the information asymmetry between with customers.

What's more, with the coming of the era of big data, some e-commerce platform, like Alibaba, has a strong corporate transactions and evaluation database. It's really helpful to make a preliminary judgment on the authenticity of the customer's information and credit conditions, through a rigorous screening process using the customer's transaction records and other information left on the electronic commerce website. Using the technology of big data provides strong credit analysis support for reference, so as to reduce the information asymmetry between the online SCF participants.

#### C. *Establishing network information disclosure mechanism of punishment*

Establishing a network information disclosure mechanism of punishment, is the maximum cost to the loan enterprises if they didn't obey the contract. This is a way to eliminate the credit risk after the loan.

To implement the "network information disclosure mechanism", is to release the basic information and its default situation of the supply chain members on the E-commerce platform, like Alibaba, Taobao, and other websites. Borrowers' default loans information can also be retrieved by the search engine, automatic alert the searcher. Network information disclosure also can be seen as a kind of social constraints, it cut off the default enterprises' relationship between the old and the new, so that the default enterprises will suffer a lot and hard to continue to foothold in the industry. "Online Kill" can make the default cost is much higher than that of the subject owes the loan and interest of the loan itself. It makes the best of the effect of "credit" in the mode of online SCF.

#### D. *The use of chain blocks*

Due to China's credit reporting system is not yet

completed, financial institutions can only credit based on the condition of core enterprises instead of the SME itself. It caused severe information asymmetry between the parties on the supply chain. However, block chain is essentially a perfect mathematical solution to the construction of credit mechanism<sup>[12]</sup>, it's a breakthrough for solving online SCF credit risk.

Block chain technology is built on a specific computer networks and distributed accounting system on the basis of consensus mechanism, and is a basic global credit agreement established based on cryptography algorithm. The American representatives of people's bank of China, Song Xiangyan, Huang Shan said that block chain is an open distributed books system popularly speaking<sup>[13]</sup>. It has the characteristics of historical records can not be changed, decentralization, traceability, and has great advantages in rebuilding the credit mechanism, reducing transaction cost and making up the insufficiency of financial function, which make the block chain to be suit very much for financial transactions as an auxiliary tool<sup>[14][15]</sup>.

In practice, 42 global financial institutions has joined the chain block alliance R3 CEV. Moreover, China Ping'an Insurance also announced officially joined in May 2016. R3 CEV will develop distributed books experiments working with the involved 11 Banks, using proprietary network real-time financial transactions in the whole world, without any centralized third party. Also some scholars proposed the B2B+B2C supply chain each transaction the subject transaction structure diagram and the dynamic multi-center collaborative authentication model based on block chain<sup>[16]</sup>.

Due to the function of block chain, which is that it can transaction data openly, consistently, authentic verification, and can't be tampered with in the reality, financial institutions are better able to control risks, greatly reduce the cost of operation and rebuild credit systems. It's really helpful for solving the problem of "asymmetric information". Therefore, integrating block chain technology into online SCF is really a new area which is worth studying.

## V. CONCLUSION

The credit risk in online SCF has several causes. The paper tries to mention one crucial parts of it which are "asymmetric information". Additionally, related causes and results for it, like moral hazard, were brought. It is hoped that the research could be instrumental and practical for researchers engaged in this field for considering and realizing their various objectives.

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