

# Transformation Mechanism of Supply Chain Micro and Small Enterprises in the Context of the Internet

Yushen Xiang<sup>1, a</sup>

<sup>1</sup>School of Economics, Dalian University of Finance and Economics, Dalian, 116622, China

<sup>a</sup>FisherBigBig@163.com

**Abstract:** The development of intelligent manufacturing has significantly impacted the traditional manufacturing industry, so it is urgent to change the traditional business model and production mode. As the world economy is in a downturn, small and micro enterprises in the subordinate position of the supply chain are facing a considerable threat. On the one hand, the substitutability is substantial; there is no bargaining power, which makes the enterprise's anti-risk ability 0. On the other hand, it is subject to significant restrictions, and the core enterprise thunder will protect all of the enterprises in the chain. This paper focuses on the risk identification and transformation mechanism of micro and small enterprises and whether micro and small enterprises have the conditions for transformation and upgrading in the context of the Internet. Based on the Bayesian formula, the AHP method model is the theoretical basis to help enterprises make decisions.

**Keywords:** Supply chain, Micro and small enterprises, Internet, Transformation and upgrading, Conditions.

## 1. Introductory

Since the reform and opening up, China's economy has realized the development from quantity to quality. The industrial system has been developed relatively completely, but in recent years by the new crown epidemic, the world economic downturn, the loss of population macro-advantage, and other factors, resulting in a sharp decline in product demand, product profitability decline, and other issues, making manufacturing enterprises suffer huge losses, especially in the supply chain vulnerable groups of small and medium-sized enterprises in a particularly difficult position, and Due to the news channels are closed, enterprises do not specialize in their risk identification system, resulting in micro and small enterprises are difficult to predict the future of the industry environment in advance, difficult to prepare in advance for the exit of the enterprise transformation, can only be forced to "skinny dipping." Coupled with the poor credit of micro and small enterprises, commercial banks for the release of the loan amount is low, making the transformation of micro and small enterprises even more difficult. As an important part of China's business system, MSMEs contribute 80% of employment, more than 60% of GDP, and more than 50% of tax revenue, and their role cannot be ignored. Therefore, how to help supply chain micro and small enterprises establish a risk identification system, as well as the current Internet era context, whether it provides the necessary conditions for the transformation and upgrading of micro and small enterprises, and how to utilize the Internet to promote the Internet enterprises to live better, is a key issue that needs to be resolved in the process of China's economic development.

## 2. Literature Review

Currently, there are many research results on supply chain enterprise risk identification. The prerequisites for identification and prediction are 1. Qualitative screening and top beam screening: Qualitative screening is mainly carried out through the intellectual incentive method, listed group

decision-making, and the expert method. According to the degree of differentiation and relevance, the screening needs to be followed: i. Contribute to the identification of credit risk ii. The overlap of the information between the indicators in the same system is as low as possible, using the Lasso-logistic model to identify the key indicators affecting the credit risk of micro, small, and medium-sized enterprises (MSMEs) and model estimation, prediction, and comparison. [1]

Ma Lei believes that in the process of strategic transformation of enterprises, traditional enterprises should give full consideration to the integration of the Internet thinking mode into the enterprise transformation strategy, make full use of Internet technology and resources, adjust the internal environment of the enterprise to adapt to the development of the times, and give full play to their advantages. [2]

## 3. Establishment of a Risk Identification System

### 3.1. Bayesian network

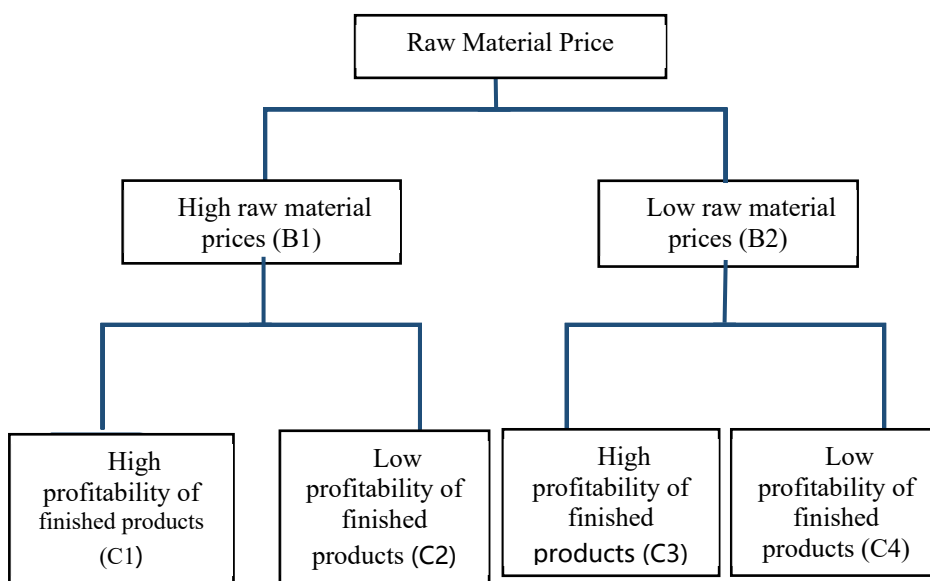
(1) Selected content: The manufacturing industry is the most important link in the supply chain enterprises; we select the ferrous metal smelting and rolling processing industry enterprises inside the manufacturing enterprises as an example: the enterprise is usually private small and micro-enterprises, processing ferrous metals such as iron and steel, cast iron and other ferrous metals. Usually, as the upper end of the supply chain, it is the most basic industry of modern industry, and iron ore is his important raw material.

(2) Raw material data source: Select the highest and lowest values of the spot price of iron ore on the Grand Stock Exchange for each month from 2020/01-2023/07, average them, and finally calculate the average mean value for the period, assuming that the two decimal places are retained as 888.23, when the raw material price is more significant than 888.23 as the raw material price is high, and vice versa.

(3) Industry profit source: With the China Statistical Yearbook 2022 as the data source, in 2021, China's ferrous metal ore mining industry private industrial enterprises were

1,108, with a total profit of 30.9 billion yuan, and the average profit of the enterprise was 26,186,440.678 yuan. Then, when

the profit is more significant than 26,186,440.68 yuan, it is a high profit, less than is low.



**Figure 1.** Probability of raw material prices and product profits

(4) The probability of high profitability of the enterprise's finished product, according to Figure 1:

$(C1+C2)/B1 * C1$  = probability of high profitability of the finished product under conditions of high raw material prices

$(C1+C2)/B1 * C2$  = probability of low profitability of the finished product under conditions of high raw material prices

$(C3+C4)/B2 * C3$  = probability of high profitability of the finished product under conditions of low raw material prices

$(C3+C4)/B2 * C4$  = probability of low profitability of the finished product conditional on low raw material results

According to the substitution calculation, it can be learned only under the condition of low price of raw materials, the

probability of high profit of the finished product is the largest, and the conclusion and the reality of the situation is consistent with the establishment.

(5) Calculation of the expected rate of return of the enterprise

Calculate the expected rate of return of the firm based on the data derived above.

$$E(R) = \sum P_i \times R_i \quad (1)$$

**Table 1.** Enterprise Score Table

Level 1 indicators	Weight $A_i$	Secondary indicators	Weights $B_i$	Indicator score
Basic qualities (A1)	0.46	Industry experience (B1)	0.32	14
		Managerial competencies (B2)	0.31	14
		Years of business establishment (B3)	0.17	8
		Staff size (B4)	0.11	5
		Staff quality (B5)	0.08	4
Financial indicators (A2)	0.22	Accounts receivable turnover (B6)	0.25	6
		Inventory turnover (B7)	0.25	6
		Cash flow liability ratio (B8)	0.15	3
		The growth rate of cash flows from economic activities (B9)	0.14	3
		Gearing ratio (B10)	0.09	2
		Return on net assets (B11)	0.07	2
		Sales margin (B12)	0.05	1
Industry environment (A3)	0.2	Industry sentiment (B13)	0.67	13
		Industry status (B14)	0.33	7
Development potential (A4)	0.12	Investment in technology research and development (B15)	0.52	6
		Sales revenue growth rate (B16)	0.24	3
		Operating profit growth rate (B17)	0.15	2
		Growth rate of net assets (B18)	0.09	1

### 3.2. AHP method model

According table 1, the model to determine the ability of enterprises to repay the risk and the existence of non-performing loans, it can be assumed that it is the survival time of the enterprise; if the higher the score is on behalf of the enterprise has no apparent risk, survival time tends to be infinite, if the score is lower than 70 points means that the enterprise has a more significant business risk, the survival of the length of time is short. [3]

$$Z = 0.46A1+0.22A2+0.2A3+0.12A4 \quad (2)$$

### 3.3. Criteria for judging

Expected rate of return judgment method:  $E(R) \geq 1.75\%$ , 1.75% is China's five central state-owned banks each year regular interest rates because the enterprise needs to invest in the production process of capital costs and can not be diverted, so that this part of the same with the bank time deposits, and because the risk of bank deposits is ultimately less than the risk of business operations, so if it is less than the bank's one-year fixed-term earnings, the enterprise needs to consider the transformation of the Upgrade.

Enterprise default risk determination.

**Table 2.** Enterprise rating

score (of student's work)	hierarchy	An explanation of the meaning of words or phrases
90~100	A	Excellent credit profile with a very low risk of default
80~89	A	Good credit standing and low risk of default
70~79	B	Average creditworthiness and risk of default
60~69	C	Poor creditworthiness and high risk of default
$\leq 59$	C-	Very poor creditworthiness and high risk of default

According table 2, when firm  $C \leq 70$  is in, the bankruptcy interval.

### 3.4. Assigning values, modeling

The risk identification system is divided into two parts, the first is the calculation of the enterprise's future expected rate of return, the part focuses on the enterprise's future profitability, while the other part focuses on the risks faced by the enterprise nowadays, whether it can be operated for a long period, focusing on the enterprise to stay alive and the project discussed in this paper is based on the micro and small enterprises, which are mostly in the start-up stage. The uncertainty of the future is strong, and the competition in the industry is strong.

So, the primary purpose of this type of business is to survive. We choose to assign a weight of 0.7, and profitability is the primary purpose of the business; its role is unavoidable, so we choose to assign a weight of 0.3 to establish the whole risk identification system.

$$0.7 * 70 + 0.3 * 1.75\% \leq 0.7 * C + 0.3 * E(R)$$

## 4. Whether today's Internet Context Is Conducive to Business Transformation

### 4.1. Financial support

In today's highly developed Internet, we utilize the resources of the Internet to enhance our efficiency and enrich the source of funds, getting rid of past problems such as difficulty in getting a loan and long process. Such as the emergence of online net loans, which helped us in a very short period, access to sources of funds to solve the enterprise's sudden capital chain break and transformation, and upgrading of the required financial support. Up to now, under the high-pressure policy of the state, the online lending market has been greatly changed from the past management chaos involving illegal lending and other issues, the number of enterprises shrinking, the formal lending process, as well as the year-on-year increase in the number of transactions, proving that the market is still very dynamic. It is in the period

of the world economic downturn, and the external environment is not in a stable stage. To stimulate economic development, the state, in the reduction of interest rates reserves, the market will be further developed, and China's economy will play a role that can not be ignored.

Zhaolian consumer finance: China Unicom's 2023 semi-annual report disclosed the results of the first half of the operating income of 9.366 billion yuan, an increase of 11.28% year-on-year, as of June 30, the financial assets of 173.240 billion yuan, liabilities of 154.611 billion yuan.

Ant Consumer Finance, Ningde Times 2023, recognized an investment gain or loss of 44,198,000 yuan Consumer Finance during the reporting period, and Ant Consumer Finance's net profit in the first half of 2023 was about 1.28 billion yuan, an increase of about 175% year-on-year.

Jianxin Consumer Finance: On August 23, Construction Bank released its 2023 half-year report, disclosing the operation of Jianxin Consumer Finance. As of the end of June, Jianxin Consumer Finance had total assets of 7.383 billion yuan and net assets of 7.198 billion yuan; the net loss in the year's first half was 0.02 billion yuan.

Sunshine Consumer Finance: Everbright Bank Announces 2023 Semi-Annual Report Sunshine Consumer Finance has total assets of 11.449 billion yuan and net assets of 1.249 billion yuan. It realized a net profit of 102 million yuan in the first half of

Changyin Wuzhi Consumer Finance: realized operating income of 1.526 billion yuan and net profit of 446 million yuan. As of the end of the reporting period, Changyin Wuhachi Consumer Finance had total assets of RMB 27.859 billion and net assets of RMB 2.605 billion. Compared with the same period in 2022, Changyin Wuzhi Consumer Finance's first-half revenue increased 56% year-on-year and 13.3% sequentially, while net profit increased 90.6% year-on-year and 52.7% sequentially.

BOC Consumer Finance: The 2023 semi-annual report published by Lujiazui disclosed that as of the end of June 2023, BOC Consumer Finance's total assets were RMB 67.001 billion, an increase of 4.52% from the end of the previous year, and total liabilities were RMB 58.217 billion, an increase of 4.75% from the end of the previous year.

Lufthansa: Lufthansa Holdings realized operating revenue

of CNY9.27 billion in the second quarter, down 39.4% from CNY15.288 billion in the same period of 2022, and net profit of CNY1.004 billion, down 65.8% from CNY2.936 billion in the same period of 2022, according to announcement data. In the first half of the year, Lufthansa Holdings reported total revenue of 19.348 billion yuan, down 40.7 percent from the same period last year, and net profit of 1.736 billion yuan, down 78.9 percent from the same period last year, due to a decrease in the overall transaction volume and loan balance. As of June 30, the balance of loans empowered by Lufthansa Holdings was RMB 426.4 billion, down 35.5% year-on-year; the cumulative number of borrowers increased by 8.3% to approximately 19.7 million from approximately 18.2 million as of June 30, 2022.

Chifu Technology (360 Digital) has recently announced its second quarter and interim financial results for 2023. According to the announcement, in the second quarter, the company realized net revenues of NT\$3,914.3 million, down 6.43% year-on-year, and net income of NT\$1,093.4 million, up 12.15% year-on-year.

Jiayin Jinke: The financial report data showed that in the second quarter, Jiayin Jinke facilitated transactions amounting to 24 billion yuan, up 77.8% year-on-year; the proportion of repeat borrowers reached 70.1%, and the average borrowing amount reached 10,368 yuan, up 16% year-on-year.

Wearnes Gold announced data for the year ended June 30, 2023, showing total revenue of RMB1.918 billion, up 21.2% year-on-year and 24.8% sequentially, and net profit for the period of RMB302 million, down 7.9% year-on-year and up 47.8% sequentially.

## 4.2. Technical Support

Improve the digitization platform and promote data integration. To ensure the digitalization process of small and medium-sized enterprises continues to advance, it is necessary to build an efficient and unified digital platform. Enterprises need to fully reflect on the actual needs of enterprise development and management, do an excellent job of abstracting the analysis of the relevant needs, constantly improve the construction of the digital platform structure, do an excellent job of service path development and improvement, to set up a perfect system function, to ensure that the corresponding function module can meet the user's digital management and operation needs. The use of blockchain technology, combined with its traceability and transparency, promotes the transformation and upgrading of the industry, using direct transactions between peer-to-peer, providing the necessary data for online lending institutions to guarantee the enterprise's credibility, and realizing the full disclosure and reciprocity of information, so that online lending enterprises can engage in business under the sunshine, avoiding the occurrence of events such as illegal pooling of funds and loans, and reducing the number of lending enterprises that go bankrupt due to irregularities, resulting in the loss of consumer interests. Consumer interest loss behavior. It can also minimize the loss of the platform as much as possible in the case of the borrower. In each case, to meet the smart contract, the borrower can get a loan, and the contract can show the borrower's use of funds to help the platform know to avoid engaging in high-risk activities.

## 4.3. Policy support

Accelerate the establishment and improvement of the

public service policy system based on the industrial Internet, guide financial funds at all levels to increase the direct strength of the digital transformation of small, medium, and micro enterprises, establish the establishment of a special fund for the promotion of the application of the industrial Internet, and give subsidies to enterprises that are on the platform and use the platform. The establishment of relevant regulatory departments, the use of blockchain's traceability and non-comparability, regulation and purification of loan security so that the entire process of the loan is shown in front of the regulatory departments to crack down on loan sharks, money laundering, and other illegal and criminal behavior, to ensure the legitimate rights and interests of the borrower. As for the platform, because a small number of enterprises on the online lending platform are trying to gain a competitive advantage, which leads to a large number of poor-quality customers entering the field, the blockchain can be well combined with computers to ensure the integrity of the platform's transaction information, and with the help of big data technology to assess the credit level of the borrower, to solve the problem of the difficulty of collecting payments at the source, and in the follow-up process, if there is a case of the borrower's non-repayment and so on, the use of the If the borrower does not repay the money in the subsequent process, the data on the chain will be collected and organized, and the credit system will be used so that the "old scoundrels" will have no place to go. [4]

## 4.4. Legal support

China's current legal system, currently more than a single department or multiple departments jointly issuing regulations, business guidance, and guidance, did not form a complete regulatory law with the effect of the supreme law; the regulatory system is not uniform enough; there is no clear standard, it is difficult to legally define so that in the actual regulatory process, we will face a series of problems such as difficult to regulate, regulatory weakness and so on, increasing the consumer in the risks in the process of online lending, which is not conducive to the healthy and stable development of the field.

## 5. Conclusion

According to research, with the help of probability tree models and AHP models, small and micro enterprises can decide early on whether to exit the field or undergo transformation and upgrading. After confirming the need for enterprises to make changes, in the current context of the Internet, small and micro enterprises can receive sufficient financial support, blockchain technology support, and comprehensive legal protection measures for online loans. These conditions can effectively help enterprises implement comprehensive transformation and upgrading. Therefore, the current social conditions encourage small and micro enterprises to transform and upgrade to overcome difficulties actively. To solve the problem of difficult employment and ensure the Chinese economy's healthy, reasonable, and orderly development.

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