Risk Assessment and Analysis in Supply Chain Finance Based on Blockchain Technology

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With the development of the times, the financial industry is constantly changing. Blockchain technology continues to play an important role in supply chain finance. The security of the financial industry is very important. Blockchain technology can better protect the security of the financial industry, but there are also some risks. We have made a detailed investigation and research on the risk assessment and analysis of blockchain technology in supply chain finance. The research is as follows: (1) the risks under blockchain technology are introduced in detail, and the risks in many aspects are detailed. It is convenient for the public to do a good job in risk control in the use of blockchain finance. (2) The algorithm of the blockchain is used for mining. In finance, the security of privacy is the most important. The differential privacy in the algorithm and the Bc-ppkCa algorithm makes the financial privacy under the blockchain better. It is beneficial for the public to use blockchain technology more efficiently and safely. (3) The financial industry under the blockchain is very complex. Let us take the financial situation under industrial enterprises as an example. Investigate the company’s supply chain financial situation data, and compare the advantages of supply chain finance and the company’s financial situation. It also evaluates the risks generated by supply chain finance and makes corresponding analysis.

1. Introduction

In order to be able to fully exploit the key role of the new blockchain technology in supply chain financing, supply chain financing has developed into one of the hotspots in the application of blockchain technology. This article analyzes and discusses supply chain finance risk and proposes a new method of managing supply chain finance risk based on blockchain technology based on the characteristics of blockchain technology. It is aimed at improving the level of financial risk management and control in the supply chain, highlighting the great role of blockchain technology in supply chain risk management, and better developing financial services in the supply chain for the real economy [1]. Assess supply chain finance risks, account for claims, use evolutionary game methods to analyze factors affecting supply chain finance participants, and create supply chains for evolutionary game models in financial firms. SMEs and financial institutions analyze blockchain mechanisms for managing financial risks in supply chains and compare changes in development and sustainable development strategies before and after blockchain technology adoption. The strict regulatory environment created by blockchain technology means that SMEs and key companies are at greater risk at all times. SMEs will choose not to make repayments regardless of the profit margin achieved through cooperation and will effectively address the paradox that SMEs cannot obtain credit from financial institutions while increasing the ability to comply. Then, the evolutionary game between financial institutions and SMEs is balanced by financial institutions using business applications, SMEs adhere to contracts, and the convergence effect is better. Therefore, blockchain technology not only reduces the financial risk of financial institutions but also helps to solve the financial problems of small- and medium-sized businesses [2]. The purpose is to create a conceptual framework for blockchain-driven supply chain finance solutions. This framework is intended to facilitate coordination between buyers and sellers. In addition, it reduces inefficiency in implementing discrete financial instruments in the supply chain,
such as reverse factoring and dynamic discounting. In addition, the value drivers of blockchain technology are introduced, and their uniqueness in supply chain financing applications is explained. Although blockchain is considered a groundbreaking financial technology, there is very little research on its impact on supply chain financing. Therefore, on the basis of the latest technological innovations, contribute to the future development of supply chain financing [3]. The undermining and innovation of the Internet have led to supply chain financing moving towards the Internet, i.e., financing of the Internet supply chain. This document assumes that the main part of the Internet supply chain is diversified and that individuals are involved in the financing of the Internet supply chain, from financial institutions, key companies, to upstream and downstream SMEs and logistics companies, with a focus on large-scale Internet supply chains. The financial model and related risk factors have been demonstrated, with regard to the risk factors, the mechanism of use and the framework for blockchain technology in financial risk management of the Internet supply chain, and the method for financial risk management of the Internet supply chain based on blockchain technology [4]. Based on blockchain technology, all participants in the supply chain establish a consortium blockchain to form an ecosystem. In this consortium blockchain, all participants can perform operations such as supply chain finance and targeted marketing. The supply chain based on blockchain solves the problem of credit endorsement of core enterprises, establishes a shared alliance platform, intelligently adjusts the remaining credit limit, realizes payment and settlement on time with the help of smart contracts, and strengthens management. Blockchain-based supply chain finance simplifies the application process, promotes credit and credit reporting-related businesses, and improves the social and economic benefits of this system [5]. With the improvement of supply chain financing, the credit risk of supply chain financing for small- and medium-sized financial enterprises has become apparent. Risk management is one of the main tasks when borrowing from banks and other financial institutions and goes through all the stages before, during, and after borrowing. An ambiguous neural network algorithm is used to process financial data and assess risk, effectively addressing and improving risk management in the supply chain [6]. Blockchain (BCT) promises to change the way individuals and businesses exchange value and information online and is well placed to facilitate a new level of collaboration between players in international supply chains. The book discusses how BCT can facilitate supply chain financing (SCF) initiatives, as the authors consider SCF to be another leading provider of financial services to improve supply chain cycles [7]. Blockchain can provide persistent, shared, and verifiable product records throughout the supply chain, improving product traceability, authenticity, and legitimacy in a more cost-effective manner. This section discusses the potential expectations for agribusiness development using blockchain technology. A case designed for car production is also presented: a micro factory using blockchain technology [8]. Supply chain financing has made a significant contribution to the financing and development of SMEs in recent years. However, due to problems in the supply chain system itself, the development of supply chain financing has stalled. The state of supply chain financing and the development of the blockchain+supply chain financing platform are analyzed. In response to the platform's challenges, the blockchain-based financial supply chain platform was creatively divided into four modules: authorization management, credit management, contract management and traceability, further design optimization, and full use of technical functions and authentication. In order to expand transactions and data exchange, supply chain financial services achieve full coverage of the supply chain. Finally, following an analysis of the platform's potential risks, appropriate proposals are put forward [9]. Develop a new blockchain technology information security management system that is not currently available in national and international information security standards. Key facts: blockchain technology is a secure, relatively new technology in a distributed digital book, based on interconnected blocks of operations, providing great benefits such as decentralization, transparency, consistency, and automation. The adoption of blockchain technology is growing rapidly in a variety of solutions and applications around the world and in a variety of industries such as finance, supply chain, digital identity, energy, healthcare, real estate, and government sectors [10]. Blockchain, as the core bitcoin technology and structure, consists of credit and credit processing systems and is characterized by decentralization, unreliability, anonymity, and unnecessary data manipulation. Big data online supply chain financing not only brings unique financing benefits to small, medium, and microenterprises but also poses new operational and regulatory risks. The application of blockchain technology in online supply chain financing through the coordinated development of blockchain and online supply chain financing is essential to prevent and control the risks of online supply chain financing. However, as a new technology, blockchain technology is still in the research phase and faces many challenges, such as building block hardware infrastructure, professionals, and consensus mechanisms [11]. Through the continuous and consistent implementation of the Internet+development strategy, supply chain financing using Internet technologies is gradually becoming the most important way of financing small- and medium-sized businesses. The close integration of supply chain financing with real industries and finance has made a significant contribution to the continuous improvement of supply chain actors, especially SMEs. Integrating blockchain components and attributes into different supply chain financing application chains can effectively address the SME financial supply chain financing dilemma [12]. Investigate the role of blockchain technology (BCT) in supply chain management (SCM), with a particular focus on interorganizational and customer confidence in the product. The following sections, arranged topologically, deepen the role of technology in supply chain management. This report begins by defining supply chain management from an overall perspective and then focuses on the elements that make up the basic principles of supply chains, namely, the flow of information, materials, and cash. Compare the functions of
BCT with the elements of SCM and create a system that reveals the areas where technology plays a key role. The application of the method in the field of maximum convergence is further analyzed through case studies and reviews of scientific articles. Propose a data architecture in which BCT could play its role in supply chain management while ensuring that only sensitive parties in the relevant value chain could see sensitive company information [13]. Businesses around the world, and more specifically today, are moving to digitize and eliminate time-consuming processes. As knowledge of the origin and security of products become increasingly important in building end-user confidence, traceability solutions are urgent. Blockchain (BC) is one of the most exciting technologies today. The aim of the study was to analyze the possibility of using BC to fully monitor supply chain management and to provide guidance on the application of BC to fish monitoring and control in the supply chain environment [14]. Blockchain provides a secure and reliable guarantee for information transactions. Business partners share information and interests, as well as share risks, which has led to integration into a chain of blocks. However, the biggest challenge of this integration may be building trust. The proposed solution is to create a supply chain financial services system based on the consortium blockchain. When SMEs need financing, they can effectively obtain a loan through a blockchain system. Thanks to the consensus mechanism and encryption technology in the supply chain, the system provides more convenient methods for controlling and monitoring financing for companies, banks, and regulators and speeds up financing for ancillary companies. At the same time, the system makes the financing process transparent, secure, and traceable. On the one hand, the system changes the way information is stored in a chain of blocks from the relevant SME systems. On the other hand, regulators can effectively monitor the actual use of credit by SMEs. This partly addresses the financial difficulties of SMEs [15]. For the supply chain finance in the blockchain application scenario, the above literature highlights that blockchain technology has many other incomparable technical characteristics, while the traditional supply chain finance model still has many problems, and blockchain technology can solve the existing problems pertinently and, to a certain extent, carry out early warning and effective control of many risks in the supply chain financial operation process. In view of the fact that the content of risk assessment and analysis is relatively small, this paper analyzes the risk behavior in the blockchain.

2. The Main Risks of Blockchain Technology in Supply Chain Finance

2.1. Security Issues. Security risks for blockchain applications include significant data breaches and key loss. Every participant must have access to all transaction data, and even some sensitive information must be made public. In addition, the encryption technology used in blockchain is immature and does not have a certain level of privacy protection, which makes some sensitive information easy to leak. Public keys represent identity in blockchain technology, and its security is the foundation of trust. The private key belongs to each user, ensuring the security of digital property, and its loss will cause huge economic losses and damage to the owner’s interests. Furthermore, the loss of keys makes these losses irreplaceable due to the uniqueness of the keys and the lack of a private key reissue mode. It is shown in Figure 1.

2.2. Credit Risk of Core Enterprises. In supply chain finance, the main player is the leader who brings relevant players together and engages them through solidarity created by specific common interests. It occupies a key position in the supply chain. Other companies in the supply chain are hub companies. The company is the center of logistics, capital flow, and information, around which the production activities of the hub company are organized. Based on the evaluation of the creditworthiness of large companies, the authenticity and risk of transactions, and the overall reliability of the supply chain, financial institutions provide financial services, assets, liquidity, and financial services to related companies in the chain around large companies in key supply chain companies facing serious credit crises, credit impact, cash flow, and other risks; relevant small- and medium-sized enterprises and small and microenterprises will be affected; and the cash flow of the entire supply chain will be blocked. The credit risk of key enterprises will be distributed throughout the supply chain, and the supply will threaten the overall security of online financing.

2.3. Performance Issues and Latency. In terms of performance and scalability, since the data storage capacity of each block is limited, if the transaction data gradually increases, the system traffic and storage capacity of nodes will be extremely difficult to manage. Expanding the management of large operations poses significant risks to supply chain financing and, secondly, the issue of latency. Blockchain technology delays transactions because the more consensus-level nodes used to fund the supply chain and the longer it takes to validate data, the more efficient blockchain financial transactions are. Blockchain’s supply chain may rely on Internet transmission, resulting in delays in technical transactions of blockchain. It is shown in Figure 2.

As can be seen from the relationship between supply chain financing and blockchain services in Figure 2, the main value of supply chain financing lies in optimizing the allocation of funds over time and space and supplementing with risk and efficiency sharing across time and space. Save value to balance supply and demand. Key companies have a strong say in most supply chains and usually do not use cash transactions for suppliers, but rather transactions with settlement times $d$. Because the blockchain itself is not controllable, the distribution is a cross-validation mechanism to verify the credibility of each node’s business. Data is guaranteed, which solves the problem of identity credibility in financing and lending equity certificates and improves the ability to control the creditworthiness of financial institutions, which also reduces the complexity of controlling their risks significantly.
3. Blockchain Algorithm

3.1. Localized Differential Privacy. The basic definition of localized differential privacy is as follows:

Given $m$ users, each user corresponds to a record. If the privacy algorithm $F$, for any two input records $m_0, m_1 (m_0, m_1 \in DF)$, the same output result $m^* (m^* \in RF)$ satisfies the following inequality:

$$\Pr[F(m_0) = m_4] \leq e^\varepsilon \times \Pr[F(m_1) = m_4].$$

3.2. Immediate Response Mechanism. The random response mechanism is currently the main local differential data protection mechanism. To illustrate the rationale more clearly, here is a concrete scenario: I want to study the number of depressed people among $n$ users, so I activate a privacy policy for each user. Deciding whether to answer the question by tossing a coin is true. Let the probability of the tail appearing be $1 - p$. When the ratio of the privacy budget to the probability $p$ satisfies the following formula, local differential privacy is satisfied.

$$p = \frac{e^\varepsilon}{1 + e^\varepsilon}.$$

3.3. Differential Privacy. Differential privacy is increasingly applied in the fields of data sharing and data recovery. Compared with many other data protection methods, it is based on strict mathematical definitions, which can measure the level of data protection through parameters, ensuring that even if two data sets differ only in one element, the same query data set is performed on both elements, Algorithm A satisfies

$$\Pr[A(D_0) \in S_A] \leq e^\varepsilon \times \Pr[A(D_1) \in S_A].$$

Differential privacy can be applied to machine learning, recommender systems, censuses, traffic information protection, and more. Google uses localized differential privacy technology to collect more than 14 million user behavior statistics from Chrome every day. Apple also uses localized differential private technology to protect the privacy of iOS/macOS users. Yisaitong, as a major company in the data security industry, recognizes the potential of privacy-friendly computer technology, which is expected to be widely used and has continued to increase its investment in research and development of differential computer privacy protection.

3.4. $M-kCCIA$ Algorithm. Take household expenditure as an example, such as $Y = ax_1 + bx_2 + c + \text{random error term}$ represents household expenditure, represents household income, represents household wealth, and is a constant, that is, household basic consumption. At this time, the random error term represents GDP, consumer price index, industrial product price index, local currency exchange rate, commodity price index, average house price, average child education expenses, and so on. We know that income and wealth are more direct variables that determine household spending, so we introduce them into the model, and both macroeconomic conditions and price levels indirectly affect household spending.

In $M-kCCIA$, in order to protect the private data of each user, it is necessary to perform random perturbation processing on the private data of each user according to the random response mechanism, and the processing method is designed for $M-kCCIA$. For the $p$-bit, the probability formula of its perturbation value is as follows:
the data set $DO_i$ broadcasts the perturbed binary strings $B^*_{\text{Sum}_q}$ and $A^*_{\text{Num}_q}$ to the blockchain

(5) Running the algorithm

Explain Random2 and Random3 used in Algorithm 3: $m$ users $DO_1, DO_2, \ldots, DO_m$. Their respective privacy budgets are $\epsilon_q, \epsilon_a$, where $\epsilon_q$ is the privacy budget of the sum of each type of attribute value in each iteration and $\epsilon_a$ is the privacy budget of the sum of the number of each class in each iteration. Each bit is perturbed by a random response mechanism. Then, the value of $a_{i,j,b}$, $b_{i,j,b}$ obtained by the disturbance $\epsilon_q, \epsilon_a$, and its corresponding relationship are

$$\Pr(a_{i,j,a} = 1) = \frac{1}{2} f_{a_{i,j}},$$

$$\Pr(a_{i,j,a} = 0) = \frac{1}{2} f_{a_{i,j}},$$

$$\Pr(b_{i,j,b} = 1) = \frac{1}{2} f_{b_{i,j}},$$

$$\Pr(b_{i,j,b} = 0) = \frac{1}{2} f_{b_{i,j}}.$$  

(15) 

(16) 

(17) 

(18) 

(19) 

(20)

Among them, the probability of $b_{i,j,b}$ ($0 \leq j_b \leq l_1 - 1$, $a_{i,j,b}$ ($0 \leq j_a \leq l_2 - 1$) disturbance being the real value is $1 - (1/2)f_{b_{i,j}}, 1 - (1/2)f_{a_{i,j}}$, respectively, and it can be known from the theory of random response mechanism:

$$1 - \frac{1}{2}f_{b_{i,j}} = \frac{e^{q_{i,j,b}}}{1 + e^{q_{i,j,b}}}(0 \leq j_b \leq l_1 - 1),$$

$$1 - \frac{1}{2}f_{a_{i,j}} = \frac{e^{q_{i,j,a}}}{1 + e^{q_{i,j,a}}}(0 \leq j_a \leq l_2 - 1),$$

which is

$$f_{b_{i,j}} = \frac{2}{1 + e^{q_{i,j,b}}}(0 \leq j_b \leq l_1 - 1),$$

$$f_{a_{i,j}} = \frac{2}{1 + e^{q_{i,j,a}}}(0 \leq j_a \leq l_2 - 1).$$

(21) 

(22) 

(23) 

(24)

4. Investigation and Research on Supply Chain Finance under Blockchain Technology

4.1. Definition of Supply Chain Finance. Supply chain financing is the link connecting connect the enterprise, that is, large- and medium-sized enterprises and core enterprises. Complete financing, loans, etc., through supply chain financing. Shenzhen is China’s economic development zone and the place where my country’s supply chain financing

$$\Pr(c_{q,p} = 1) = \frac{1}{2} f_{1,p},$$

$$\Pr(c_{q,p} = 0) = \frac{1}{2} f_{1,p},$$

$$\Pr(c_{q,p} = c_{q,p}) = 1 - f_{1,p}.$$  

(4) 

(5) 

(6)

In $k$-kCCIA, both the user and the blockchain know $f_{1,p}$. The user can evaluate the corresponding real value of each bit according to the existing perturbed binary strings $c_{q,p} = \{c_{p,0}, c_{p,1}, \ldots, c_{p,l-1}\}$ and $f_{1,p}$, and the calculation is as follows:

$$\tilde{c}_{q,p} = c_{q,p} \times f_{1,p} + \frac{1}{2} f_{1,p},$$

$$c_{q,p} = \frac{\tilde{c}_{q,p} - (1/2)f_{1,p}}{1 - f_{1,p}}.$$  

(7) 

(8)

The corresponding decimal is

$$c_q = \sum_{p=0}^{l-1} (2^p \times c_{q,p}).$$  

(9)

3.5. $k$-PPkCA Algorithms. Input: the initial perturbed cluster center $c^1, c^2, \ldots, c^k$ is obtained from the blockchain; the data set $DO_1, DO_2, \ldots, DO_m$ of m users \{d_{i,1}, d_{i,2}, \ldots, d_{i,n_i}\} \ldots, \{d_{m,1}, d_{m,2}, \ldots, d_{m,n_m}\}$, the privacy budget $\epsilon_1, \epsilon_2, \epsilon_a$.

Output: clustering results.

(1) $M - k$CCIA runs $c^1, c^2, \ldots, c^k$ to get

(2) Each user $A$ obtains $A$ from the blockchain, and each user operates

(3) According to the data owned by each user $DO_i$, locally calculate the attribute value of each class after the $y$-th iteration classification and $\text{Sum}_{i,y,q}$ and the sum of each class and $\text{Num}_{i,y,q}$ ($1 \leq q \leq k$)

(4) Each user $DO_i$ performs the following calculations:

$$\text{Sum}_{i,q,y} = |\text{Sum}_{i,q,y} \times 10|,$$  

(10)

$$B_{\text{Sum}_q} = \{b_{i,j,a,y}, b_{i,j,b,y}, \ldots, b_{i,j,l,y}\},$$

(11)

$$A_{\text{Num}_q} = \{a_{i,j,a,y}, a_{i,j,b,y}, \ldots, a_{i,j,l,y}\},$$

(12)

$$\tilde{B}_{\text{Sum}_q} = \text{Random2}(B_{\text{Sum}_q}, \epsilon_a, r^*_2),$$

(13)

$$\tilde{A}_{\text{Num}_q} = \text{Random3}(A_{\text{Num}_q}, \epsilon_a, r^*_3).$$  

(14)
was first born. It entered the field of supply chain financing through “discount account” transactions. Business enterprises in my country are the most important link in supply chain financing, because the main basis for corporate financing is the valuation of receipts and deposits. Studying the development of accounts receivable and net inventory of industrial enterprises in my country in the past ten years will help to establish a supply chain financing system in an all-round way. It is shown in Figure 3 and Table 1.

According to the data of the National Bureau of Statistics of China, the net accounts receivable of industrial enterprises in my country from 2011 to 2020 increased rapidly from 8,023.167 billion yuan in 2011 to 13,612.448 billion yuan in 2020 and showed an upward trend, with a growth rate of about three times. This shows that the doubling of the net claims of industrial enterprises in the past decade is an important prerequisite for the continuous expansion of my country’s financial market in the supply chain. It is shown in Figure 4 and Table 2.

According to the statistics of the National Bureau of Statistics of China, my country’s industrial inventory is increasing day by day and has increased by 2.4 times in ten years. This shows that the productivity of my country’s industrial enterprises is continuously improving, and the financial supply chain market is developing well. It is shown in Table 3.

The research of domestic and foreign scholars mainly focuses on the application effect, risk prevention and control, and some industry fields, and there are few system construction and analysis on the blockchain supply chain finance. This paper briefly describes the advantages of supply chain finance and the perspectives of chain code implementation and privacy protection to build a system template for blockchain technology in supply chain finance to enhance the security and processing efficiency of blockchain financial technology. The application innovation has strong reference value.

4.2. Hotspot Analysis of Blockchain Theme Research. A research topic reflects changes in the research perspective and research focus of a particular field over a certain period of time. Keywords can be a good representation of the topic of the article. Keyword occurrence and cluster analysis help capture the changing trends of popular keywords. Time view provides guidance on how to track research trends in the field. “Blockchain,” “blockchain technology,” “industry chain,” and “blockchain finance” are the four major clusters. The quality of clustering is usually determined by two indicators, one of which is the value of the clustering module (modularity); usually the higher the value, the better the clustering effect. The next one is the mean of the cluster contours. When $S > 0.5$, the clustering is considered reasonable. The closer the value is to 1, the higher the network homogeneity. The clustering results of the test objects show that $Q = 0.8489$ and $S = 0.9767$; the clustering results are good and reliable.

From Table 4 in the text, it can be seen that “blockchain,” “information asymmetry,” “agricultural supply chain finance,” “supply chain finance,” and “small- and medium-sized enterprises” have high network homogeneity and good clustering effect. The lowest homogeneity is cluster 4 and

![Figure 3: Net receivables from industrial enterprises in my country from 2011 to 2020.](image)

| Year | Net receivables from industrial enterprises in my country from 2011 to 2020 (100 million yuan) |
|------|------------------------------------------------------------------------------------------------|
| 2011 | 71221.67                                                                                     |
| 2012 | 85334.78                                                                                     |
| 2013 | 90334.47                                                                                     |
| 2014 | 101242.89                                                                                    |
| 2015 | 112355.34                                                                                    |
| 2016 | 122546.77                                                                                    |
| 2017 | 132527.66                                                                                    |
| 2018 | 137432.44                                                                                    |
| 2019 | 142356.21                                                                                    |
| 2020 | 145327.25                                                                                    |

Table 1: Net receivables from industrial enterprises in my country from 2011 to 2020.
cluster 5, which are 0.921 and 0.949, respectively, which indicates that the whole cluster has a strong rationality.

It can be seen from Table 4 that the three largest clusters are cluster 0, cluster 1, and cluster 2, and the number of documents is 30, 28, and 25, respectively. Furthermore, 5 of the 12 clusters had an average score of clusters 1, i.e., the blockchain information asymmetry. Agricultural supply chain financing, supply chain financing, and SMEs have high network uniformity and the best clustering effect. The homogeneity of cluster 4 and cluster 5 is the lowest, which are 0.921 and 0.949, respectively, indicating that the cluster as a whole shows a strong rationality. In addition, the average release year of the 7 clusters including blockchain, blockchain technology, commercial banks, and small and microenterprises is 2019, which indicates that these clusters are hotspots of research trends in these fields and are closely connected and keep pace with the times.

4.3. Blockchain and P2P Financing Model. P2P is an innovative financial model based on the rapid development of Internet technology and the characteristics of economic development, focusing on the financial difficulties of small-and medium-sized enterprises. It provides small loans to applicants through a third-party platform. These include peer-to-peer or personal loans. Topics include third-party mediation platforms, SMEs, fund providers, and other service providers. The financial service platform only charges handling fees, does not interfere with the operation of the project, does not provide guarantees, and does not assume risks. In terms of P2P transactions, there has been a trend of first increase and then decrease in recent years. It peaked in 2017 and then declined year by year. By 2019, the transaction volume was 964.511 billion yuan, down 46.26% from the previous year in 2018. At the same time, the balance of industry loans has decreased; from the perspective of industry development, the balance of loans has declined year by year, mainly due to the transformation of some platforms, investor caution, and the so-called “three declines” in the observation. It is shown in Figure 5.

In terms of P2P services for small and microenterprises, statistics show that from 2014 to 2017, there is a positive correlation with the development of the industry. Small and microbusiness transactions also declined in 2018. It is shown in Figure 6.

Although P2P platforms provide a new way to draw money channels facing the enterprise by raising useless funds from society, the financing conditions are short and the cost is relatively high. The lending rate of P2P platforms is generally 10-20%, and the platform will also require a certain interest rate. The interest rate of commercial loans within one year is usually around 5%, and the higher financing cost increases the burden on the development of small-and medium-sized enterprises. At the same time, due to lack of funds and weak supervision, P2P platforms are mixed in nature, a large proportion of websites are outside financial supervision, and most of their activities are on the verge of breaking the law. In particular, the “thunderstorm” incident in recent years has profoundly reflected the flaws in the
development of the industry. The platform is a virtual or unreal target of illegal fundraising, resulting in financial fraud that does not protect the legitimate rights and interests of investors. P2P platforms have experienced a large number of failure events over the years, resulting in significant negative consequences, exposing the underlying flaws and inadequacies of the model, and are in the process of being phased out and disappearing. It is shown in Figure 7.

The rapid development of most things is largely due to improved infrastructure. From today’s point of view, blockchain technology can be seen as a very important new infrastructure for P2P on the Internet and even the entire financial system, as well as a huge change in the highway transportation industry and the container in the shipping industry.

4.4. Supply Chain Financial Risk Assessment and Control. In a relatively closed supply chain network, through close cooperation, supply chain financing can solve capital problems at various stages, shorten the cash flow cycle, and reduce the operating cost of enterprises, but as a “double-edged sword,” it can lengthen the supply chain. The operational efficiency

Table 3: Some cooperative institutions and companies that have joined the alliance chain.

| Organization type          | Part of the list of institutions that have joined the alliance chain                                                                 |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Commercial Bank            | Minsheng Bank, China CITIC Bank, China Everbright Bank, China Zheshang Bank, etc.                                                 |
| Joint venture              | Tencent, Alibaba Cloud, Fun Chain Technology, Net Record Technology, Zhonglian Technology, etc.                                   |
| Small loan company         | Lujin Loan, You and Me Loan, Renren Loan, Huijinsuo, etc.                                                                           |
| Asset management company   | Great Wall Asset Management Company, China Railway Construction Asset Management Company, etc.                                   |

Table 4: Keyword clustering table.

| Cluster number | Number of documents | Network homogeneity indicator | Average year | Cluster name                        |
|----------------|---------------------|-------------------------------|--------------|------------------------------------|
| 0              | 30                  | 1                             | 2019         | Blockchain                         |
| 1              | 28                  | 0.961                         | 2019         | Blockchain technology              |
| 2              | 25                  | 0.992                         | 2018         | Industrial chain                   |
| 3              | 21                  | 0.992                         | 2018         | Blockchain finance                 |
| 4              | 20                  | 0.921                         | 2017         | Financial innovation               |
| 5              | 17                  | 0.949                         | 2019         | Commercial Bank                    |
| 6              | 14                  | 0.954                         | 2019         | Small and micro enterprises        |
| 7              | 12                  | 1                             | 2017         | Information asymmetry              |
| 8              | 11                  | 1                             | 2019         | Agricultural supply chain finance  |
| 9              | 11                  | 1                             | 2018         | Supply chain finance               |
| 10             | 11                  | 1                             | 2018         | SMEs                              |
| 11             | 10                  | 0.96                          | 2019         | Internet of things                 |
| 12             | 6                   | 0.987                         | 2019         | Trade acceptance draft            |

Figure 5: Transaction volume of China’s P2P financial industry from 2014 to 2019.
of a company also introduces certain risk factors into activities. To assess financial cyber risk in the supply chain, we mainly study the internal risk of enterprises, and the results are shown in Figure 8.

As shown in Figure 8, we know that the probability of occurrence of supply chain relatedness risk is the lowest at 5%; the highest proportion of supply chain trade background risk is 23%, and other inherent risks have occurred, and these inherent risks should occur frequently. Carry out risk control and assessment, and summarize the data obtained from the assessment in a timely manner. We also manage and control according to the risk and summarize the following methods. We have investigated the use ratio and effectiveness of these methods. The data is shown in Figure 9.

As can be seen from the figure, we have summarized the 7 most commonly used methods for risk management and control. The minimum effective degree of strengthening internal control to prevent operational risks is only 0.57; clarifying the rights and obligations of all parties reduces legal risks and gradually builds a complete supply chain. The financial risk assessment model and the establishment of a professional supply chain financing operation team are very close to the effectiveness of these three methods, all between 0.9. In terms of proportion of use, establishing a rapid market commodity information collection and feedback system is the most used method to prevent risks, and the least used method is to prudently select the supply chain group to be credited. For supply chain financial risk

Figure 6: Trend of transaction scale of P2P financial services for small and microenterprises (100 million yuan).

Figure 7: Distribution of P2P financial platform problem types.
5. Conclusion

This paper makes a detailed introduction and investigation of supply finance under the blockchain technology. Finance under the blockchain has better development prospects and is constantly being used by people in the development of the times, but security issues have become the top priority. We introduced the problems encountered by the blockchain and studied the algorithms corresponding to the blockchain. It is convenient for people to deal with the blockchain problem, and an industrial enterprise is taken as an example to study supply chain finance. Supply chain finance under blockchain technology has corresponding risks, and a comparative study has been made on the risks that may be encountered and the corresponding risk management and control.
Data Availability

The experimental data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The author declared that there are no conflicts of interest regarding this work.

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