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Retraction

Retracted: Blockchain Empowers Chain Enterprises in the Digital Economy to Strengthen Risk Management Research

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] W. Su, "Blockchain Empowers Chain Enterprises in the Digital Economy to Strengthen Risk Management Research," *Journal of Electrical and Computer Engineering*, vol. 2022, Article ID 2580176, 12 pages, 2022.

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Research Article

Blockchain Empowers Chain Enterprises in the Digital Economy to Strengthen Risk Management Research

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With the vigorous development of blockchain technology, researches on various "blockchain+" scenarios continue to bring forth new ideas. As some of the characteristics of the blockchain technology itself deeply meet the demands of the development of chain enterprises, it can better control the related risks of enterprises. Therefore, it is necessary to combine the characteristics of blockchain technology with the characteristics of chain enterprise risks and the interaction mechanism for research. This article aims to study how to strengthen risk management for chain enterprises in the digital economy. For this reason, this article proposes a method to empower the digital economy through the blockchain and calculates and analyzes the risk measurement so that it can effectively estimate the risk. This article also designs an experimental analysis to explore its effect. The experimental results of this paper show that after the improvement, the risk of chain enterprises is reduced by 35%, and the risk is effectively controlled.

1. Introduction

In recent years, blockchain, as the underlying technology of Bitcoin, has set off an upsurge of investing in financial technology, and has attracted the attention and pursuit of all walks of life around the world. Blockchain is regarded by relevant experts as the most promising revolutionary core technology after cloud computing, Internet of Things, and big data. It has set off an upsurge in the application of blockchain technology in various fields. Supply chain finance is a multiparticipant, relatively closed environment, which is controllable, credible, and supported by data. Combining the characteristics of blockchain technology itself, in terms of the authenticity of the trade background, the determination of the relationship between creditor's rights and debts, and the full recovery of logistics and capital flows. Traditional supply chain finance is difficult to solve and the cost is high, but blockchain technology has a better solution. It applies blockchain technology to supply chain finance, and the two are closely integrated and coordinated to solve many problems encountered in the development of supply chain finance. At the same time, it reduces the bank's risk control cost and solves the problem of lack of credit for small- and medium-sized enterprises under supply chain finance. This allows the idle bank credit lines of high-quality core enterprises to be passed on to small- and medium-sized enterprises, realizing trust circulation in the entire chain.

Through risk management, the cost of the enterprise is reduced, thereby directly increasing the economic benefits of the enterprise, for example, implementing cost-cutting policies, preventing and reducing losses, transferring potential losses to other organizations with the lowest transmission cost through actuarial insurance, and determining self-insurance risks, and the most reasonable self-insurance fund withholding, and so on. At the same time, risk management has made a lot of contributions to improving the economic benefits of enterprises. For example, risk management reduces changes in the company's benefits and cash flow. This makes it easier to communicate with customers, raw material suppliers, and creditors who are closely related to business development and economic efficiency.

Blockchain technology has the characteristics of trustlessness, high database reliability, decentralization, and collective maintenance. In recent years, it has become a hot spot for the United Nations, the International Monetary Fund Group, and the investment and financing fields, and various industries have also increased their efforts to submerge. The purpose of Sikorski et al. is to explore the application of blockchain technology related to the Fourth Industrial Revolution. They showed an example in which blockchain is used to facilitate machine-to-machine (M2M) interaction and establish an M2M electricity market. The scenarios presented by the chemical industry include two electricity producers and one electricity, and consumers trade with each other through the blockchain. All participants have obtained real data generated by the process model [1]. Zhang and Wen proposed an Internet of Things e-commerce model, which is specially designed for Internet of Things e-commerce. They redesigned many elements in the traditional e-commerce model. They also use P2P transactions based on blockchain and smart contracts to realize smart property and payment data transactions on the Internet of Things. They also experimented with their own design and conducted a comprehensive discussion [2]. Miraz and Ali proposed that in-depth research is currently being carried out in academia and industry to apply blockchain technology to various applications. Their work proved that (PoW) is a cryptographic puzzle. It plays a vital role in ensuring the security of BC by maintaining a digital ledger of transactions considered to be incorruptible. In addition, BC uses a variable public key (PK) to record the user's identity, providing an additional layer of privacy [3]. Yeoh studied the main regulatory challenges affecting blockchain and innovative distributed technologies in the European Union (EU) and the United States. His research results support the advancement of blockchain technology with minimal regulatory brakes to achieve greater value-added and efficiency improvements. Especially for financial services, his research expands the accessibility, thereby expanding financial inclusion. This also helps to draw more attention to the technology that supports virtual currencies [4]. Ittay believes that the cryptocurrency blockchain protocol or distributed ledger technology (DLT) in the financial technology (FinTech) sector has high potential value. He discussed blockchain research beyond Bitcoin, about how to close these gaps and some of the challenges that still exist [5]. Mansfield-Devine suggested that most people mentioned the term "blockchain," assuming they had heard of it and they would most likely associate it with Bitcoin or another cryptocurrency. As a decentralized, encrypted, and verified transaction record, the blockchain is the key concept that makes Bitcoin feasible. However, as SolarWinds' technical product marketing director explained in the interview, the application of the same concept goes far beyond the controversial world of alternative currencies—in fact, far beyond finance [6]. Biktimirov's project elaborated on the configuration and mathematical model of distributed blockchain data storage. Blockchain is used to implement various information technology applications, as well as the needs of blockchain derived from its analysis and structural characteristics [7]. Jang proposed that one of the technologies that has attracted much attention with the advent of the fourth industrial revolution is blockchain. It is one of the outstanding technologies that will change the future. In his context, the scale of investment related to blockchain is growing rapidly. In particular, the banking industry has become the core technology of the global financial market due to financial trends through the application of blockchain. As a new paradigm applied to the business field of enterprises, the application field is getting bigger and bigger [8]. The above-mentioned documents are still in place for the description of the relevant technical points, and the descriptions of some technologies are also very in-depth and worthy of study in this article. However, in the process of exploring the feasibility of some technologies, a reasonable experiment was not set up to verify them, which led to a decline in the credibility of the literature and low technical feasibility.

The innovation of this article is to use blockchain technology as the technical support to improve and optimize the risk measurement of chain enterprises. This makes it possible for companies to better estimate risks in the actual management process. This article discusses the enterprise risk management under the digital economy so that the enterprise risk management model can be more in line with the path of the contemporary development model.

2. Risk Management Methods

2.1. Blockchain Technology

2.1.1. Definition of Blockchain Technology. Broadly speaking, blockchain technology uses a blockchain data structure to verify and store data [9, 10]. It also uses a distributed node consensus algorithm to generate and update data and uses encryption to ensure data transmission and access security [11].

In a narrow sense, blockchain is a kind of chained data structure that combines data blocks in sequence in a chronological order. It is also a distributed ledger that cannot be tampered with or forged which is guaranteed by cryptography. The reliability of the database technology solution can be realized in a trustless and decentralized way. Through this technical scheme, any node in the system uses cryptographic calculation methods to transfer all the information exchanged in the system within a specific time. It records and operates on one data block and generates a unique identifier used to check and link the next data block. All nodes in the system will participate together and reach a consensus to judge whether the data is true or not.

Blockchain technology is essentially an Internet protocol, an unreliable decentralized database technology realized through collective maintenance. Blockchain technology can be implemented using many architectures and programming languages, and there are many ways to implement it [12], for example: POS mechanism, POW mechanism, DPOS mechanism, and so on.

In the financial field, "For the banking industry, blockchain is a highly digital, secure and anti-interference account book, which can be used to realize the core function of the bank. That is, as a safe storage and transfer center of value." In the report of Chuancai Securities Research Institute, we can simply analyze how the blockchain works from Figure 1.

With the continuous development of Internet technology, although general protocols (HTTP, TCP/IP, etc.) can be

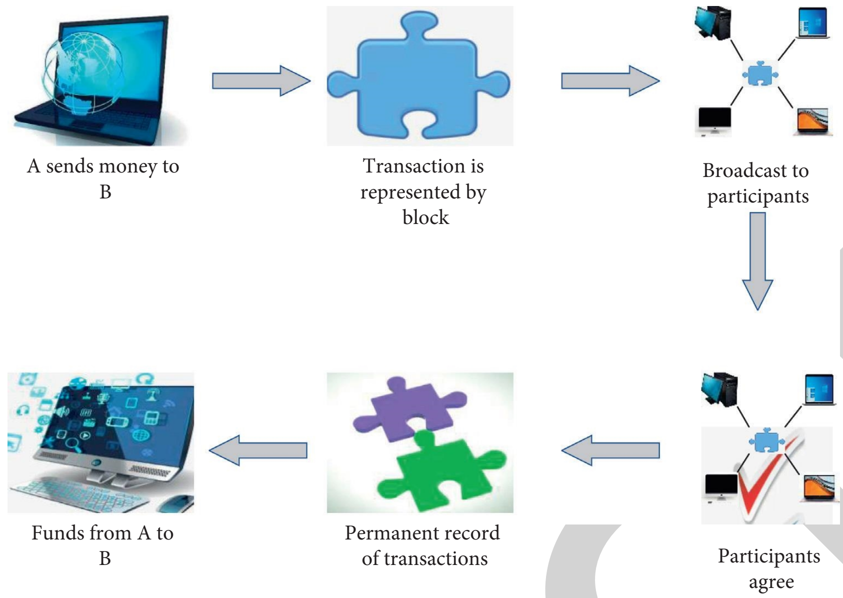


Figure 1: The working principle of blockchain.

used to complete the interaction of information. However, due to lack of information, financial service intermediaries still have the responsibility of providing value to financial service intermediaries as the center of accounts [13]. Due to the worldwide popularity of the virtual electronic currency "Bitcoin," the blockchain as a basic technology has gradually attracted the attention of all fields, especially the financial industry [14].

Therefore, some people also predicted blockchain technology. In the next 2 to 3 years, blockchain technology may undergo large-scale changes in the fields of Internet finance, Internet of Things, and big data. Entrepreneurs must pay attention to ten areas (artificial intelligence, genes, currency, Internet of Everything, new manufacturing, sharing economy, data, nanotechnology, wearable devices, and space exploration) that will develop rapidly in the future, which will play a leading role in future social and economic development [15–17]. According to various data analysis and integration, the applicable fields of blockchain are shown in Figure 2.

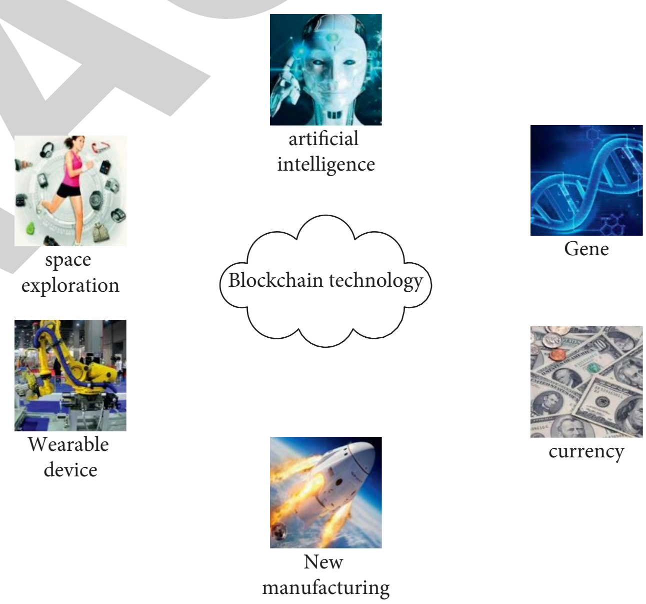


Figure 2: Application areas of blockchain technology.

In summary, from a technical point of view, blockchain is a decentralized large-scale general ledger. Without the participation of a unified clearing agency and credit intermediary, the transaction is directly completed with two points, realizing decentralization. It allows all people participating in the chain to obtain transaction records through their general ledger when a transaction occurs. And all transaction information will be disclosed and cannot be tampered with when encrypted [18].

The basic principles of blockchain technology operation can be understood from the following three basic concepts:

The first is transaction: every operation will be recorded into the ledger, and the storage status of the ledger will also change accordingly.

The second is the block: it records all transactions and the corresponding transaction status within a certain period of time and forms a consensus on the latest status of the ledger.

The third is the chain: the blocks are connected together in chronological order, and the changes of all states of the ledger are completely recorded [19].

In the implementation process, it is assumed that there is a distributed data recording ledger. This ledger is only allowed to be added, not deleted. The underlying basic structure of the ledger is a linear linked list, which is also the source of the name "blockchain." Taking Bitcoin as an example, it is actually a ledger. The ledger is scattered and the amount of data is extremely large. Each historical

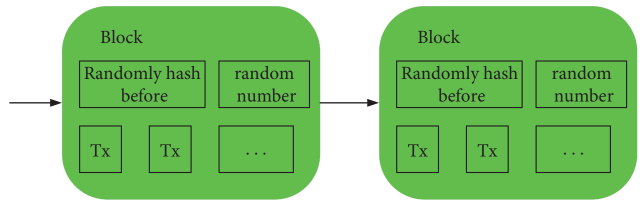


Figure 3: Partial structure of blockchain.

transaction record in the ledger will be stored on the Internet, and the information cannot be tampered with [20].

As shown in Figure 3, the linked list consists of a series of "blocks," and subsequent blocks record the hash value of the leading block. Adding new data needs to be placed in a new block, which can quickly confirm whether the block is legal by calculating the hash value. No matter which maintenance node can propose a new legal block, it will take a certain amount of time, and a consensus mechanism is needed for the additional block [21].

2.2. The Core Technology of Blockchain

2.2.1. Point-to-Point Network Protocol. As shown in Figure 4, the P2P network structure is a flat model. The status of all nodes is the same, and there is no central server. Therefore, each node has the same identity when implementing various functions of the blockchain system, and the framework of this network protocol is the decentralized network foundation [22].

In the blockchain system, there are two different ways of data dissemination: obtaining data and sending data by oneself [23]. Different from the centralized network mode, in this network mode, when node *a* receives a message from a neighboring node, it will check the validity of the data. If it is invalid information, node *a* will not forward data, and at the same time, it will disconnect the node that transmits invalid information within a period of time to prevent malicious attacks on the network. The received effective information will be broadcast to neighboring nodes [24].

2.2.2. Risk Measurement of Chain Enterprises. After identifying the various risks and potential losses faced by the enterprise, enterprise risk managers should measure the risks. It is necessary to estimate the frequency of various losses and the severity of these losses in order to evaluate the relative importance of various potential losses. This prepares for the formulation of risk treatment plans and risk management decisions.

Modern enterprise risk measurement mainly includes the following tasks:

(1) It collects information that can help estimate future losses.
(2) It sorts out and describes the loss data.
(3) It uses probability and statistics tools for analysis and prediction.

In order to find future loss models that may be obtained from past losses, enterprise risk managers should try their best to collect loss data. When collecting loss data, it is required to ensure that the data is complete, uniform, relevant, and systematic, and the data must be obtained with reasonable financial resources and time.

2.2.3. Digital Description of the Loss Data of the Enterprise. The central tendency indicator refers to a numerical value that is representative of all data. For the convenience of presentation, we use the collected loss data as a sample, and each data value is called an observed value [25].

(1) *Number of Positions*

The median value of the total distance is the midpoint value between the smallest observation value and the largest observation value in the sample; namely,

$$\text{Mid} - \text{range} = \frac{\text{Minimum observation} + \text{Maximum observed value}}{2}. \quad (1)$$

(2) *Median*

Assuming that the data have been arranged in increasing order, and the number of observations is odd, the median is the observation in the middle [26].

For grouped samples, the median is calculated using the following formula:

$$\text{median} = \text{Median array offline} + \frac{n/2 - \text{Accumulation frequency}}{\text{Frequency of the median array}}. \quad (2)$$

Here n is the number of observations in the sample.

(3) *Arithmetic Mean*

The most commonly used position quantity is the arithmetic mean.

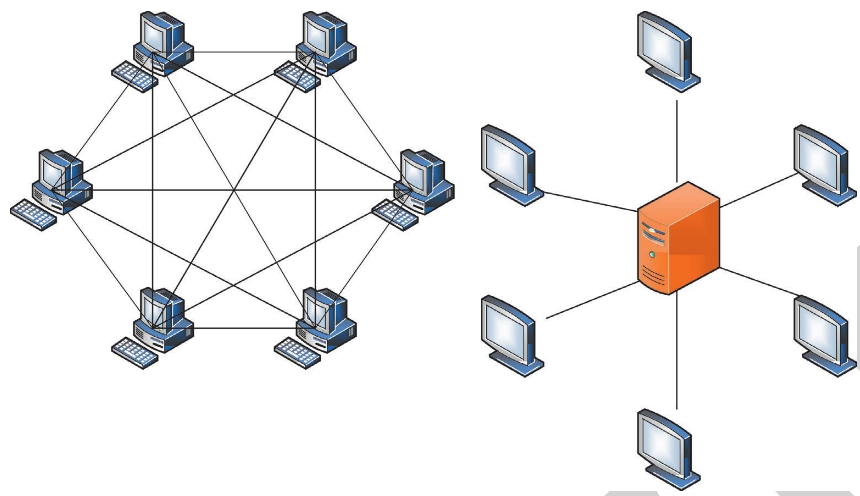
$$\overline{X} = \frac{\sum_{i=1}^{n} x_i}{n}. \quad (3)$$

In the formula, $\overline{X}$ is arithmetic mean

X_i is observed value, and

n is the number of observations in the sample.

For a grouped data, a single observation losses its individuality. The calculation formula of the arithmetic mean is



(a) (b)

FIGURE 4: P2P and centralized network mode. (a) P2P network model. (b) Centralized network model.

$$\overline{X} = \frac{\sum f_i m_i}{\sum f_i}. \tag{4}$$

In the formula, $\overline{X}$ is arithmetic mean,
f_i is frequency, m_i is group median.

(4) *Mean Absolute Difference*

$$M.A.\ D = \frac{\sum_{i=1}^{n} x_i - \overline{x}}{n}. \tag{5}$$

In the formula, $M.A.D$ is mean absolute difference,
X_i is the ith data in the incrementally sorted data,
$\overline{X}$ is arithmetic mean,
n is the number of observations.

For a large number of data, or the obtained information has been grouped, the calculation formula is

$$M.A.D = \frac{1}{n} \sum_{i=1}^{k} x_i - \overline{x} f_i. \tag{6}$$

In the formula, k is the number of groups.

(5) *Variance and Standard Deviation*

Ungrouped variance of the data:

$$S^2 = \frac{1}{n-1} \sum_{i=1}^{n} \left(x_i - \overline{x}\right)^2. \tag{7}$$

Ungrouped standard deviation of the data:

$$S = \sqrt{\frac{1}{n-1} \sum_{i=1}^{n} \left(x_i - \overline{x}\right)^2}. \tag{8}$$

If the data is divided into K groups, the formulas for variance and standard deviation are

$$\begin{aligned} S^2 &= \frac{1}{n-1} \sum_{i=1}^{n} \left(m_i - \overline{x}\right)^2 f_i, \\ S &= \sqrt{\frac{1}{n-1} \sum_{i=1}^{n} \left(m_i - \overline{x}\right)^2 f_i}, \\ n &= \sum_{i=1}^{k} f_i. \end{aligned} \tag{9}$$

In order to facilitate the calculation of S^2, another calculation formula is

$$S^2 = \frac{1}{n-1} \left(\sum_{i=1}^{n} m_i^2 f_i - n\overline{X}^2 \right). \tag{10}$$

(6) *Coefficient of Variation*

$$V = \frac{S}{\overline{X}}. \tag{11}$$

In the formula, V is the coefficient of variation and S is the sample standard deviation.

The values of the position quantity and the variation integral quantity of the coefficient of variation vary from zero to infinity. Using the coefficient of variation to measure risk is much better than using the number of locations and the number of variances alone.

2.2.4. Corporate Risk Measurement Indicators. Risk refers to the uncertainty of loss, and this uncertainty includes whether the loss occurs or not, when and where it occurs, and the extent of the loss is uncertain. Among them, whether the loss occurs or not and the extent of the loss are particularly important in enterprise risk management. The probability of loss is called the probability of loss, and the degree of loss characterizes the severity of the loss. In the enterprise risk measurement, it is reflected by the expected value of loss and the extent of loss.

The distribution law of the same risk unit is

$$P\{X = K\}\binom{n}{k}P^k q^{n-k}. \tag{12}$$

The probability of a risk accident in a unit with two or more risks is

$$\begin{aligned} P\{X \geq 2\} &= P\{X = 2\} + P\{X = 3\},\\ P\{X = n\} &= \sum_{i=2}^{n} P\{X = i\},\\ P\{X = K\} &= \sum_{i=2}^{n}\binom{n}{i}P^i q^{n-i}. \end{aligned} \tag{13}$$

Therefore, the expected value of X is

$$E(X) = np. \tag{14}$$

The standard deviation is

$$\sqrt{\mathrm{Var}X} = \sqrt{npq}. \tag{15}$$

It is assumed that a certain enterprise has many risk units, and it is estimated that an accident occurs in an average of λ risk unit each year. Each risk unit has the same probability of occurrence of accidents; then the number of lossy accidents occurring in a year X is a Poisson distribution with a parameter of λ, and the distribution law is

$$P\{X = k\} = \frac{\lambda^k e^{-i}}{k!}. \tag{16}$$

By solving it, the enterprise risk can be well estimated.

2.3. Digital Economy

2.3.1. The Status Quo of China's Digital Economy. Governments around the world pay more and more attention to the digital economy, so the economic development towards digitalization has become an irreversible trend. China's national-level digital economy development policies have also been promulgated continuously, and the development of digital industry awareness has continued to increase [27]. Under this trend, China's academic research on the digital economy has gradually deepened, and academic books and development reports on the digital economy have emerged one after another. The initiative mentioned that in the digital economy era, we must seize opportunities to meet challenges. In particular, it is necessary to explore specific paths and scientific strategies to promote the development of the world economy through the digital economy in order to promote the inclusive growth of the world economy. The drafting of this document has far-reaching significance for activating the global economy and promoting the development of the world economy [28].

2.3.2. The Traditional Economic Development Model Is Hindered. Since the reform and opening up, a series of major reform measures have laid the institutional foundation for the economic take-off in the future. As shown in Figure 5, the traditional investment-led economic circular development is an important driving force for economic growth. However, the real estate bubble in developed countries directly led to the excessive consumption of residents, causing the savings rate to drop to a historical low. China's entry into the WTO successfully matched its production capacity with the strong demand from overseas. Taking this as an opportunity, the real estate industry took advantage of the trend and formed a trend of rapid development with the aid of loose liquidity policies. Local governments have also invested in infrastructure construction after borrowing through financing platforms. The upstream heavy chemical industry, which is jointly promoted by the above two major needs, has developed rapidly. For example, China's main industrial products such as steel and flat glass rank first in the world. Therefore, it can continue to promote the sustained growth and development of China's economy. Demand at home and abroad has been amplified by leverage, guided by continuous high-intensity investment under high savings rates, and sufficient and cheap labor is constantly increasing. This continues to promote the sustained growth and development of the Chinese economy.

With the passage of time, the subprime mortgage crisis that began in the United States has had a negative impact on China's economic development. At the same time, the global economy has been caught in a development predicament. Although various local governments in China have begun to develop facilities on a large scale, they have neglected the optimization and improvement of the industrial structure. Capital is excessively concentrated in the real estate market, and the purchasing power of local residents is low. This has directly led to huge real estate inventories in some tier 3, 4 and tier 5 and 6 cities. It also illustrates the lack of attractiveness for capital from the side. In 2015, China's GDP growth rate was only 6.9%, the lowest level in the past 25 years. The following can explain the reasons that hinder the spiral development of the traditional investment economy from two aspects.

2.3.3. From "Investment Driven" to "Data Driven". In 2012, the Internet retail transaction volume exceeded the trillion yuan mark, giving us new hope. At the same time, the development of the digital economy is highly compatible with the supply-side structural reforms that the Chinese government is vigorously implementing. Through creating new jobs, restructuring the supply chain, reconsumption, and guiding reinvestment to carry out cyclical and gradual sustainable development. This provides a strong impetus for the healthy and sustainable development of China's economy. With consumer demand as the core driving force, it develops innovatively through the extensive use of a new generation of digital technology and the deep integration of the real economy. That is, the digital economy is gradually becoming an important driving engine for economic

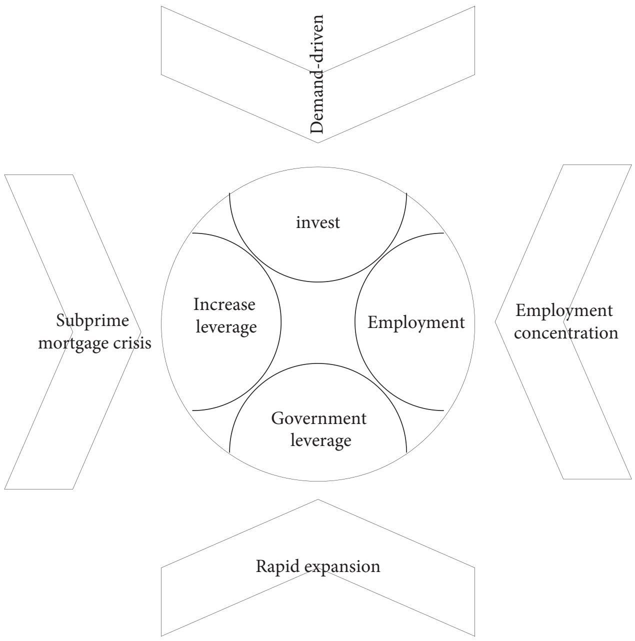


Figure 5: Spiral development of traditional investment economy.

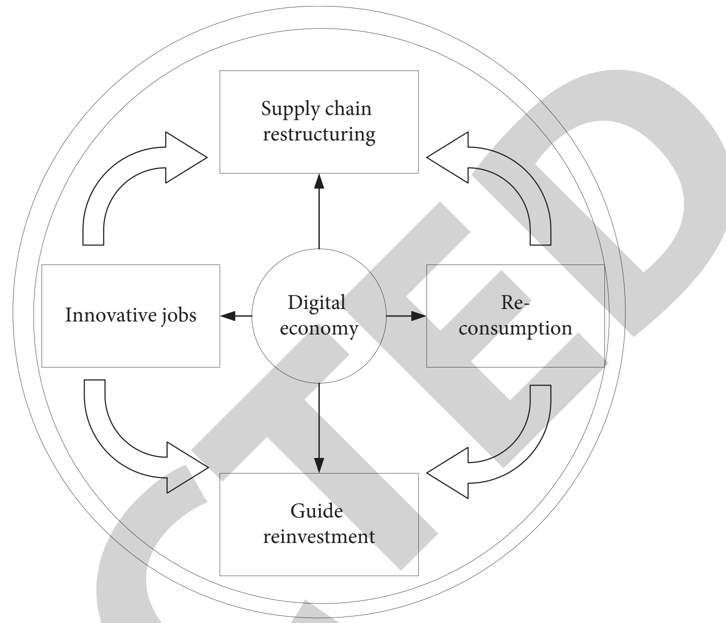


Figure 6: Circular sustainable development of the digital economy.

growth. As shown in Figure 6, the circular development of the digital economy is reflected in the following four aspects.

In traditional economic models such as real estate and infrastructure construction where investment dominates, investment is the main driving force of economic development. In the new digital economy development model, consumer demand is in a dominant position. Online retail, which is recognized and accepted by the general public, has become a strong driving force for economic growth. The online retail industry is only the tip of the iceberg in the development of the digital economy. It is expected that the digital economy market will be broader and richer in the future.

Under the guidance and support of national policies, the digital economy has developed rapidly in China, and the employment situation has undergone profound changes. It gave birth to a new model of flexible employment. and enabled the rapid development of new models such as the Internet economy and the sharing economy in the digital economy. It not only produced traditional employment, but also gave birth to new flexible employment models, such as self-employment, freelance, and part-time employment. Digital technology and Internet platforms have broken the boundaries of traditional corporate structures. It provides individuals with resources such as market, research and development, and production, which lowers the threshold for individuals to enter the market. It makes employment patterns flexible and diverse, and individuals do not have to enter traditional enterprises to engage in economic activities. Therefore, this model has become an important way to absorb employment. The rapid development of the digital economy is inseparable from the application of digital technology. Due to the increasing updating of digital technology, the computing power has been greatly improved, and the computing cost has also been greatly reduced. Data analysis and processing capabilities have also undergone tremendous changes so as to achieve the purpose of upgrading the employment structure.

3. Enterprise Risk Management Experiment

3.1. Empirical Evidence of Mature Enterprise Risk Management. The questionnaire is a commonly used research method for risk management research. There are three main advantages to using the questionnaire method for research. First, it is economical for large-scale data collection; secondly, the questionnaire can be standardized to facilitate analysis; finally, the content of the questionnaire is easy to understand for the subjects.

A total of 227 partially completed or fully completed questionnaires were collected. Because some questionnaires have unfinished parts, it is necessary to deal with the missing data before data processing. First of all, the questionnaires with many blanks are eliminated. After excluding many blank questionnaires, 162 questionnaires were completely completed or individual questions were blank. For the remaining 163 questionnaires, the missing data analysis was performed in STATA. It also uses the expectation maximization method to iterate to supplement the missing values. The number of iterations is set to 25, and variables whose number of cases are less than 5% are ignored. After supplementing the missing values, follow-up data analysis and model testing are carried out. In the end, 162 complete sample points were obtained.

The main body of this research is enterprises. Therefore, a basic description of the research sample of this study is carried out by describing the size of the company, the position of the interviewees in the company, and the ownership status. The sample situation is shown in Table 1.

From the above simple description of the data used in this article, it can be seen that in all interviewed companies,

Table 1: Sample description table.

Enterprise size			Interviewee		
	Frequency	Percentage		Frequency	Percentage
1000+	28	17.2	CEO	2	1.2
251–1000	31	19	CFO	3	1.8
101–250	38	23.3	Financial director	139	85.3
50–100	26	16	General counsel	1	6
11–25	20	12.3	Financial officer	9	5.5
26–50	16	9.8			
5–25	2	1.2			
2–4	1	6			
Total	162	100	Total	162	100

the scale of 100 people is the dividing line. This makes the proportion of enterprises with more than 100 employees and less than 100 employees basically equal. Therefore, in the actual data operation, we treat the size of the enterprise as a single dummy variable, and use 0 and 1 to represent the scale of more than 100 people and the scale of less than 100 people, respectively.

The respondents were mostly at the level of financial directors. Managers at this level have a first-line understanding of the company's financial data and at the same time have a more accurate understanding and grasp of the company's strategy, mechanism, and culture. It takes the interviewees at this level as the main target and can reasonably understand the relevant aspects of a company's risk management. In addition, more than 80% of the interviewees are at the level of chief financial officer. This ensures the relative unity of the survey subjects during the research and avoids the deviation caused by different management levels and different management focuses.

3.1.1. Reliability Test. Reliability refers to the degree of consistency of the results obtained when the same method is used for repeated measurement of the same object. Correlation coefficients are usually used to express reliability indicators. Reliability test is widely used and the effect is good, and it is adopted in this article. The specific statistics are shown in Table 2.

Table 2: Reliability test of enterprise risk management maturity model.

Variable	Cronbach's α	Number of items
ERMM	769	16
CGE	676	3
GM	804	7
CC	890	3
CS	800	8
CGC	825	4

After the reliability test, except for the corporate governance environment (CGE), the coefficients of all the research variables are obviously greater than 0.7, indicating that the reliability is high. The CGE is also at a level close to 0.7, which is also acceptable.

3.1.2. Partial Correlation Coefficient Matrix. Since there are many influencing factors for ERMM in this example, the partial correlation analysis is performed on the factors first, and the correlation (by observing the partial correlation coefficient, determine which independent variables have a greater impact on the dependent variable, and select them as factors that must be considered) between the independent variable and the dependent variable is observed. As for the independent variable with small partial correlation coefficient, the choice depends on the specific situation. Table 3 shows the partial correlation coefficient matrix between the dependent variable and the independent variable in the model in the first exploration.

At present, there are few studies in the literature that directly discuss the relationship between the corporate governance environment and corporate governance capabilities, so we will also explore this relationship here. Table 4 shows the reliability test of its extended model.

In this chapter, the industry, scale, and ownership are still under control. Then, partial correlation analysis is conducted to observe which independent variables have a greater impact on the dependent variables of ERMM and need to be retained in the model. Table 5 shows the partial correlation coefficient matrix between the dependent variable and the independent variable of the model in the second exploration.

It can be seen from the results in the table that after controlling the industry, scale, and ownership status, the maturity of corporate risk management has a very significant correlation with corporate governance environment, corporate governance capabilities, corporate resources, corporate technology, and corporate governance processes. The significant coefficients are all less than 0.05, so these factors can be placed in the research model analysis part for further analysis.

4. Supply Chain Financial Risk Analysis

4.1. The Needs of the Development of Supply Chain Finance Itself. From the perspective of financial institutions, the essence of supply chain finance is the "wholesale" of loans based on the implicit endorsement of core enterprises and the authenticity of customer information, which can reduce the risks of financial institutions. From the perspective of enterprises, it is the overall optimization of corporate

Table 3: Partial correlation coefficient matrix of variables in the enterprise risk management maturity model.

	ERMM	CGE	GM	CC	CS	CGC
ERMM	1.000	522***	430***	694***	539***	667***
CGE	522***	1.000	420***	544***	448***	577***
GM	430***	420***	1.000	339***	535***	408***
CC	694***	544***	339***	1.000	557***	819***
CS	539***	448***	453***	557***	1.000	618***
CGC	667***	577***	408***	819***	678***	1.000
Control variables: industry, size, and ownership						

***Confidence is 1%.

Table 4: Reliability test of the extension model of the enterprise risk management maturity model.

Variable	Cronbach's α	Number of items
Resource	871	6
Tech	751	4
CP	711	5

Table 5: Partial correlation coefficient matrix of variables in the extended model of the enterprise risk management maturity model.

	ERMM	CGE	GM	CC	CS	CGC
ERMM	1.000	529***	680***	470***	355***	500***
CGE	529***	1.000	577***	493***	258***	378***
GM	680***	577***	1.000	601***	453***	623***
CC	470***	493***	601***	1.000	331***	495***
CS	355***	258***	453***	331***	1.000	406***
CGC	500***	378***	623***	495***	406***	1.000
Control variables: industry, size, and ownership						

***Confidence is 1%.

resources in the supply chain to obtain corporate financing with low cost and high efficiency. At present, the relative amount of Chinese supply chain finance is not large. From the perspective of long-term development, there are still broad prospects for development. In the future, the development of supply chain finance will be manifested as the development of financial services on the one hand and will be manifested as the integration of the industry on the other hand. Therefore, supply chain finance 4.0 is about to emerge, which is the deep organic integration of industry and finance.

However, the development of supply chain finance will also face many problems. It troubles all parties involved in supply chain finance and affects the quality of its development. For this reason, we investigated the situation of its supply chain. The specific situation is shown in Figure 7.

From the figure, we can know that the amount of organization one before management is 6.28 million yuan, accounting for 1.66%; the amount of organization two is 52.8 million yuan, accounting for 1.79%; the amount of organization three is 38.28 million yuan, accounting for 1.7%; the amount of organization four is 26.9 million yuan, accounting for 1.9%; the amount of organization five is 67.09 million yuan, accounting for 1.82%; the amount of organization six is 80.66 million yuan, accounting for 1.78%; the amount of institution seven is 70.65 million yuan, accounting for 1.58%; and the amount of institution eight is 22.2 million yuan, accounting for 1.6%. After the management, the amount of institution one was 42.35 million yuan, accounting for 5.23%; the amount of institution two was 87.69 million yuan, accounting for 5.68%; the amount of organization three is 62.37 million yuan, accounting for 4.98%; the amount of organization four is 65.17 million yuan, accounting for 6.18%; the amount of organization five is 94.28 million yuan, accounting for 6.38%; the amount of organization six is 99.29 million yuan, accounting for 6.66%; the amount of institution seven was 81.36 million yuan, accounting for 5.29%; and the amount of institution eight was 64.29 million yuan, accounting for 5.81%. It can be seen that the funds of the enterprise supply chain after risk management have been significantly increased, and related risks can be avoided very effectively.

4.2. Blockchain Application Analysis. Under the traditional business model, each organization operates independently, and mutual data and information are in its own hands. And business transactions mainly rely on peer-to-peer trust relationships. If there is a problem with the trust of a certain organization, then there is a risk in the entire business process. For this reason, this article investigates the trust of blockchain technology in the actual transaction process of

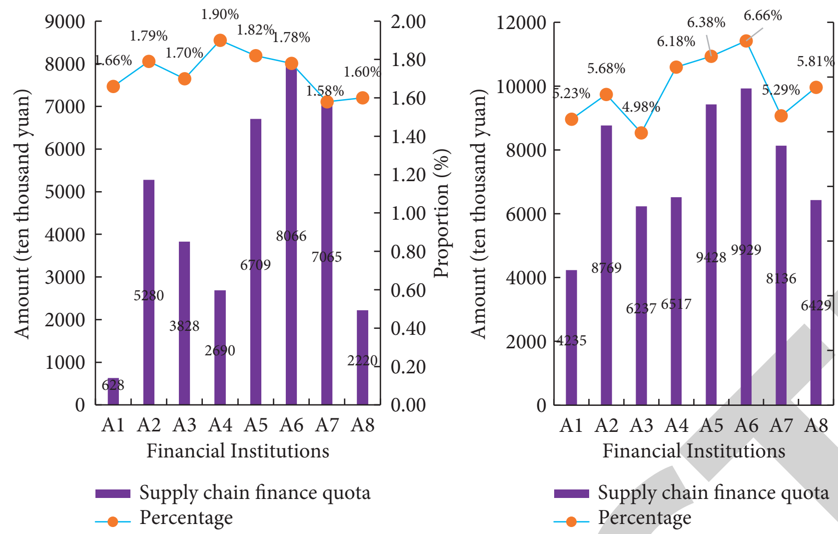


FIGURE 7: Supply chain of financial institutions and their proportions before and after management.

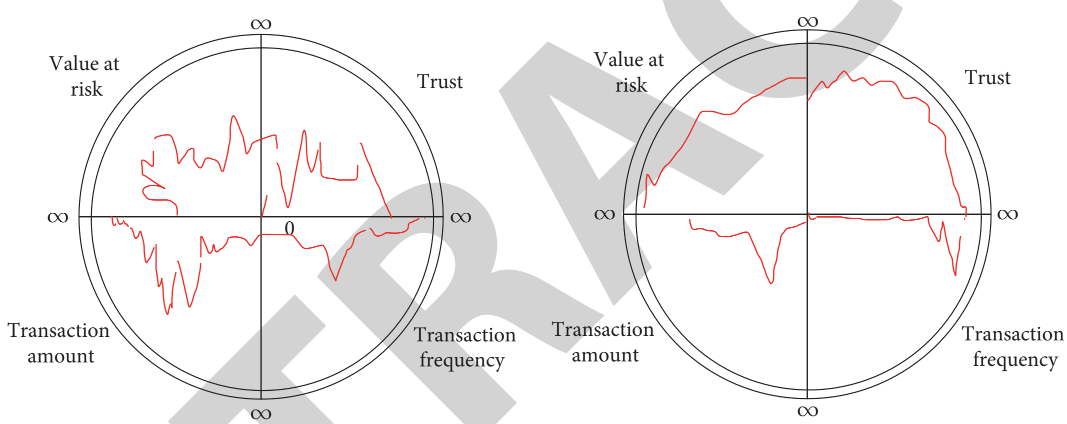


FIGURE 8: Comparison of transaction trust before and after empowerment.

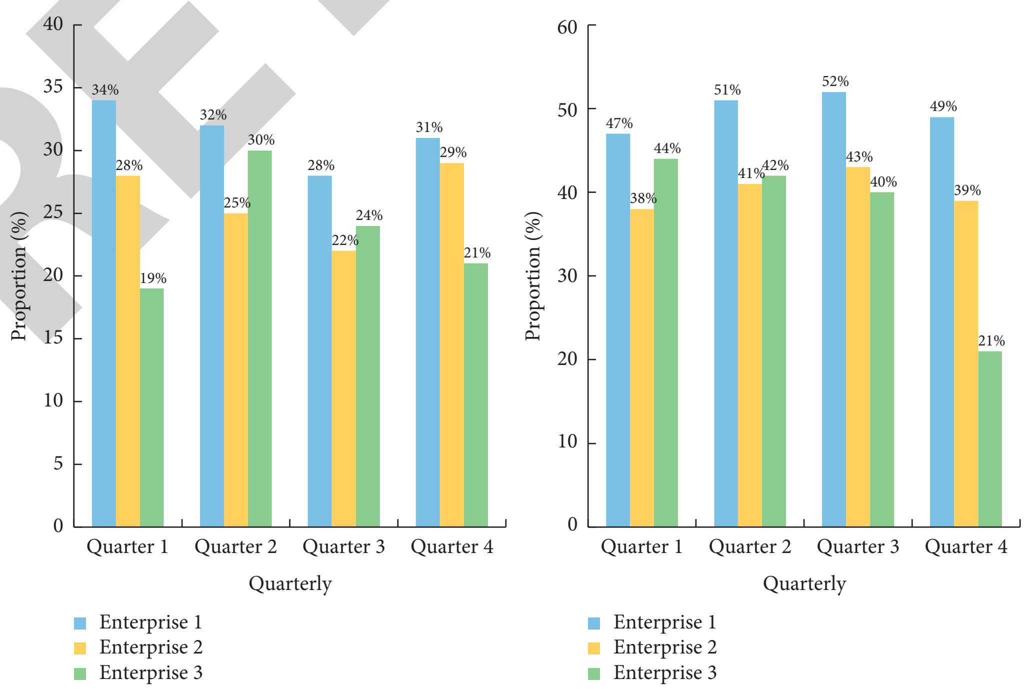


FIGURE 9: Transaction success rate in traditional mode and blockchain mode.

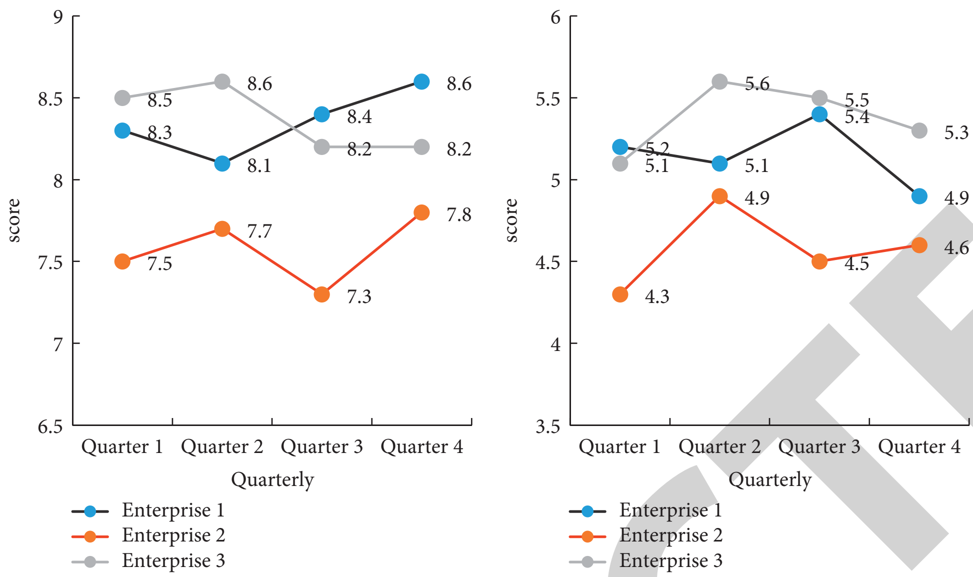


Figure 10: Comparison of company risk value scores before and after management improvement.

chain enterprises and compares and analyzes it with before empowerment, as shown in Figure 8.

It can be seen from Figure 8 that the trust degree after empowerment is obviously higher than that before empowerment, and the increase in trust degree will help the occurrence of risks in the transaction process. A high degree of trust indicates a high success rate in the transaction process, which is very effective for risk management. At the same time, in order to compare the payment success rate under the traditional mode and the payment success rate under the blockchain technology, this article makes a statistics on the transaction success rate of the three companies in the city during the four quarters of the transaction. It is shown in Figure 9.

It can be seen that under the traditional model, the transaction success rates of the next three companies in the first quarter were 34%, 28%, and 19%, respectively, while the transaction success rates under the blockchain model were 47%, 38%, and 44%; the transaction success rates of the next three companies in the second quarter were 32%, 25%, and 30%, respectively, while the transaction success rates under the blockchain model were 51%, 41%, and 42%; the transaction success rates of the next three companies in the third quarter were 28%, 22%, and 24%, respectively, while the transaction success rates under the blockchain model were 52%, 43%, and 40%; in the fourth quarter, the transaction success rates of the next three companies were 31%, 29%, and 21%, respectively, while the transaction success rates under the blockchain model were 49%, 39%, and 21%. It can be seen that the success rate of financial transactions in the blockchain mode has increased by 20%, indicating that the blockchain mode is very effective for risk management.

4.3. Comparative Analysis of Value-at-Risk in the Digital Economy. In the previous section, we compared and analyzed the parameters of other aspects of enterprises under the blockchain-enabled digital economy. In order to have an intuitive understanding of its specific risk value, this section compares the statistical risk scores of the three companies before and after management improvements, as shown in Figure 10.

As can be seen from Figure 10, before the management improvement, the company's risk value in the first quarter was 8.3, the second quarter was 8.1, the third quarter was 8.4, and the fourth quarter was 8.6; the company's risk value in the second quarter was 7.5, the second quarter was 7.7, the third quarter was 7.3, and the fourth quarter was 7.8; the company's risk value for the first quarter was 8.5, the second quarter was 8.6, the third quarter was 8.2, and the fourth quarter was 8.2. The overall stability is around 8.0, and the risk score is relatively high. After the management improvement, the company's risk value was 5.2 in the first quarter, 5.1 in the second quarter, 5.4 in the third quarter, and 4.9 in the fourth quarter; the company's risk value in the second quarter was 4.3, the second quarter was 4.9, the third quarter was 4.5, and the fourth quarter was 4.6; the company's risk value for the first quarter was 5.1, the second quarter was 5.6, the third quarter was 5.5, and the fourth quarter was 5.3. The overall stability is around 5.0, and the risk score of this degree is very low.

Based on the above analysis, we can conclude that the chain enterprises that empower the digital economy in the blockchain have a very good effect on strengthening risk management. The risk has been reduced by 35%, which can be used well in the risk control of chain enterprises.

5. Conclusions

This article mainly studies the strengthening of risk management of chain enterprises under the empowerment of blockchain in the digital economy. First of all, this article has carried out a detailed understanding of blockchain technology and redesigned the risk measurement scheme of chain enterprises. This can be very effectively applied to the risk estimation of chain enterprises to avoid high-risk behaviors. This has also initiated a certain degree of understanding of the digital economy, and then an experiment was designed to test the enterprise's risk management model. This article also conducts a comprehensive analysis of relevant parameters in the analysis part, effectively avoiding corporate risks.

Data Availability

No data were used to support this study.

Conflicts of Interest

The author declares that there are no conflicts of interest with any financial organizations regarding the material reported in this manuscript.

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