


## Research Article

# Analysis of Platform Economic Supervision Mode from the Perspective of Blockchain

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In order to analyze the supervision mode of the platform economy from the perspective of blockchain, a blockchain-based method is proposed for the supervision mode of the platform economy. First, in terms of the speed of data collection, the economic monitoring and forecasting based on network big data are real-time from data acquisition to data analysis, so that problems can be detected earlier and serve the purpose of early warning of economic monitoring and forecasting; secondly, in the scope of data monitoring, data that has not been monitored in traditional fields becomes possible; thirdly, in data mining analysis, it can reflect more unpredictable knowledge laws. It proves that from the perspective of block chain, the platform pays the highest attention to the two indicators of taxation and establishment, accounting for 31.10% and 24.38%, respectively. The platform economic supervision model can also find certain correlations from the massive data and then analyze the laws of economic operation and find the influencing factors behind the phenomenon, so as to serve the supervision model.

## 1. Introduction

At present, the use of big data for economic supervision has attracted considerable attention, and its advantages in research, such as timeliness, accuracy, relatively low cost, high granularity, and large sample size, make it more and more widely used. Traditional supervision mainly relies on statistical report data, and there are problems such as lag in release and insufficient sampling accuracy, and many emerging industries are not within the scope of statistics, which have directly or indirectly affected the timeliness and scientificity of macro-decision-making. Scientific application of big data concepts and technologies, mining and utilization of Internet data resources, enriching sources of statistical data, and more accurate monitoring and forecasting of economic operation are of great significance for improving the scientific decision-making level of macrocontrol [1].

Blockchain technology is a new generation of disruptive core technology following steam engines, electricity, and the Internet. It uses the principle of distributed accounting to store data and has attracted the attention and exploration of many

financial institutions with its decentralized payment and clearing functions. The main application mode of the blockchain 1.0 stage is electronic currency. In the blockchain 2.0 stage, the network of financial asset issuance, the intelligent settlement, and transaction process are realized, and the payment and transfer can be seen in real time. The application scope of the blockchain 3.0 stage will be further expanded, and the information representing the value can be stored quantitatively to realize the on-chain tracking and transaction of assets, as shown in Figure 1.

## 2. Literature Review

With the popularization and development of Internet technology, the platform economy has been applied to all walks of life, gradually subverting the concept and business model of the traditional market. However, with the development of the platform economy, the fast-growing takeaway and car rental platforms in China have begun to expose a crisis of trust. The platform initially tried to maintain the trust mechanism within the platform through a reward and punishment system.

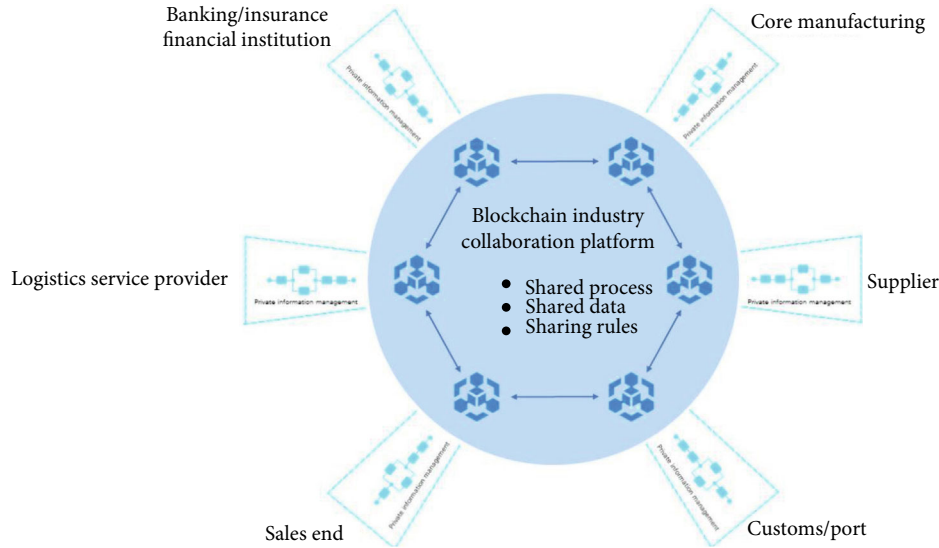


FIGURE 1: Integration of blockchain technology and Internet platform.

With the in-depth development of the platform economy, technologies such as big data algorithms and databases are applied to platform construction [2]. Blockchain is favored by network platforms due to its immutability, decentralization, openness, transparency, etc., to solve the problem of consumer trust mechanism [3]. The embedding of blockchain technology improves the technical support for building the platform's economic trust mechanism and improves the credibility and efficiency of the platform's information or value transactions [4]. Through the analysis of the platform economy to improve user trust and the action paths of its various influencing factors, it puts forward suggestions for platform companies to create a good trust environment and attract users to participate in the cocreation of the platform mechanism, which is aimed at promoting the construction of the trust mechanism of the platform economy.

Foreign scholars Shen and Law believed that from the perspective of platform users, the methods of establishing a platform with both reputation system and trust include establishing trust clues based on transactions, trust clues based on user profiles, trust clues based on identity authentication, and implicit information-based trust clues [5]. Buettner found that most people take the reputation of the platform as a clue of trust [6]. Coron and Nielsen pointed out that the technical quality of the platform has a great effect on the induction of trust, and the platform can also add third-party technology to the platform's trust mechanism. The algorithms embedded in the platform and the technology used are to serve users. The better the user experience is, the higher the user's trust in the platform will be [7]. Tao and Cui discussed whether the blockchain can be added to the platform economy through the platform's built-in algorithm to improve the trust mechanism [8]. Zhou discussed the inadequacies of today's data market security and introduced blockchain as a solution [9]. From the perspective of enterprise data transactions, Xu constructed a

blockchain-based data market to verify the integrity of data transactions [10]. Bonnafous realized a data market for IoT device transactions based on the Ethereum blockchain [11]. Cao et al. designed a multilayer blockchain framework based on an intelligent mobile data marketplace to address related privacy, security, and scalability challenges [12]. Li and Wan studied the watermarking problem in the context of big data transactions based on the Ethereum blockchain [13]. Gonzalez et al. used web search data to study quarterly unemployment rate, showing that the unemployment rate forecast based on web search data can reflect the trend change of unemployment rate earlier than official data [14]. Caria introduced blockchain technology into the data market, which improved the transparency and security of data transactions [15]. Sz and Jhl analyzed blockchain technology and believed that it could become a new mechanism to protect personal privacy [16]. Since then, Zhao has elaborated on this issue in detail [17].

On the basis of the current research, a platform economic supervision model from the perspective of blockchain is proposed. The platform economic supervision model can also find certain correlations from massive data and then analyze the laws of economic operation and find out the influencing factors behind the phenomenon, thus serving the regulatory model.

### 3. Platform Economic Supervision Model Based on the Perspective of Blockchain

#### 3.1. Blockchain

**3.1.1. The Definition of Blockchain.** The concept of blockchain was first proposed by Satoshi Nakamoto, the founder of Bitcoin, and its meaning is based on one or several algorithms. Unknown information is stored in newly created blocks using the common confirmation of existing blocks or nodes in a shared database [18]. The operation and

maintenance of the blockchain are completely automated without manual operations, and the information in it is identified by all blocks in the chain, and it is almost impossible to tamper with information by changing a certain block [19]. Therefore, the blockchain has the characteristics of immutability, decentralization, and collectivity. Blockchain is actually the application of a variety of technologies, including cryptography, computer network technology, and information sorting technology. The joint cooperation of these technologies improves the operation mode of the blockchain, making it nontamperable and without intermediaries when recording information. The overall technical framework structure is shown in Figure 2.

Specifically, blockchain technology uses cryptography to associate any node in the library to form all data blocks containing a certain period of time and generates keys to ensure that the data cannot be changed and can be linked to external areas block or command. For example, in the Bitcoin operation system, each block contains all Bitcoin transaction information and detailed data within a certain period of time, and new blocks are generated every certain period of time to continuously record the information. The schematic diagram of blockchain operation is shown in Figure 3.

### 3.1.2. Characteristics of Blockchain

(1) *Decentralization.* Decentralization is the core attribute of blockchain. The blockchain can use many blocks to record and save all the data contained in the database in a distributed manner, thus eliminating the need for a centralized data processing center and ensuring the authenticity and accuracy of the data. Different from the centralized network structure, the blockchain can form a connection network through the P2P protocol, and the computers connecting each block in the network are in an equal state. Every computer has the same rights and obligations, and there is no data collection center or core delivery server [20]. All nodes in the blockchain connection network conform to the same cryptographic rules, and each block cooperates with each other to ensure that all data records in the network are accurate and stored securely [21]. And every data storage request must be approved by all blocks before proceeding to the next step.

(2) *Transparency of Data and Operations.* Blockchain is actually an application of distributed ledger technology. All blocks in the network record all data and operations that have occurred, which means that all information is transparent [22]. At the same time, the blockchain ensures the openness of information in the chain through the use of various encryption algorithms and other cryptographic technologies, which lays the foundation for the generation of blockchain trust characteristics. Moreover, the application of these technologies and methods enables the information in the entire blockchain to be consulted and tracked.

(3) *Immutability of Information.* Once the data in the blockchain is verified and recorded by all blocks, it cannot be changed. In a blockchain, all data records must be censored by all blocks in the network before they are recorded [23].

That is to say, only by controlling 51% of the blocks in the entire network and making data changes at the same time, there is a certain possibility of tampering. But in the entire blockchain, the probability of controlling 30% of the blocks is close to zero. Therefore, it is unlikely to change the data that has been recorded and thus will not affect the data security of the overall ledger of the entire network. This immutable nature ensures the stability, security, and reliability of the blockchain.

(4) *Anonymity.* In the complex Internet environment, the use of blockchain can solve the problem of lack of trust in each connection point in the network, and each connection point transaction party can conduct transactions without knowing the basic information of the other party. And in the blockchain, all transactions have been encrypted with addresses, and the identities of transaction participants will not be exposed. The blockchain uses the public key and the private key to encrypt or decrypt data [24]. An account first uses the private key to encrypt the data information and then send it to the public network. Only the corresponding public key can be decrypted to ensure information security. As shown in Figure 4.

### 3.1.3. The Risk of Blockchain Supervision

(1) *Weakening the Role of the Central Bank.* Digital currency is based on distributed ledger technology, which affects the issuance of physical currency. The money supply and inter-bank settlements will no longer require the central bank, reducing the central bank's role in maintaining financial stability. From the technical point of view, the total amount of digital currency has been determined at the beginning of issuance. The standard denominated in the main currency changes every day, and the monetary policy loses its effectiveness [25].

(2) *Challenging the Existing Legal System.* As an emerging digital currency technology, blockchain is still in the legal void. At present, there are no standards and institutional norms specifically for blockchain, there is no corresponding legal basis for the establishment and operation of blockchain financial platforms, and there is no unified standard for technical solutions. There may be criminals using loopholes for illegal fundraising and online money laundering. When using the blockchain for transactions, the rights and obligations of both parties are not clearly defined, and there is a lack of protection of the rights and interests of financial investors.

(3) *Challenging the Information Monitoring Capabilities of Existing Regulatory Systems.* The future of blockchain development is to connect with the financial system or even replace the existing system, and all information should be transparent to the regulator. However, its information encryption and user anonymity bring difficulties to the data analysis and transaction chain tracking of the supervision system. How to overcome the technical characteristics of blockchain decentralization and integrate centralized supervision technology is a systematic project.

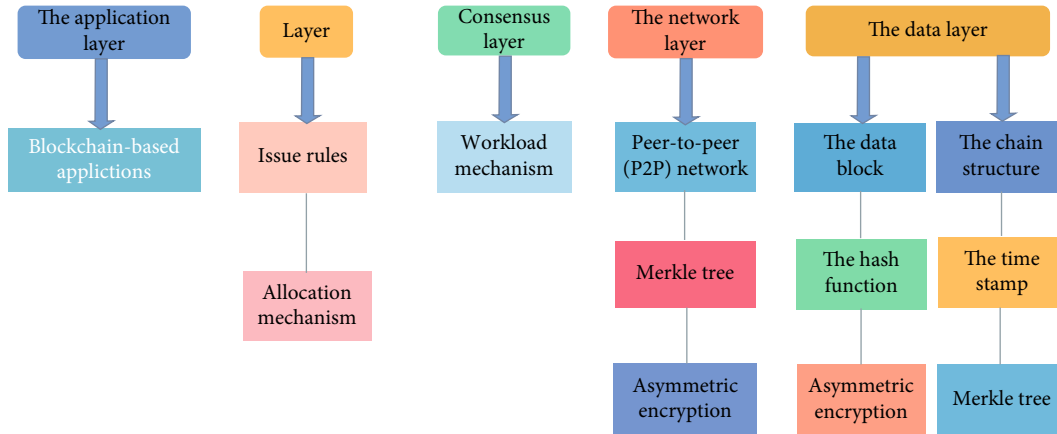


FIGURE 2: Blockchain technology architecture.

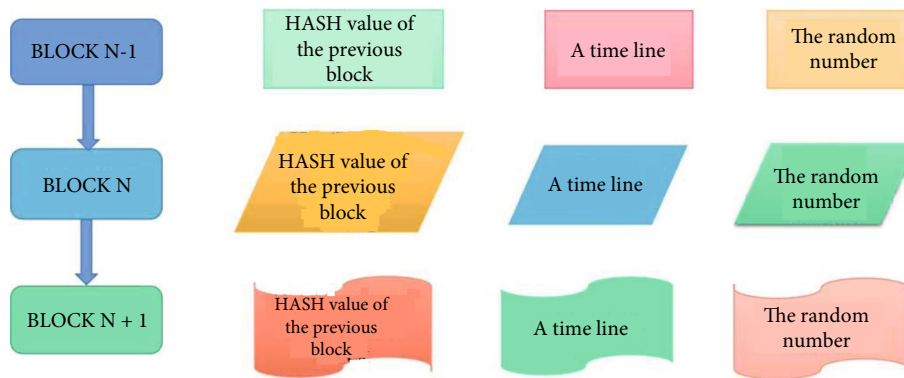


FIGURE 3: Schematic diagram of blockchain operation.

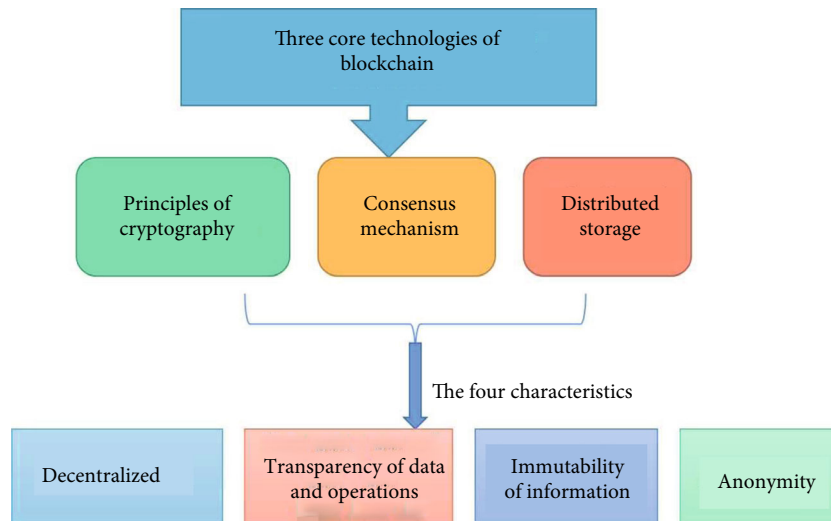


FIGURE 4: Characteristics of blockchain.

3.1.4. Establishing a Blockchain Big Data Supervision Platform.

In order to reduce the risks in the blockchain integration business, a big data supervision and analysis platform can be built (as shown in Figure 5), the existing data storage and computing capabilities can be improved, and the market monitoring tools can be improved. At the same time, it breaks the barriers

of various business systems such as deposit insurance, account management, credit monitoring and management, and anti-money laundering supervision and conducts a comprehensive analysis of the characteristics of various historical data stored in the blockchain. The multidimensional map of financial business participants is constructed through data mining

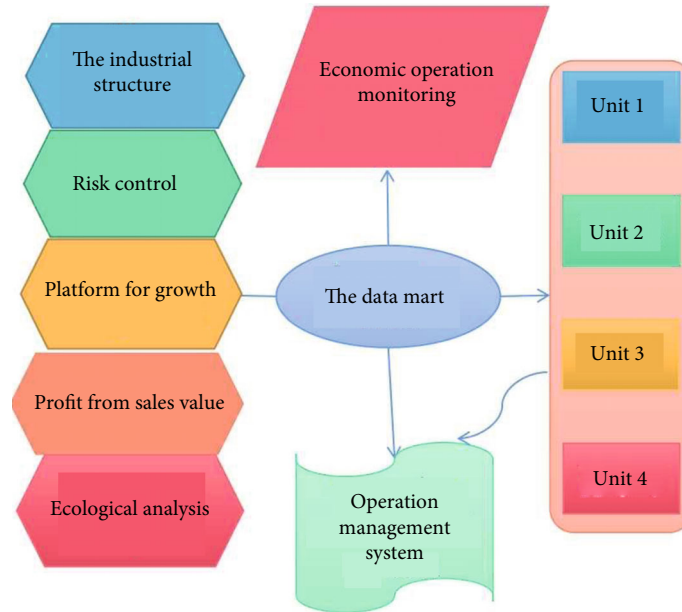


FIGURE 5: Big data supervision and analysis platform.

algorithms, machine learning, and other technologies, and illegal acts such as financial fraud and fund embezzlement are effectively identified through prudent crossargumentation [26]. At the data analysis layer, institutional and regulatory rules can be encoded into the blockchain to generate smart contracts. Automatic compliance review of transaction terms and illegal or suspicious transactions can be backtracked or blocked. Smart tax deductions can also be embedded in the platform to reduce intermediate links in tax payments. Using the anti-money laundering evaluation model to score the transaction flow in the blockchain can measure the money laundering risk of a specific institution. At present, the business systems in use by the central bank have access interfaces for financial institutions, and the blockchain is based on the Internet. Once a hacker attacks and virus infections occur, the risk spread will be faster and more uncontrollable. In order to improve the availability of business systems and ensure financial stability, VPN access can still be considered for related applications of blockchain. The core business system uses the “active-active” disaster recovery architecture and real-time automatic incremental backup to improve the security of secret keys and certificates, strengthen the authenticity of identity authentication, and avoid the vulnerability and shortcoming of lost secret keys. The system background real-name is bound to single sign-on, and full log recording is enabled.

3.1.5. Analysis of Platform Economic Trust Mechanism and Its Influencing Factors from the Perspective of Blockchain

(1) Platform Economy Trust Mechanism. The platform economy is a new economic model that links two or more specific groups. A “decentralized” channel is built between participants and a new economic model that provides them with a specific mechanism to profit from it. Participants can

conduct transactions or exchange information on the built platform. Based on this, the platform hopes to establish an environment where users can trust each other, so as to build a trust mechanism within the platform by setting up a series of functional services, background services, reward and punishment rules, and the platform’s own brand trust. As the core of the platform economy, the platform is a decentralized channel that links all parties involved in the platform economy. It can be a business trade platform, a knowledge question and answer platform, a rental platform, a takeaway platform, etc. The transaction parties in the platform economy are unfamiliar with each other, the transaction is not conducted face to face, and the issue of trust between the two parties is the first obstacle to the transaction. The trust environment created by the platform directly affects the transaction or use behavior of users on the platform; platform companies create a good trust environment from within the platform companies by setting the operating rules, systems, and functions of the platform [27]. Based on the above analysis, the platform economy is a new business model in which all parties and the platform create value together. It relies on the social interaction between the parties for information exchange and data sharing, as shown in Figure 6.

(2) The Influencing Factors of Internal Trust in the Platform Economy.

- (a) Blockchain technology. Before the application of blockchain technology, the construction of platform economic trust mechanism was realized through social interaction between users. The emergence of blockchain technology makes it possible for users to trust the platform without interaction, and blockchain technology can act as the current “objective

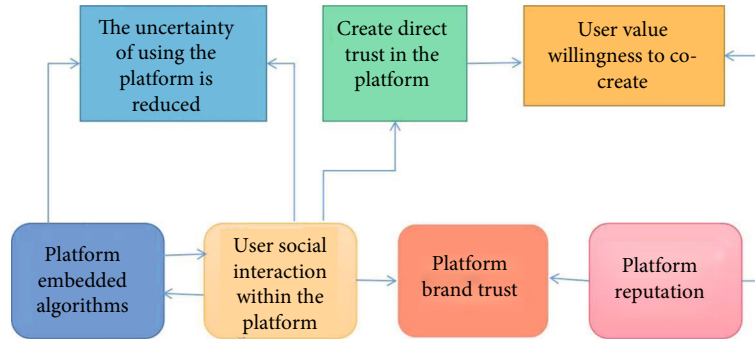


FIGURE 6: Platform economic trust mechanism.

third party” status. Users will be assured of data or value transactions on the platform because of the existence of this technology. Blockchain technology is a technology that can effectively support supply chain transparency. Blockchain technology offers possibilities for supply chain management and sustainable supply chains. Blockchain technology also facilitates the rapid enhancement of trust and collaboration among all parties involved in the supply chain environment. For example, in an e-commerce platform, the blockchain can record the supply chain information of goods in real time, and these records cannot be tampered with, ensuring the authenticity of the user’s perception of the quality of the goods. The platform combines the participants in the supply chain and the logistics company to form a blockchain alliance to track and trace the transaction throughout the whole process and to record the user data securely, in order to provide users with commodity traceability services and improve users’ trust in the platform. Because of its immutability, decentralization, openness, and transparency, blockchain provides a safe and tamper-proof tool for data storage and value transactions, which can securely record platform user information, transaction information, and transaction item information [28]

- (b) Social interaction of platform users. The social interaction between platform users will reduce the unfamiliarity among the participants, increase the users’ cognition of the platform and transactions, and then improve the users’ trust in the platform and the willingness of users to participate in the value cocreation of the platform. Increasing the efficiency of social interaction between users will make it easier for users to obtain various trust clues, improve the matching degree of information, and then make platform users have a good sense of experience. At the same time, social interaction among platform users will affect other influencing factors, and platform companies need to coordinate management of all influencing factors to improve the level of trust in the platform economy
- (c) Brand trust and reputation of the platform. Brand trust makes consumers trust the platform to which the brand is sold. Reputation is the degree of favorability of a platform in the minds of consumers, which affects consumers’ desire to become users and their willingness to participate in the value cocreation of the platform. The main factors that generate brand trust in the platform economy field are the brand recognition of the platform, the online social interaction of users on the platform, the brand image of the platform, and the reputation or word-of-mouth of the platform. The quality of products or services provided by the platform is the key to affecting the trust of the platform. The better the user experience, the more brand perception that is conducive to platform brand trust. That is, the better the service quality of the platform, the easier it is for users to have brand trust in the platform. The higher the platform experience favorability and the more active the user’s social activities, the more the platform users’ trust in the platform’s brand can be enhanced, and the platform’s reputation can be improved. That is to say, in the platform economy, the higher the user’s trust in the platform brand, the higher the platform’s reputation, and the more the user’s trust in the platform will be. At the same time, all parties involved are cocreating value with the platform, and customer participation in the cocreation of platform brands is promoting platform trust. The direct trust generated by consumers who experience the services or products of the platform brand in person or the indirect trust generated by the recommendation of other users will increase the platform trust
- (d) Platform embedded algorithms and databases. The algorithms and databases embedded in the platform are the technical support strength of a platform, and the database of the platform is the core of the competitiveness of a platform. The social interaction function also requires the support of technology to be realized. The more comprehensive the functions of the platform, the more it can meet the needs of users, and the more it can increase the trust of users. At the same time, the database can also enhance the user’s trust.

The higher the user’s perception of using the platform’s security, the higher the user’s trust in the platform. Therefore, whether the platform’s embedded algorithm is optimized or not and whether the platform database data pays attention to user information security will affect user trust. The traditional consumer credit game model and the blockchain credit game model are shown in Tables 1 and 2

#### 4. Construction and Empirical Analysis of Platform Economic Monitoring and Forecasting Index Based on the Perspective of Blockchain

##### 4.1. Construction of Economic Monitoring Forecast Index

4.1.1. *General Analysis Ideas.* This paper explores the use of network search data, studies the construction of an index model, realizes the real-time acquisition of the platform’s economic status evaluation data, reflects the hot issues and trends that the platform is concerned about in time, and provides an important reference for government and enterprise decision-making. Considering that most of the platform’s business decision-making behavior is based on individual behavior. The Baidu Index searched by netizens can reflect their subjective wishes, and the economic condition index can be studied by using search big data. According to the 10 dimensions used in the World Bank’s business performance indicator system (including starting a business, handling construction permits, obtaining electricity, registered capital, obtaining credit, small and medium investor protection, taxation, crossborder trade, contract enforcement, and bankruptcy), combining the seven dimensions of the “Business Environment Report for Chinese Enterprises” (including starting a business, applying for licenses, obtaining credit, sharing resources, paying taxes, protecting legal rights, and protecting intellectual property rights), 8 analysis dimensions are established, such as starting a business, handling construction permits, obtaining credit, registered capital, taxation, bankruptcy handling, sharing resources, and intellectual property protection and establishing an indicator system. The construction of economic monitoring forecast index is shown in Figure 7.

4.1.2. *Data Processing Route.* This paper determines the research ideas. The key steps of data processing using Internet big data include data acquisition, data screening, and data preprocessing.

(1) *Acquisition of Original Data.* Data acquisition mainly refers to network information extraction and transformation, which is used to extract unstructured text information on the network and convert it into structured numerical data, which is the premise of subsequent analysis. The network information extraction can be summarized as the web crawler method and the search engine index method. The web crawling method refers to the method of automatically grabbing the text information of the web page and then using the natural language processing method to obtain the structured data. The law of search engine index refers to

TABLE 1: Traditional consumer credit game model.

Financier Investor	Default	Not default
Investing	$-I, 0$	$Ir, R - I$
Not investing	$0, 0$	$0, 0$

TABLE 2: Blockchain credit game model.

Financier Investor	Default	Not default
Investing	$-I, -D$	$Ir, R - I$
Not investing	$0, -B$	$0, 0$

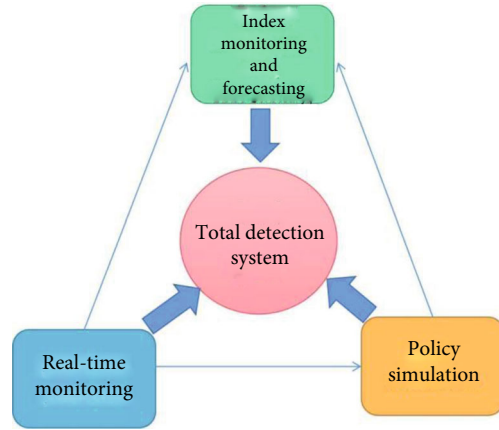


FIGURE 7: Construction of economic monitoring forecast index.

the method of directly obtaining data using search engine index. This research uses Baidu search index as public data.

(2) *Keyword Filter.* Due to the large amount of search data obtained from Baidu Index, and not all search data is related to the operation of the platform, it is necessary to use relevant features to extract keywords with high relevance. In the existing research, keyword selection can be summarized into two methods: subjective word selection and model word selection. Subjective word selection delineates the scope of keywords based on empirical research and then determines the final keywords according to the actual effect. The model word selection determines the final keyword according to the algorithm. This paper obtains the big data keyword indicators for the evaluation of platform economic supervision status through three steps. The first is to establish a keyword database, use web crawler technology to crawl keywords derived from the initial keywords, and eliminate duplicate keywords with less data. The second is to select keyword indicators. Calculate the monthly average search volume based on the daily search volume of each keyword, calculate the correlation between keywords, and filter the keywords accordingly. The third is to judge the representativeness of

the selected keyword indicators. It is necessary to test whether the correlation is significant with the more authoritative statistical indicators and finally select the search keywords. The higher the search rate of the keywords “construction permit, credit, tax reduction, shops, intellectual property rights,” the higher the improvement of the enterprise’s operating conditions, and the higher the search rate of the two search keywords “registered capital, bankruptcy,” indicating that the improvement of the enterprise’s operating conditions is worse, as shown in Table 3.

(3) *Data Preprocessing*. By eliminating the long-term trend influence of the original search volume sequence caused by the rapid development of the Internet and after further filtering the keyword data and reducing the frequency of the data, the high-frequency and low-frequency search heat indicators of related keywords are finally obtained. This article uses the Baidu Index to obtain the monthly search data for each keyword in 2018. The obtained Baidu Index search data has been smoothed by the moving average method, eliminating short-term volatility and seasonal effects. The Z-score standardization method is further used to standardize the raw data of the indicators. The processed data conform to the standard normal distribution, and the transformation function is shown in formula (1) as follows:

$$X_i = \frac{X_i - \bar{X}_i}{\sigma_{X_i}}. \quad (1)$$

Among them,  $X_i$  is the standardized processing value,  $X_i$  is the original data value,  $\sigma_{X_i}$  is the standard deviation of the  $i$ th keyword, and  $\bar{X}_i$  is the average of the  $i$ th keyword.

4.1.3. *Compilation and Synthesis of Index*. The index compilation method mainly solves the problem of how to quantify the text information. The index synthesis is mainly based on the quantitative model. The simpler index synthesis method is the commonly used prosperity weighted synthesis method.

(1) *Determination of Weights*. Existing index weighting methods based on network data are mainly weighted according to the correlation coefficient; that is, the correlation coefficient is directly used as the basis for weighting. The weight is determined by the coefficient of variation method. The coefficient of variation method is to directly use the information contained in each index to obtain the weight of the index through calculation, which is an objective weighting method. The weight formula (2) is as follows:

$$W_i = \frac{P_i}{\sum_{i=1}^p P_i}, \quad (2)$$

$$P_i = \frac{\sigma_{X_i}}{\bar{X}_i}.$$

Among them,  $P_i$  is the coefficient of variation of the  $i$ th

TABLE 3: Selection of keywords for classification indicators.

Classification indicator	Keyword selection
Apply for a license	Construction permit
Get credit	Credit
Tax	Tax cut
Registered capital	Registered capital
Shared resource	Shop

keyword,  $\sigma_{X_i}$  is the standard deviation of the  $i$ th keyword, and  $\bar{X}_i$  is the average of the  $i$ th keyword.

(2) *Calculation of Index*. The monthly search index of the keywords selected above is weighted and averaged to obtain the monthly private enterprise operating condition index (Doing Business Index, DBI). The calculation formula (3) is as follows:

$$DBI = \sum_{i=1}^i W_i X_i - \sum_{j=1}^j W_j X_j. \quad (3)$$

Among them,  $W_i$  is the weight of the  $i$ th positive index, and  $X_i$  is the search rate of the  $i$ th positive index.  $i$  and  $j$  represent the number of factors that are positively and negatively correlated with the operating conditions of the enterprise, respectively.

(3) *Prediction and Application of Index*. The quantitative model between the traditional benchmark index and the search index is established, and the fitting degree of the two is analyzed through time series analysis methods such as Var. There are two very common situations in the econometric modeling of classical time series. One is that the time series studied is stationary and can be directly modeled and analyzed; the other one is that the studied time series have a cointegration relationship. After modeling, a cointegration test is performed to determine the validity of the established model. Since the subindices lack the training set for simulation comparison, this paper directly conducts cointegration analysis on the time series data to obtain the final trend line.

4.2. *Empirical Analysis*. Based on the above analysis steps, this paper uses the number of daily searches of the main characteristic keywords in 8 dimensions to build a platform economic status index model, which can reflect the monthly change trend of the platform economic status.

4.2.1. *The Overall Trend of the Platform Economic Operating Condition Index*. Figure 8 reflects the trend of the platform economic situation from January to December. It is found that the platform economic situation from January to December presents an inverted “U”-shaped trend of “high in the middle and low at both ends,” reaching the highest point in April and the lowest point in October point. Through the fitting, it is found that the change trend of the index is consistent with



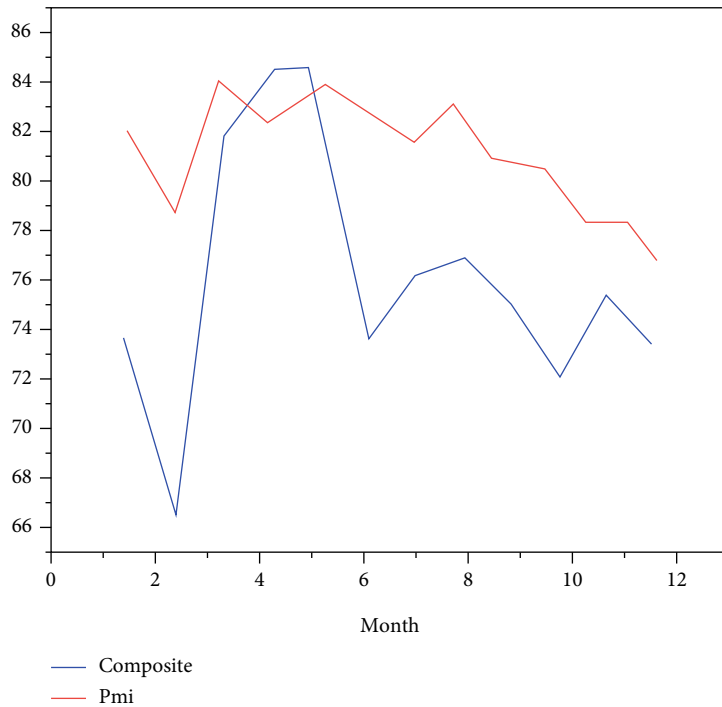


FIGURE 8: Comparison of the change trend of the platform economic condition index and the trend of the purchasing index.

the trend of the manufacturing purchasing manager index, which can reflect the trend of market operation to a certain extent. At the same time, through the calculation of the national platform economic situation index, it is found that the platform economic situation index of a certain city is 12.83 points higher than the national average.

According to calculations, in the composition of the platform economic condition index, the platform pays the highest attention to the two indicators of taxation and business establishment, accounting for 31.10% and 24.38%, respectively (see Figure 9), followed by licensing and credit.

4.2.2. *The Trend of the Subindex of Platform Economic Conditions.* The trend of each subindex is shown in Figure 10 and Table 4. The specific analysis is as follows:

(1) Launch of the platform

It can be seen that from March to July after the Spring Festival is the peak period for the establishment of the platform; especially, the registration of the platform shows an explosive growth during this period. Among them, the platform registration process, platform registration information query, and industrial and commercial registration verification are the information with high attention. After entering the second half of the year, the search index of launching a platform showed a relatively obvious decline, indicating that the platform’s willingness to launch a business has decreased, which is related to the downward economic development situation to a certain extent, and needs to be paid attention to. After inspection, the trend of the index is consistent with the trend

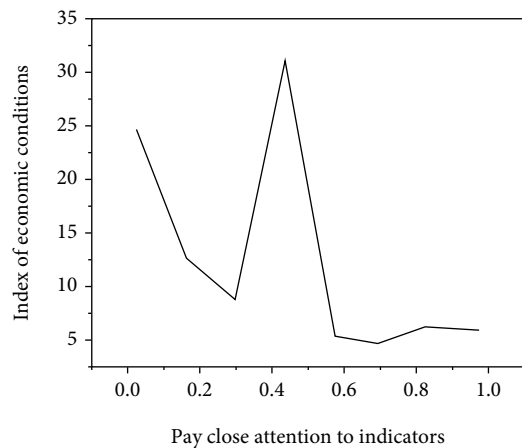


FIGURE 9: Indicators that the platform pays attention to.

of the market entities of the new registration platform. After the band is elongated, compared with other places, the fluctuation range of this indicator is larger (see Figure 11), indicating that it is more obviously affected by policy and market environment factors.

(2) Application of a license

The issues that enterprises pay more attention to are the conditions and procedures for applying for construction permits. From the perspective of the trend, it also showed a steady upward trend after the Spring Festival. After August, it decreased slightly and remained below the annual

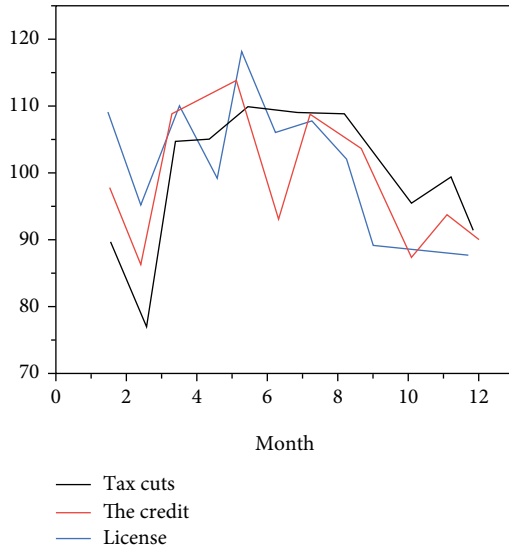


FIGURE 10: Trend chart of subindices of registered capital, access to resources, intellectual property rights, and bankruptcy handling

average, which is basically consistent with the trend of launching platforms. It shows that since August, the platform has not been optimistic about economic expectations, and the number of shutdowns and delays has increased.

### (3) Tax

Enterprises pay more attention to the policy content of tax reduction and fee reduction. Especially since August, the platform's perception of tax reduction and fee reduction has increased significantly, and it is higher than the national average, and the tax reduction search index has increased significantly.

### (4) Financing

While the perceived tax burden on the platform is reduced, the platform's financing difficulties are still relatively serious. Some Internet financial platforms such as "Hexindai" and "Renrendai" have become important channels for the platform to solve financing problems.

### (5) Registered capital

The trend of the "registered capital" index is relatively stable, reflecting that the platform has been less constrained in its establishment. There was a rise in November, mainly due to the implementation of the new "Company Law" at the end of October. The relevant regulations on the platform's registered capital were adjusted.

### (6) Intellectual property rights

This indicator shows a strong policy-driven effect. As the first year of "strong protection" of intellectual property rights, policy combinations have been implemented one after another, and the platform's awareness of intellectual

property protection has gradually increased [29]. In February, the state successively issued important documents such as the Measures for the Administration of Intellectual Property Certification and the Opinions on Several Issues Concerning Strengthening Reform and Innovation in the Field of Intellectual Property Judgment and revised the Patent Agency Regulations in November. Correspondingly, the search index at these two time points also showed a high point of concern.

### (7) Acquisition of resource

The search for "shops" reflects the willingness to establish and operate the platform. From the trend chart, it can be found that the index is generally consistent with the platform opening trend and shows a certain seasonal effect.

### (8) Bankruptcy

The platform has experienced a relatively difficult year, and many platforms have experienced a decline in efficiency and difficult operation. Some platforms were also forced to go out of business, including some with a certain scale. The subindex shows that since the beginning of 2018, the search index for bankruptcy has remained at a high level compared with the beginning of the year, which is consistent with the actual trend. This situation has also attracted the attention of the central high-level officials. By November, General Secretary Xi Jinping held a "Platform Symposium" to in-depth analyze the difficulties and problems encountered in the current platform economic development and clearly put forward relevant policies and measures.

*4.2.3. Main Conclusion.* Under the background of big data, online search data has the characteristics of easy access, objectivity, and timeliness. The massive netizen behavior data of Baidu Index is an important platform and information source for statistical analysis and big data mining. Based on Baidu Index, this paper establishes a relatively complete framework, steps, and methodology of big data mining. The construction of the index based on network search behavior is mainly based on the platform; especially, the business decision-making behavior of individual industrial and commercial households is mainly affected by the individual. Through the law of its search behavior, the correlation between the micro behavior and the overall trend of the platform is established. Through empirical analysis, it is concluded that the operation of the private economy in 2018 presents an "inverted U" trend. The rich information contained in the platform's economic status concern index can not only reflect the changes in the business environment perceived by the platform but also reflect the changes in the platform's market expectations, especially the expectations of the economic trend, which is of great significance for optimizing the investment attraction environment. The results show that since the second half of 2018, platforms have not been optimistic about the economic development situation, and their willingness to set up platforms in cities has decreased.

TABLE 4: The subindex and comprehensive index of platform economic conditions from January to December.

	Apply for a license	Get credit	Tax incentives	Registered capital	Get resources	Composite index
January	12.45	7.65	28.65	6.54	4.01	75.61
February	6.56	8.23	25.30	7.52	4.65	69.36
March	10.65	9.35	30.75	5.25	5.73	81.54
April	12.45	9.63	34.25	6.54	4.94	84.55
May	13.78	9.19	33.24	7.93	4.37	75.32
June	14.96	7.80	29.35	5.62	5.66	77.97
July	13.89	9.37	28.43	5.14	4.88	75.82
August	13.85	8.79	27.11	5.61	4.21	86.39
September	12.36	8.37	30.44	6.21	5.09	73.55
October	12.74	7.91	29.86	6.83	4.33	76.48
November	11.88	9.31	32.75	5.97	4.59	74.51
December	13.25	7.84	34.89	5.37	4.19	75.22



FIGURE 11: Trend chart of subindices of launching a platform, handling licensing, taxation, and financing.

### 5. Conclusion

(1) Strengthen the application of big data monitoring in the formulation of platform economic policies, design the application of big data in platform economic policy decision-making as a whole, and explore first in some areas that are most directly affected by big data and have relatively sufficient conditions for applying big data. It is suggested that the relevant departments of the platform economy should set up a special work, build a platform economy monitoring and forecasting system based on nonstatistical data, and integrate Internet-related data sources as soon as possible to assist in finding out the city’s “family” of the platform economy and scientifically research and judge the prominent problems in the operation of the platform economy. Thereby, it provides an important reference for government departments to formulate platform

economic development policies and promote work in a targeted manner

- (2) Promote the aggregation of data resources related to platform economic monitoring and forecasting. The platform economy development system is huge, and the relevant data are distributed in different government departments. It is recommended to sort out and gather data resources and channels related to the platform economy as soon as possible, establish a crossdepartment and multilevel data sharing and exchange mechanism, and speed up the introduction of big data open and sharing standards. A standard system should be formulated related to economic data collection, data opening, data transaction, and security. It is necessary to scientifically manage data resources and guide platforms to use such big data to develop new products and serve the development of the industry
- (3) Guide the big data platform to build an economic monitoring and forecasting development chain. Emerging industries are promising areas of development for the platform economy. It is recommended to vigorously excavate big data and establish a tracking and monitoring system for platform economic development around key areas and the development of emerging industries. Through government purchases, the platforms related to economic monitoring and forecasting are continuously improved, forming a whole chain of development from data collection, database establishment, data mining analysis, development, and application. Guide the big data application development platform to make full use of big data mining technology, enrich the big data macroeconomic forecasting method library and model library, develop monitoring and forecasting products, and realize real-time visual and dynamic display
- (4) Build an industry-university-research platform for platform big data monitoring and prediction. The development of platform economic monitoring and

forecasting based on big data needs to rely on a certain technical environment, including the support of big data collection and information exchange, core business big data comprehensive management and fusion analysis, visual analysis of Internet situation research and judgment, and big data intelligent push. It is recommended to increase capital investment in data analysis applications; adopt special funds, government purchases, and cooperation between government and social capital; and focus on supporting the infrastructure construction, platform construction, and product development of big data applications [30]. Cooperate with high-efficiency institutes to accelerate the technical research and business research of big data monitoring and prediction platform economy and service platform economy, and solve the problems of dimensional disaster, unstructured data, nonlinear relationship, and noise in big data analysis and application

## Data Availability

No data were used to support this study.

## Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

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