Scholar Publishing Group
International Journal of Multimedia Computing
https://doi.org/10.38007/IJMC.2023.040101
ISSN 2789-7168 Vol. 4, Issue 1: 1-19

Disclosure and Forecast of Stock Issuance Information Based on High Performance Computing and Blockchain Technology

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Keywords: Stock Issuance Information Disclosure, Stock Issuance Forecast, High-Performance Computing, Blockchain Technology

Abstract: The healthy operation of digital finance is inseparable from effective supervision. At present, the blockchain still has certain problems in digital financial supervision. Blockchain technology can improve the security and controllability of the blockchain system by controlling membership, but it cannot ensure that all parties will not conspire to tamper with the basic agreement and ultimately harm the interests of other participants. This article takes the impact of high-performance computing and blockchain technology on the information disclosure and prediction of stock issuance as the research object, and selects the stock and stock index data disclosed by the stock issuance information of 100 listed companies on the Google Finance platform as samples, including daily opening prices, highest price, lowest price, closing price, transaction volume and adjusted closing price, among which the adjusted closing price is used as the target variable. The stock price data and transaction volume data are taken as input feature parameters at the same time, and normalized, and a stock prediction model suitable for different situations is established: CNN network model based on the distributed mechanism of blockchain technology to predict the stock issuance. The research results show that only when the application cost of blockchain technology is controlled within a certain range, that is, when the BC is 36.01, can the losses caused by the many drawbacks of the traditional model be compensated, thereby promoting the active use of the technology in the securities market. As far as each node company in the securities market is concerned, blockchain technology has helped stock issuers to increase their income most significantly, so they can bear more technology application costs.

1. Introduction

Blockchain technology is widely accepted as a disruptive technology. Although it is still in its

infancy at this stage, in fact, the application of blockchain technology seems to have gradually moved from concept to practice. At the same time, all the information stored on the blockchain can be accessed by all participants in the network. Each subject in the securities market can easily verify each other's information, which will greatly improve the accuracy of decision-making by each subject in the securities market and better deal with market fluctuations.

Miller proposed that blockchain technology can realize the collaboration of enterprise information at each node, can significantly improve the accuracy of demand forecasting and inventory replenishment capabilities, and will effectively promote the development of the securities market [1]. Morck R pointed out that the stock issuance business stabilizes stock market volatility through reversal trading of high selling and low attracting, and exerts the function of market price discovery [2]. Scheinkman pointed out that the optimism of the amplification of financing transactions and the pessimism of the amplification of securities lending transactions promote market speculation and arbitrage, and improve the efficiency of issuance [3]. More and more researches have begun to involve the integration of blockchain and the securities market, but at present, in view of the problems caused by the traditional securities market information islands, there are many researches on contract coordination strategies, and no emerging technologies are used to deal with the disadvantages of the securities market. Regarding the collaboration of various entities in the securities market, Li J et al. built inter-organizational relationships based on the principle of transaction quality, focusing on the role of contracts in managing partnerships in different securities markets [4]. Regarding the surge in uncertainty in the securities market, Bris et al. introduced the opportunity to measure the performance of the securities market when the securities market was interrupted, and proposed the use of information exchange technology to control the bullwhip effect [5]. Boulton discussed the horizontal information coordination strategy of stock issuers in a competitive environment, and explained how the supplier's pricing decision affects the information coordination incentives of stock issuers [6].

At present, most of the attention of blockchain technology is focused on its ability to fundamentally change the financial service industry, while its application in securities market operations is relatively small. In terms of cost optimization and traceability, Ghysels E et al. analyzed the application of blockchain in reducing the cost of credible information generation and coordinating transactions in the securities market. Consumers, producers, and governments increasingly need information about the quality, characteristics, and source information [7]. From the perspective of behavioral finance, French K R explored that stock issuance will reduce the transaction of overconfident investors, thereby reducing market liquidity [8]. In terms of corporate decision-making on blockchain, Guo H et al. discussed how different companies in different industries make decisions about various incentives and barriers to the application of blockchain technology [9]. Salvador E summarized the survey data of respondents related to the Securities Market Management Association and provided aggregate statistics on the adoption of blockchain by various companies to help practitioners benchmark current practices [10]. Brandt MW comparative analysis previous research did not consider the impact of emerging technologies on stock issuance. It is important to know that emerging technologies often become the driving force of economic, social and commercial transformation, so it is important to consider blockchain technology for the healthy development of the securities market[11].

This article takes the impact of high-performance computing and blockchain technology on the information disclosure and prediction of stock issuance as the research object, and selects the stock and stock index data disclosed by 100 listed companies on the Google Finance platform as the sample, and the adjusted closing price as the target variable. The stock price data and transaction volume data are taken as input feature parameters at the same time, and normalized, and a CNN network model based on the distributed mechanism of blockchain technology is established to

predict the stock issuance.

2. Status Quo of the Securities Market and the Blockchain Research Model

2.1. Impact of Stock Issuance on Market Volatility

Information disclosure reduces the volatility of stock returns, stock prices less reflect the company's own information, and stock prices are more synchronized. Stock issuance realizes the price discovery function through short-selling transactions, which can reduce price fluctuations and maintain market stability. By examining the impact of stock issuance on the rate of return and volatility, it can be found that the net financing amount has a positive impact on the rate of return and volatility of the underlying stock [12]. Information disclosure limits market ROIF, thereby reducing the efficiency of stock market issuance. As one of the important financial innovations, stock issuance has created sufficient ROIF for the market by allowing information disclosure to realize credit transactions [13]. The 19 financial institutions that suspended short-selling transactions during the US subprime mortgage crisis in 2008 and 17 other companies that were not affected by the incident found that information disclosure made a difference in ROIF. The former's excess return rate was significantly higher than the latter, which was caused by information disclosure. The stock price is overvalued. Stock issuance can improve the efficiency of issuance by increasing stock ROIF [14]. Most studies have shown that excessive information disclosure weakens market ROIF, which is not conducive to the improvement of issuance efficiency [15]. A stock with a lower R^2 has a stronger correlation between current and future earnings, and more individual heterogeneous information is reflected in the stock price. Through a comparative study of global markets, it can be found that in the trading market that allows investors to obtain company information conveniently and at low cost, stocks often contain more heterogeneous information, and R^2 has declined. Under the condition of non-disclosure of information, the asymmetry of information reduces the willingness of uninformed investors to trade [16]. When there is information disclosure that makes the internal information of listed companies opaque, the stock price synchronization is stronger, that is, it contains less characteristic information, and the goodness of fit with the return of the market is higher [17]. In addition, from the perspective of corporate governance, blockchain technology can form an implicit supervision mechanism to force the management to improve the company's profitability and governance. During the global financial crisis of 2008-2009, stock issuance and trading played a very limited role in improving the efficiency of stock issuance. However, the effectiveness of the issuance efficiency of the target with a high turnover rate and large ROIF was more obvious, but its ability to reflect its own unique information. It is weaker and the stock price itself contains less information. The stock issuance business can promote the speed and degree of response of stock prices to new information, that is, the stock issuance business can significantly improve the issuance efficiency of listed companies [18].

2.2. Advantages of High-Performance Computing

With the continuous emergence of new computing platforms, including hardware and architecture, the computing power of high-performance computing systems has been rapidly increasing in terms of hardware [19]. However, in actual computing applications, many scientific computing applications cannot make full use of the potential computing capabilities of the system, resulting in a waste of computing resources. For general stock issuance systems, when developing these applications, the specific advantages of computing platform hardware and architecture are not fully considered and utilized [20]. For a specific application, it is necessary to analyze the program

to establish a behavioral model of the program, so that the performance bottleneck and optimization potential of the program can be obtained, and then the optimization plan of the program on the computing platform is proposed. By analyzing the program at the granularity of functions or loops, and studying the instruction sets that make up these structures, it can provide relevant behavioral characteristics of CPU processing and memory access, which can be applied to program performance optimization [21]. In the development and use of high-performance computing software, performance issues have always been the most important concern. Software designers and users need to have a thorough understanding of the software itself and the platform environment on which the software runs, in order to design corresponding solutions in a targeted manner to improve the running performance of the software. In order to improve the performance of the software, it is necessary to establish a performance model of the software, to study the problems that may affect the performance, and to discover potential performance optimization opportunities [22].

Current program performance analysis tools can be divided into two types: static and dynamic. The dynamic method is mainly to execute the application under test, and obtain and analyze the performance data of interest at runtime, such as the running time, the value of the hardware performance counter, etc. [23]. TAU is a tool that can dynamically measure the performance of parallel software. This tool mainly uses instrumentation and sampling methods to obtain the running time of different code blocks at runtime, so as to establish the performance model of the system, and predict the system on different operating platforms on this basis the performance on the Internet provides help for performance optimization. The apollo tool provides a series of APIs that can be used to dynamically analyze the program [24]. It provides a lightweight method based on machine learning to select the best parameters for performance tuning. It reduces the cost of modeling by distributing the cost of modeling to multiple runs, instead of building a model through one run [25]. The SST tool establishes a performance model through system simulation. It simulates the entire system, analyzes the interaction between the architecture, programming model, and communication system, rather than just considering the application. Due to the high computational cost of simulation, this method is heavyweight, focusing on hardware, and more complex, which limits the scale and complexity of the simulated application. The biggest shortcoming of dynamic performance data collection is that it is expensive, and the program needs to be run multiple times, which consumes longer running time and computing resources.

2.3. Information Security and Blockchain Technology for Stock Issuance Information Disclosure

With the emergence of new technologies, the security boundaries of stock finance are constantly changing, and information security problems are becoming increasingly serious. At present, in the development of my country's stock finance, there are information security issues such as customer information collection, storage, and use, which often poses greater security risks to investors. First of all, there may be illegal and illegal acquisition of data information that is not directly related to the stock financial business in the stock financial information collection, causing unnecessary losses to customers. For example, on the online loan platform, a large amount of funds flow through the platform, which has strict requirements for security. The decentralized nature of the blockchain can enhance the security of the development of stock finance. In traditional financial transactions, due to the lack of a good credit environment, both parties to the transaction may cheat each other. This requires the use of a highly trusted and uninterested third party as an intermediary to witness, supervise and maintain the normal operation of the system. Since the third party has mastered a large amount of customer resource information in the transaction, the intermediary that assists in closing the transaction has gradually become the center of credit granting. All transactions are

screened and matched by a third party. The third party has changed from a witness of the initial transaction activity to a supervisor, maintainer and decision maker of the transaction activity. Its status is higher than that of many participants in trading activities and has become the actual center of trading activities. But the real participants in trading activities can only become the follower of the rules set by the third party and passively accept these rules. In order to maximize its own interests, the credit granting center often conflicts with the needs of its service users. The blockchain is a peer-to-peer distributed accounting system. Any two nodes in the system can directly conduct transactions without going through a third party, thus achieving decentralization.

The blockchain assigns witness rights, supervision rights, and decision-making rights equally to each node in the system that actually participates in value exchange activities, and the data records involved in the system are jointly generated and maintained by these nodes. The operating mechanism of the blockchain subverts the previous centralized method of credit enhancement through third parties. By constructing a cross-border non-stakeholder network verification mechanism, it uses scientific and technological recording methods to ensure the authenticity of information, thereby creating an environment of equality and mutual trust for stock financial transactions. It further reduces the risk of information asymmetry in the development of stock finance, provides reliable guarantee for point-to-point financial communication, and greatly enhances the security of stock financial transactions. In the process of using the blockchain in stock finance, the consensus mechanism is used to ensure that the data on the chain is reliable, safe, transparent and non-tamperable. At the same time, the anonymity of the blockchain can effectively protect the rights of nodes on the chain and the privacy of users. Use the cryptography technology in the blockchain to accurately quantify the value of data information, effectively control data permissions, and ensure user data privacy and rights. It does not require a trusted central authority, so as to provide users with digital identities that protect privacy in transaction scenarios, and achieve safe and reliable operation of stock finance.

Blockchain helps reduce the harm of stock financial risks. At present, the barbaric growth of my country's stock financial industry is serious, especially the disorderly expansion of online lending, which is likely to cause systemic risks in the financial market. Stock finance has changed the carrier and technology of financial transactions, but it has not changed the risk attributes of the financial industry. Stock financial risks occur from time to time. When stock finance relies on the development of emerging technologies such as cloud computing, biometrics, big data, and Internet payment, many new risks will also arise. When using cloud computing, due to the possibility of biometrics being stolen (such as fingerprint information may be stolen, etc.), thereby increasing the financial risk of stocks. Similarly, the security of stock financial technology has aggravated the financial risks of stock financial users.

2.4. Blockchain Technology and High-Performance Computing Model

Traditional securities market data collection adopts a centralized operation model, and the content of shared information is limited and there are hidden dangers such as information tampering. The inability to achieve intelligent connection between the various links of the securities market has caused serious information lag and hindered sellers from accurately predicting customer needs. This article uses high-performance computing and blockchain technology for stock issuance, information disclosure, etc. The fluctuation value of stock issuance under this condition:

$$E = E_w + E_{nb} + E_t - \mathrm{Ic} \tag{1}$$

$$E = \frac{\sum_{j=1}^{k}\sum_{h=1}^{k}\sum_{t=1}^{n_j}\sum_{r=1}^{n_h}\left|y_{ij}-y_{hr}\right|}{2n^2u} \tag{2}$$

In addition, the additional transaction costs and transaction costs of stock issuers due to the lack of data and information coordination are unavoidable, that is, E=1. Thus, the profit function of the stock issuer is:

$$u_h \le u_j \le ... \le u_k \tag{3}$$

$$\mathrm{E_j} = \frac{\frac{1}{2u_j}\sum_{i=1}^{n_j}\sum_{r=1}^{n_j}\left|y_{ji}-y_{jr}\right|}{n_j^2} \tag{4}$$

$$Ew = \sum_{j=1}^{k} G_{jj} p_j s_j \tag{5}$$

Among them, E means not to use blockchain technology. Under the traditional model that does not use blockchain technology, the optimal selling price of the stock issuer, the optimal order quantity and retail price of the seller, and the optimal transaction service level and transaction quotation of third-party trading companies can be obtained, and accordingly obtain the optimal profit of stock issuers, sellers and third-party trading companies E and R and the total profit of the overall securities market:

$$\mathrm{E}_{jh} = \frac{\sum_{Z=1}^{h_j}\sum_{r=1}^{n_h}\left|y_{ji}-y_{hr}\right|}{n_j n_h (u_j+u_h)} \tag{6}$$

$$E_{nb} = \sum_{j=2}^{k}\sum_{h=1}^{j-1} G_{jh}(p_j s_h + p_h s_j) D_{jh} \tag{7}$$

$$\mathrm{E}_t = \sum_{j=2}^{k}\sum_{h=1}^{j-1} G_{jh}(p_j s_h + p_h s_j) D_{jh}(1-D_{jh}) \tag{8}$$

By relying on the blockchain-based securities market data exchange platform, the quantity and quality of information exchanged by all parties in the securities market can be enhanced and improved to improve the accuracy of sales and operation plans. The features of blockchain decentralization, tamper resistance, and traceability can effectively compensate for the hidden dangers of data information tampering caused by the excessive centralization of the traditional securities market, ensure the authenticity of data information, and further improve the accuracy of predictions, that is, actual fluctuation value of order quantity:

$$D_{jh} = \frac{d_{jh}-P_{jh}}{d_{jh}+P_{jh}} \tag{9}$$

Assuming that the total cost of adopting the blockchain is BC, the cost saved by each node enterprise in the securities market in a single search for a partner is:

$$d_{jh} = \int_0^{\infty} dF_j(y) \int_0^{y} (y-x) dF_h(x) \tag{10}$$

$$d_{jh} = \int_0^{\infty} dF_h(y) \int_0^{y} (y-x) dF_j(y) \tag{11}$$

For stock issuers, it is possible to adjust production in time, because stock issuers can obtain

more downstream information from sellers, and inventory risks can be effectively avoided through information coordination, namely:

$$f(x)=\frac{1}{Nh}\sum_{i=1}^{N}k(\frac{X_i-x}{h}) \tag{12}$$

$$k(x)=\frac{1}{\sqrt{2\pi}}\exp(-\frac{x^2}{2}) \tag{13}$$

In this paper, the profit of the two parts is maximized, and the corresponding optimal solution of the circulation is obtained

$$h_t=\tanh(w_c x_t+u_c(r_t\Theta h_{t-1})+b_c) \tag{14}$$

$$h_t=z_t\Theta h_{t-1}+(1-z_t)\Theta h_t \tag{15}$$

h_t indicates the use of blockchain technology. In this way, the profit function of stock issuers is as follows:

$$P=\sigma t=\frac{\sqrt{\frac{1}{n}\sum_{i=1}^{n}(FI_{it}-FI_{it})^2}}{FI_{it}} \tag{16}$$

$$u_{(j|i)}=w_{ij}A_i \tag{17}$$

$$s_j=\sum_i c_{ij}u_{(j|i)} \tag{18}$$

For which a given probability value P, P is a random number between 0 and 1 P compared with Prob generate probability, are:

$$\ln(\frac{PI_{it}}{PI_{it}-1})=\alpha+\beta\ln PI_{it}-1+v_i+\Im_t \tag{19}$$

For vendors, sellers communication data can make more accurately grasp the demand of the market information, accurate replenishment, avoided in response to the market

$$r=\frac{\alpha}{1-\beta} \tag{20}$$

$$\theta=-\frac{1}{T}\ln(1+\beta) \tag{21}$$

For the third-party issuing enterprises, the transportation business can optimize the asset storage and responsibility arrangement by sharing the shipping plan information in the early stage, so as to reduce the transportation cost. Therefore, the profit functions of E and R are as follows:

$$\ln(\frac{FI_{it}}{FI_{it}-1})=\alpha+\beta\ln FI_{it}-1+\varphi X_{it}-1+v_i+\tau_t \tag{22}$$

$$k_{t1}[i]=\sum_j\cos(w_i^1,w_j^2) \tag{23}$$

Considering that the profit of the seller is composed of two parts, they are the profits brought by

the circulation of the third-party issuing enterprises. Where FI is the external influencing factor variable matrix, which is the corresponding coefficient matrix. If it is significantly less than 0, the numerical simulation of stock issuance information disclosure tends to converge, that is, there exists conditional convergence.

3. Information Disclosure and Prediction of Stock Issuance

3.1. Securities Sample and Technical Support

In this paper, the impact of high-performance computing and blockchain technology on the information disclosure and prediction of stock issuance is studied. The data of stock and stock index disclosed by 100 listed companies in finance platform are samples, including daily opening price, highest price, lowest price, closing price, trading volume and adjusted closing price, in which the adjusted closing price is taken as the target variable. The stock price data and trading volume data are taken as the input characteristic parameters and normalized.

3.2. Contents and Steps

(1) Model design

A CNN network model based on the diversification mechanism of blockchain technology is established to predict the stock issuance. In view of the fact that the issuing efficiency of the subject matter of the stock issue is generally higher than that of the object not participating in the stock issue, and it also has higher requirements on the scale of market value and profitability, so the use of panel data is conducive to solving the endogenous problem caused by missing variables. The model is as follows:

$$\text{Efficiency}_{i,t} = \alpha_0 + \beta * \text{Policy}_{i,t} + \theta * \text{Controls}_{i,t} + u_i + \varepsilon_{i,t} \quad (24)$$

Among them, efficiencynyi represents the issuance efficiency of the i-th stock issue target in the T period. PolicyI is a policy dummy variable. Its value before and after being selected is 0 and 1 respectively. Controlsi represents a series of control variables. Previous studies have shown that turnover rate, amplitude, earnings per share and other financial and valuation indicators can also affect the issuance efficiency. u_i is the individual effect of the underlying stock, ε_i, t is a random error term. The regression coefficient of the explanatory variable PolicyI reflects the impact of the implementation of stock issuance policy on the efficiency of stock issuance of listed companies.

(2) Metrics

This paper measures the stock issuance efficiency from two dimensions: the first is the stock price synchronicity, that is, the reaction speed of the stock price of listed companies to the new market information is taken as the index of issuing efficiency, which reflects whether the new information can be reflected in the stock price in time. The second is the absolute value of the correlation coefficient between the return of individual stock and the return of the lagging one period market, that is, the reflection degree of stock price to new news. The index describes how much new information is digested by the stock price and whether the new information is sufficiently reflected. The auxiliary regression equation was as follows

$$r_{i,t} = \alpha + \beta * r_{m,t} + \varepsilon_{i,t} \quad (25)$$

The goodness of fit is transformed into logarithm to obtain the efficiency of stock synchronicy1i

$$\text{Efficiency}\,1_{i,t} = \ln\left(\frac{R_{i,t}^2}{1-R_{i,t}^2}\right) \tag{26}$$

The stock forecast in practical application is often more complex than this situation, so it is necessary to establish a stock forecasting model which is suitable for different situations. In order to solve this problem, this paper uses polyhedron model to model the stock forecast. Polyhedral model is an intuitive algebraic representation. It regards each iteration of stock forecasting as a lattice point in polyhedron space, which can be used to describe the characteristics of iteration space in specific types of stock forecasting. The polyhedron space is generated by stock forecast boundary and termination condition. Nested stock forecasts can be transformed into a polyhedron representation if and only if they have affine boundary and termination conditions, and the polyhedron space generated by them is a convex set. Whether the polyhedral model can be used to generate general representation depends on the stock prediction parameters which describe the iteration space of stock forecasting. Besides program transformation, polyhedron model is widely used in automatic optimization and parallelization in compiler (gloog) and other tools. Polyhedral model can deal with an n-level nested stock forecast, and the iteration space of stock prediction is represented by an n-dimensional polyhedron space.

(3) Evaluation index

In order to evaluate the prediction performance of ceemdan-agu model for stock price, this paper uses three regression evaluation indexes: root mean square error (RMSE), mean absolute error (MAE) and R-square (R^2). RMSE and Mae are used to measure the deviation between the real value and the predicted value. The smaller the value is, the closer the predicted value is to the true value. R^2 is used to measure the degree of model fitting. The closer to 1, the better the model fitting is. The EMD and ceemdan of stock time series decompose the original stock price series into several IMF series and a residual series by EMD and ceemdan algorithm. Generally, the number of IMF generated is usually less than that of EMD algorithm. In order to compare the decomposition effect of the two algorithms more intuitively, the experiment limits that the number of IMF generated by EMD is the same as ceemdan.

4. Stock Issuance Information Disclosure and Prediction

4.1. Double Differential Regression Analysis of Information Disclosure

As shown in Figure 1, due to the strong endogenous selectivity of the expansion target, that is, the issuance efficiency itself is better, the target is more likely to be selected as the object of stock issuance expansion. Before the implementation of the policy, there are many differences in the average issuance efficiency between the control group and the experimental group. However, with the increase of the number of stock issuance expansion, the distribution of the issuing efficiency of the selected targets increases, so the grouping randomness is also strengthened.

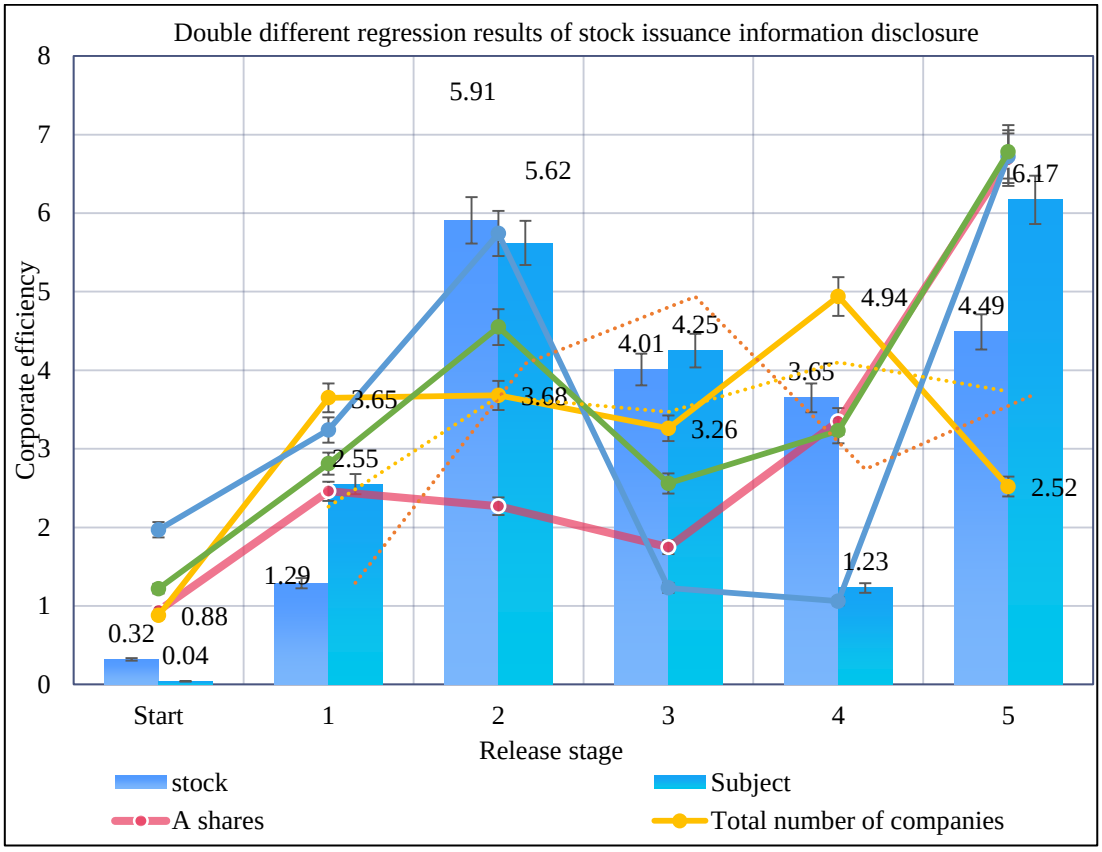

Figure 1. Double difference regression results of stock issuance information disclosure

Table 1. Regression coefficients obtained by two estimation methods

Num	Stock	Subject	A Shares	Total number	Percentage	Multiply
Start	0.32	0.04	0.94	0.88	1.97	1.22
1	1.29	2.55	2.46	3.65	3.24	2.81
2	5.91	5.62	2.27	3.68	5.74	4.55
3	4.01	4.25	1.75	3.26	1.23	2.56
4	3.65	1.23	3.35	4.94	1.06	3.23
5	4.49	6.17	6.68	2.52	6.72	6.78

As shown in Table 1, the regression coefficients obtained by the two estimation methods are consistent, while the coefficient variance obtained by the boot strapped robust standard error estimation is slightly larger than that of the ordinary standard error. The interaction coefficient reflecting the policy effect is significantly negative at the level of 0.1 and 0.01 under the two issuance efficiency indicators, which verifies the conclusion that the implementation of the stock issuance policy does improve the issuance efficiency. The experimental step is to randomly select 650 samples from the population including the fifth and Sixth Expansion targets for double differential regression, and cycle for 500 times, and draw the nuclear density distribution map according to this, and compare with the real policy effect value. The results show that the double difference review has strong robustness.

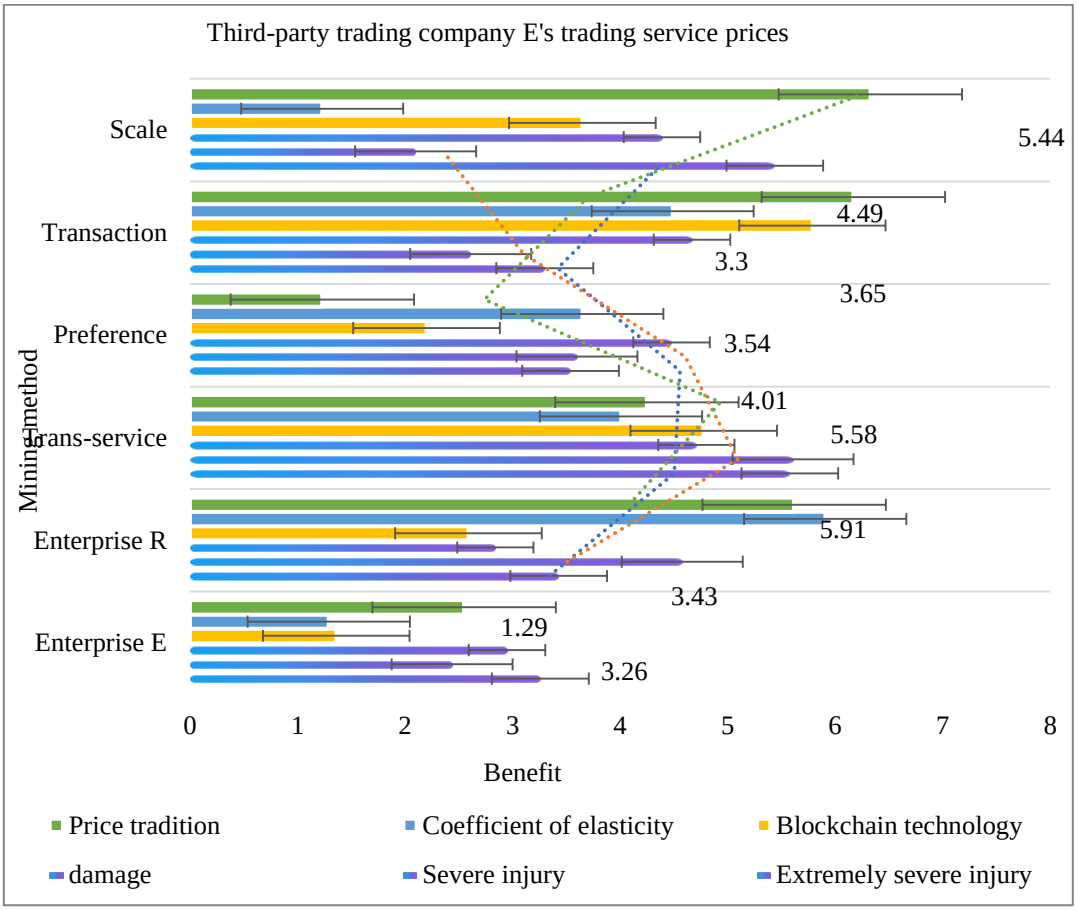

Figure 2. Third-party trading company E's trading service prices

As shown in Figure 2, with and without blockchain technology, the transaction service price of third-party trading enterprise E decreases with the increase of preference index and transaction cost elasticity coefficient, while the service price of third-party trading enterprise R increases with the increase of preference index and decreases with the increase of transaction cost elasticity coefficient. Under the application of blockchain technology, the impact of preference index and transaction cost elasticity coefficient on transaction service price is higher than that of traditional mode.

Table 2. Influence of preference index and transaction cost coefficient

Item	Extremely Severe Injury	Severe Injury	Damage	Blockchain Technology	Coefficient of Elasticity	Price Tradition
Enterprise E	3.26	2.44	2.95	1.36	1.29	2.55
Enterprise R	3.43	4.58	2.84	2.59	5.91	5.62
Trans-service	5.58	5.61	4.71	4.78	4.01	4.25
Preference	3.54	3.6	4.48	2.2	3.65	1.23
Transaction	3.3	2.61	4.67	5.79	4.49	6.17
Scale	5.44	2.1	4.39	3.65	1.23	6.33

As shown in Table 2, with and without blockchain technology, the order quantity of two third-party trading enterprises is affected by preference index and transaction cost coefficient. Compared with the traditional mode, the order quantity under the application of blockchain technology is higher than that under the traditional mode. Blockchain has changed the mode of

information ownership, transferring the ownership of information from the state owned by a single owner to the account information shared by all participants in the whole transaction cycle.

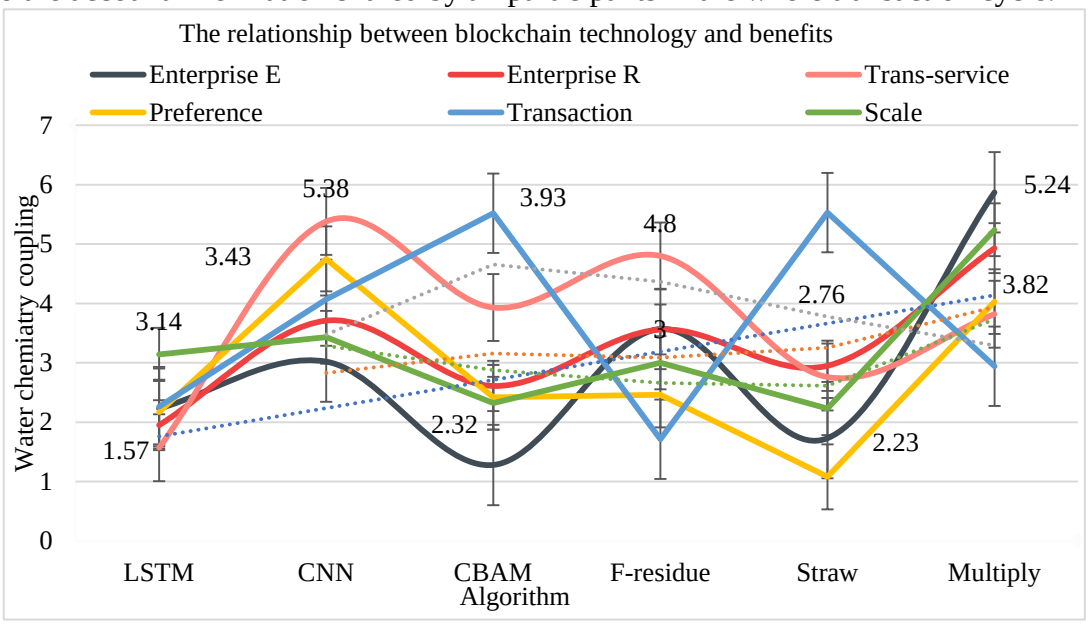

Figure 3. The relationship between blockchain technology and benefits

As shown in Figure 3, each node enterprise in the securities market can avoid wrong decision making, make more accurate prediction, and make up for the loss caused by considering risks. The results show that the application of blockchain technology may not make the profit of each node enterprise and the overall profit increase significantly. When the application cost of blockchain technology is too high, the profit generated by the technology itself is not enough to support the cost of technology investment, and each node enterprise in the securities market will choose to give up using the technology. Therefore, it is necessary to control the application cost of blockchain technology in a reasonable range, so as to encourage enterprises to actively explore the determination of blockchain technology application.

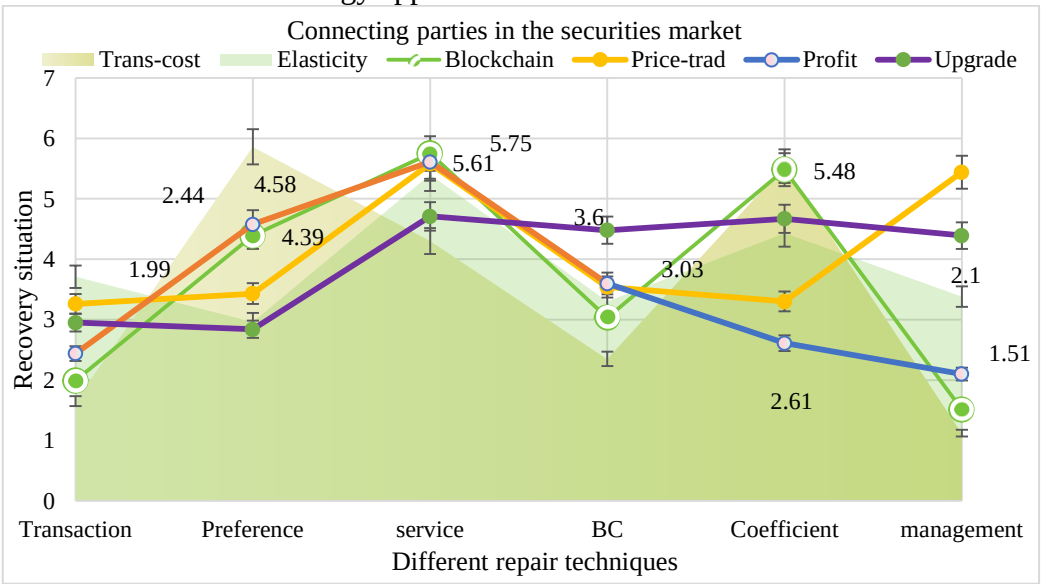

Figure 4. Connecting parties in the securities market

As shown in Figure 4, the use of blockchain technology can help all parties in the securities market to establish contact, which helps to improve the communication between all parties in the securities market. Enterprises can predict market demand more accurately, and the inventory management team can actively respond to market changes and carry out inventory control. But at the same time, we should also consider the application cost of blockchain technology. Therefore, by adjusting the application cost BC of blockchain technology, we can make BC analyze its impact on the profit and total profit of each node enterprise in the securities market.

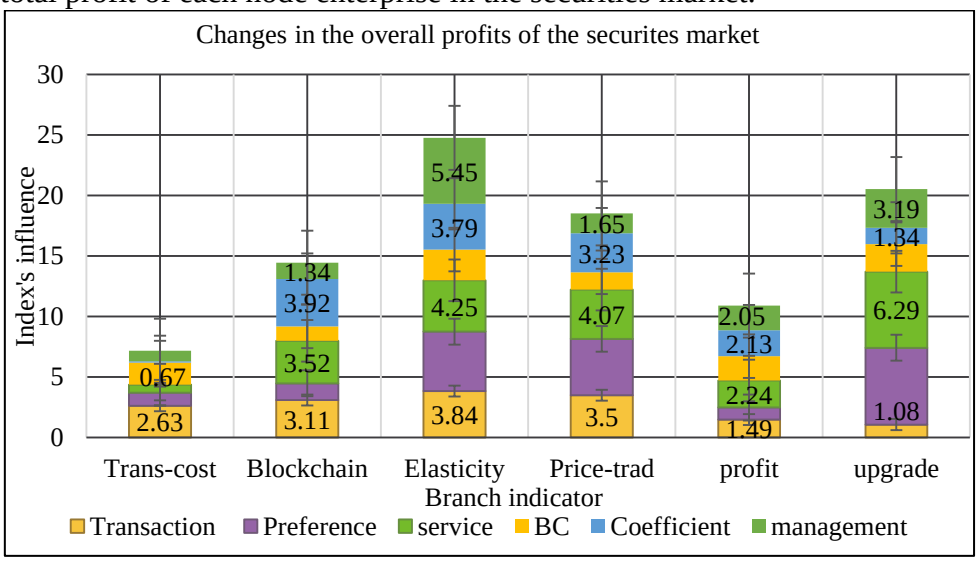

Figure 5. Changes in the overall profits of the securities market

As shown in Figure 5, in terms of the overall profit of the securities market, compared with the changes in the overall profit of the securities market before and after the application of blockchain technology, it can be seen that the increase in the application cost of blockchain will lead to the decrease. Therefore, only when the application cost of blockchain technology is controlled within a certain range, that is, the BC is 36.01, can we make up for the losses caused by many disadvantages under the traditional mode, so as to promote the securities market to actively use the technology.

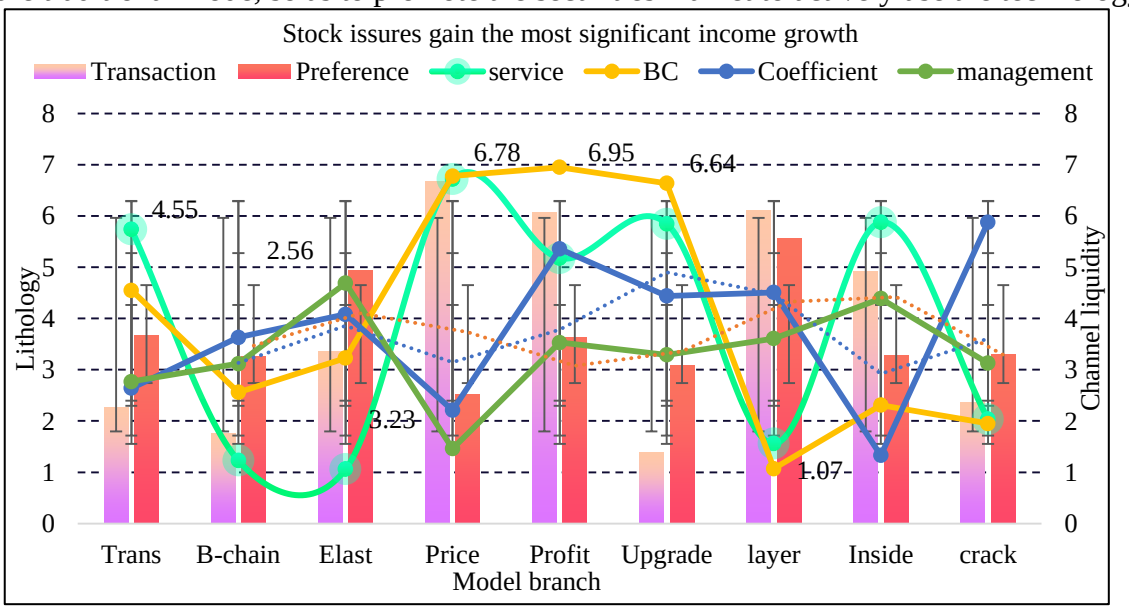

Figure 6. Stock issuers gain the most significant income growth

As shown in Figure 6, for each node enterprise in the securities market, the blockchain technology helps stock issuers to increase their income most significantly, so they can bear more technology application costs. The third-party trading enterprise R can bear the lowest cost of technology application. In order to keep all node enterprises benefit from the benefits brought by the application of blockchain technology, it is necessary to further control the technology application cost. By comparing with the third-party trading enterprise R under the traditional securities market mode mentioned above, it needs to meet the BC > 18.64 yuan, so as to encourage all node enterprises to actively explore the blockchain technology Use the foreground.

Table 3. Losses caused by many drawbacks in the traditional model

Item	Transaction	Preference	service	BC	Coefficient	management
Trans-cost	2.63	1.08	0.67	1.81	0.13	0.85
Blockchain	3.11	1.38	3.52	1.18	3.92	1.34
Elasticity	3.84	4.92	4.25	2.52	3.79	5.45
Price-trad	3.5	4.66	4.07	1.42	3.23	1.65
Profit	1.49	1	2.24	2	2.13	2.05
Upgrade	1.08	6.35	6.29	2.28	1.34	3.19

The regression coefficient is shown in Table 3. In the short term of the implementation of the stock issuance, the holders of the subject matter with higher earnings per share have an increased tendency to gain more profits by increasing leverage, and the phenomenon of helping the price rise and killing the decline is more prominent. The improvement of the issuance efficiency is not obvious, and even reduces the issuance efficiency. In addition, for the subject with larger amplitude, the response speed to new information is faster, which may be due to the weakening of investors' common expectation after the implementation of stock issuance, and the risk of stock heterogeneity is reflected in the greater volatility, and the return to rational value is faster.

4.2. Implicit Information Disclosure and Numerical Simulation

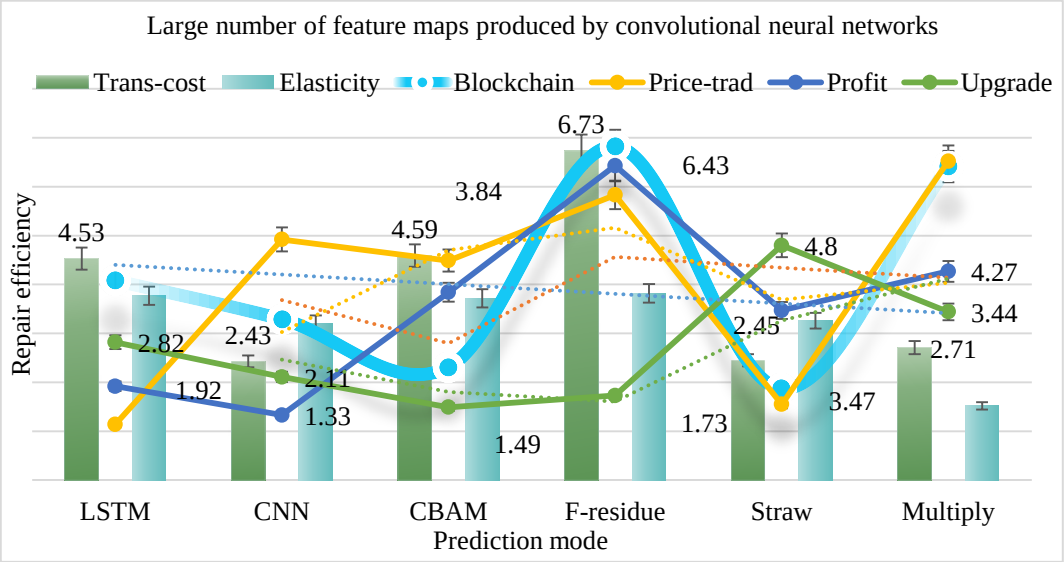

Figure 7. Large number of feature maps produced by convolutional neural networks

As shown in Figure 7, although the LSTM model can fit the general fluctuation of stock price, the fitting accuracy is low, and the prediction effect of CBAM is obviously better than that of

LSTM network model and lstm-cnn network model, because CBAM module can select feature graphs which have important influence on prediction results from a large number of feature maps generated by convolutional neural network through channel attention mechanism. At the same time, the effective feature information can be selected from the spatial information of the feature map through the spatial attention mechanism. The model can predict the stock price reasonably and *accurately*.

Table 4. The difference between the predicted value of the stock price and the actual value

Item	Trans-cost	Blockchain	Elasticity	Price-trad	Profit	Upgrade
LSTM	4.53	4.08	3.77	1.14	1.92	2.82
CNN	2.43	3.29	3.21	4.92	1.33	2.11
CBAM	4.59	2.31	3.72	4.49	3.84	1.49
F-residue	6.73	6.82	3.82	5.83	6.43	1.73
Straw	2.45	1.87	3.26	1.55	3.47	4.8
Multiply	2.71	6.41	1.52	6.52	4.27	3.44

As shown in Table 4, there is a big difference between the predicted value and the actual value of the stock price of the model, which may be caused by the influence of the government policy or network public opinion on the stock market at that time, rather than the defects of the network proposed in this paper. Therefore, this experiment verifies the effectiveness and feasibility of the proposed network. For example, in recent years, the phenomenon of malicious debt evasion, cash arbitrage and breach of contract frequently occurs in online lending, which makes a large number of online lending companies (platforms) go bankrupt, which brings great risks to the development of stock finance.

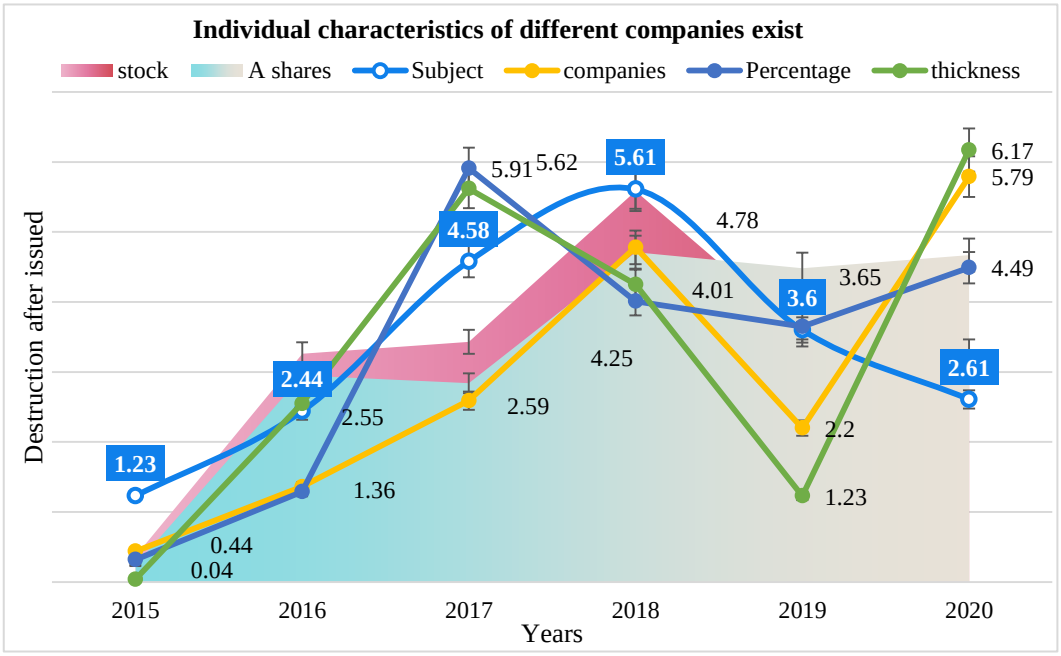

Figure 8. Individual characteristics of different companies exist

As shown in Figure 8, in recent years, the implementation of margin trading has a positive effect on the improvement of pricing efficiency of listed companies, but the absolute value of coefficient is small, so the effect of margin trading on the improvement of pricing efficiency needs to be strengthened. Considering that the individual characteristics of different companies are quite

different, if the mixed regression model is used, there will be missing variables that almost do not change with time. Before the formal regression, we need to do the following qualitative analysis and quantitative test on the selection of the model. When considering the fixed effect model, the intra group estimation method is used to capture the intra group autocorrelation characteristics, considering the strong correlation of the same company's issuing efficiency at different times.

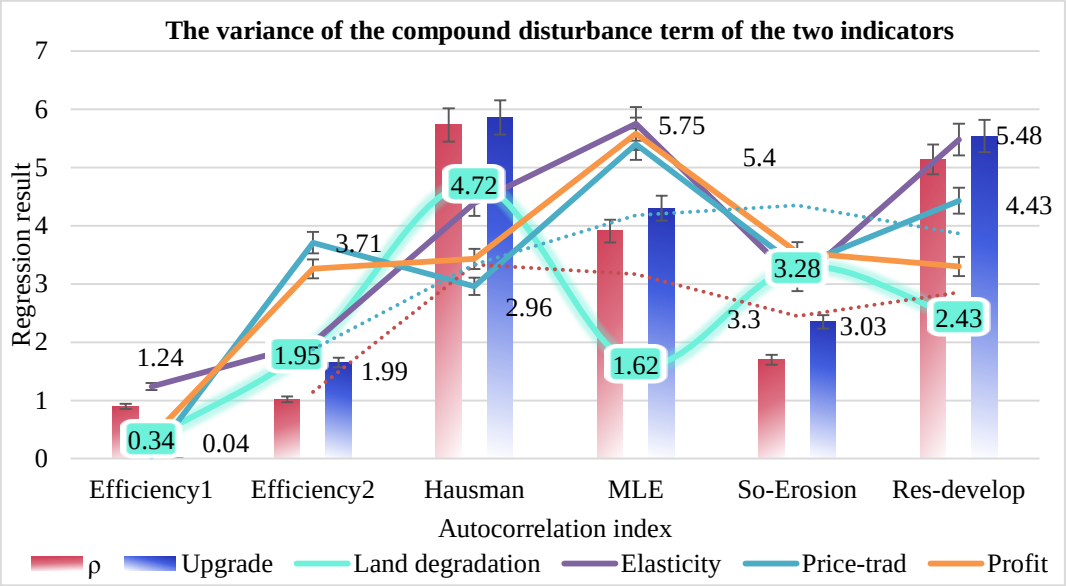

Figure 9. The variance of the compound disturbance term of the two indicators

As shown in Figure 9, the autocorrelation coefficients ρ of efficiency1 and efficiency2 are 0.2562 and 0.1029 respectively, which indicates that 25.62% and 10.29% of the variance of the composite disturbance term of the two indicators come from the change of individual effects. Further considering whether to use the individual fixed effect model, this paper introduces the individual dummy variable of each company to test the LSDV estimation method. The results show that the P values are 0 and 0.4039, which indicates that the individual fixed effect model should be used for the first index of issuance efficiency, and the individual effect is not as strong as the former for the second index, so the original hypothesis of mixed regression cannot be rejected for the time being. The MLE estimation of random effect model and Hausman test are used to determine whether the individual fixed effect model should also be used.

Table 5.There are differences between the two issuance efficiency indicator units

Item	ρ	Land degradation	Upgrade	Elasticity	Price-trad	Profit
Efficiency1	0.9	0.34	0.01	1.24	0.04	0.37
Efficiency2	1.02	1.95	1.65	1.99	3.71	3.26
Hausman	5.73	4.72	5.86	4.39	2.96	3.43
MLE	3.91	1.62	4.3	5.75	5.4	5.58
So-Erosion	1.7	3.28	2.35	3.03	3.3	3.54
Res-develop	5.14	2.43	5.54	5.48	4.43	3.3

As shown in Table 5, there are differences between the two issuance efficiency indicators. Among them, the variance of efficiency1 is higher than that of efficiency2. This is because there are still some hidden information disclosure in China's blockchain technology. The specific performance is that the proportion of individual investors participating in the two financing transactions is smaller than that of institutional investors, and institutional investors are more

inclined to issue some underlying stocks, so the impact on the issuance efficiency of these targets is faster than that on the contrary, it is not the influence of the strong target's issuing efficiency is slow. However, eficiency2, which measures the correlation coefficient between stock price and market return, has a greater difference with the underlying market, and is less affected by institutional investors' propensity. From the perspective of control variables, we can see that the Sixth Expansion of the sample covers a wide range of large, medium and small listed companies, at the same time, the operating conditions of each company are different, which is conducive to the promotion of the conclusion.

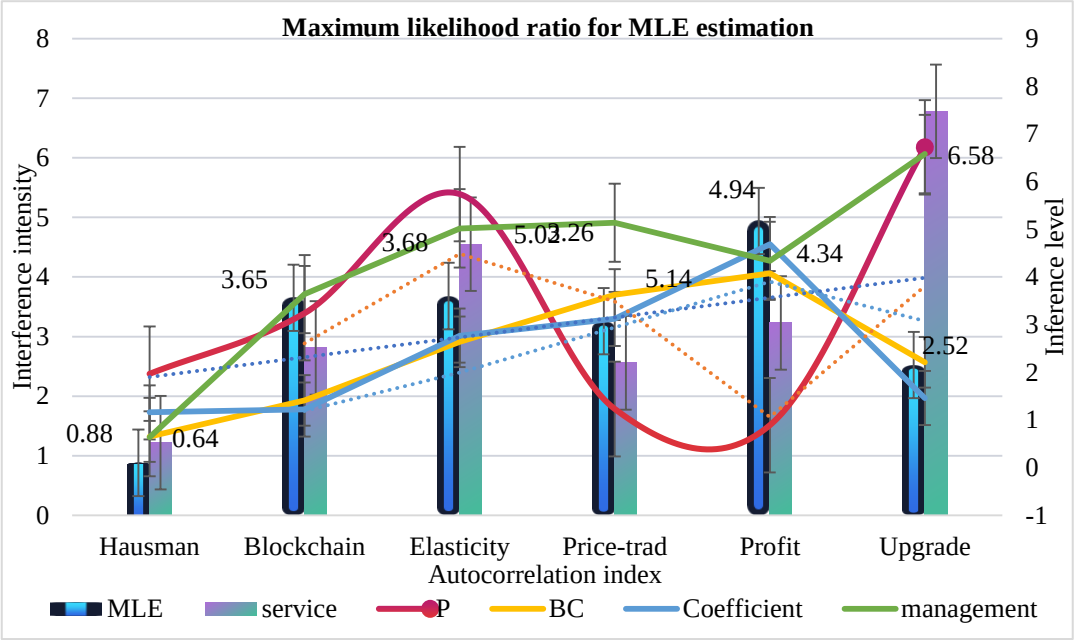

Figure 10. Maximum likelihood ratio test for MLE estimation

As shown in Figure 10, the MLE estimation of the random effect model is considered by the maximum likelihood ratio test to see whether the standard deviation of the individual effect is 0, and the P values are 0 and 0.89 respectively. Therefore, the original hypothesis of mixed regression can be rejected again for the first index of issuance efficiency, but the second index cannot be rejected, and the Hausman test is needed in the last step. The results show that the P values are 0 and 0.3 respectively, which indicates that the individual fixed effect model should be used strongly for the first index of issuance efficiency, and the individual fixed effect model should also be used for the second index at the significance level of 0.05.

5. Conclusion

At present, blockchain technology has not been implemented on a large scale and in a large scale. For traditional financial institutions such as banks, their technical capabilities may not meet the basic technical requirements required by the development of blockchain finance. For the securities industry, blockchain seems to have achieved decentralization in the settlement process of the securities industry, but it still needs the help of intermediary enterprises. For the insurance industry, each customer's information data needs to be recorded, saved and copied. The more node participants in the blockchain, the greater the pressure on the network and node computing. Massive data may bring data transmission errors, network paralysis and other hidden dangers, which will further increase the cost of insurance companies. Moreover, the distributed nature of blockchain

makes insurance claims need to spend more time, which greatly reduces the operational efficiency of the insurance industry.

Blockchain technology is the basis of digital currency, which is generally divided into private digital currency and legal digital currency. Because the law does not endow the private digital currency with exclusive and mandatory functions, and it has no national capital as the credit basis, it does not have the essential attribute of currency. However, because it is accepted by the general public in a specific scope, it poses a serious challenge to the national legal currency system. For example, Facebook's private cryptocurrency libra, which has relatively stable real purchasing power, anchors multi-national fiat currencies and is linked to multi-national currency baskets or government bonds, which greatly reduces the ability of some sovereign countries to regulate currency and capital. Especially for the countries whose capital account has not been fully convertible, it is easy to cause a large number of fiat currencies to be sold off, which will have an immeasurable impact on financial regulation, world monetary pattern and even the international political and economic system. In a word, digital currency based on blockchain technology may fundamentally change the nature of financial transactions and have strong decentralization characteristics. It may weaken the function of national financial center and seriously impact the independence of national monetary policy.

The application of blockchain technology may not make the profit of each node enterprise and the overall profit increase significantly. When the application cost of blockchain technology is too high, the profit generated by the technology itself is not enough to support the cost of technology investment, and the node enterprises in the securities market will choose to give up using the technology. Therefore, it is necessary to control the application cost of blockchain technology in a reasonable range, so as to encourage enterprises to actively explore the determination of blockchain technology application.

Funding

This article is not supported by any foundation.

Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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