

Retraction

Retracted: Evaluation of the Fluctuation Mechanism of Behavioral Financial Market Based on Edge Computing

International Transactions on Electrical Energy Systems

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This article has been retracted by Hindawi, as publisher, following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of systematic manipulation of the publication and peer-review process. We cannot, therefore, vouch for the reliability or integrity of this article.

Please note that this notice is intended solely to alert readers that the peer-review process of this article has been compromised.

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

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

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

References

- [1] X. Yuan, "Evaluation of the Fluctuation Mechanism of Behavioral Financial Market Based on Edge Computing," *International Transactions on Electrical Energy Systems*, vol. 2022, Article ID 2751197, 8 pages, 2022.

Research Article

Evaluation of the Fluctuation Mechanism of Behavioral Financial Market Based on Edge Computing

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The global economy is growing faster and faster. Behavioral finance is a transformation of financial theory. Over the past decade, this shift has had strong repercussions in academia, challenging the dominance of traditional finance and forming its own theoretical system. With the development of the stock market, traditional financial theories and behavioral financial theories continue to converge, and traditional financial theories based on investor rationality and efficient market assumptions are subject to unprecedented conjectures. Financial markets are affected by subjective factors such as people's behaviors and emotions. Investors always make decisions based on bounded rationality, cognitive deficits, and, ultimately, rationality. In order to avoid the complex and unpredictable risks of financial markets and understand their changing laws, the analysis of the characteristics of financial instability is conducive to understanding the nature and internal principles of financial markets. Analysis of the volatility characteristics of financial markets must give priority to the analysis of financial chronological order. Financial time series are characterized by differences in financial markets, which are indeterminate orders, and the analysis of their fluctuations becomes crucial for stimulating the microstructure of financial behavior markets. Therefore, in order to give full play to the role of edge computing and promote the controllability of behavioral financial market volatility, this paper used the calculation task load model algorithm, time slot length optimization algorithm, asymmetric thick-tail random fluctuation, and volatility analysis application algorithm to study the subject of how to learn to reduce financial market volatility, summarizing and discussing the experiment. The research results showed that the behavioral financial market volatility mechanism based on edge computing constructed in this paper improved the predictability of financial market volatility by 15%.

1. Introduction

The scale of the financial market and market entities have expanded rapidly. At the same time, with the continuous expansion of the opening of the financial market to the outside world and with the rapid development of financial markets, the volatility of financial risk can be difficult to detect. Financial investments, as a product of our times, are influenced by human behavior, psychological emotions, and other subjective factors. Investors have always made decisions and other issues with a limited degree of rationality. It is of great value to establish a more controllable behavioral financial market. Therefore, the behavioral financial market studied in this paper is of practical value.

Based on research into behavioral finance and the psychology of human decision-making, this paper examined the impact of investors' investment decisions on behavioral financial markets. In the research of the behavioral financial market, many scholars have invested research. Chen W believed that investors' mentality is related to the short-term interaction of financial stocks such as the Shanghai Composite Index, Shenzhen Stock Exchange and Shenwan, and used the time difference correlation coefficient to judge the medium and long-term correlation of each variable [1]. The Colasante A study found that age and geographic location were important determinants of risk-taking in all regions. Furthermore, risk attitudes in both financial and nonfinancial environments are associated with higher levels of risk aversion in nonfinancial environments [2]. Grling et al.

explored how social comparison and competitive motivation explain high risk in fund management. Experiments on asset markets demonstrated this when performance depended on ranking-based incentives [3]. Ferri investigated whether traders behave differently under higher time pressure (fast conditions) versus lower time pressures (slow conditions). Compared with the “fast” condition, the “slow” condition suppressed market price fluctuations and significantly reduced the spread between limit orders and orders, thereby improving payment fairness [4]. The findings of Brenner L showed that Robo-advisory firms appear to be a good option when it comes to finding investment advice, especially for investors who are concerned about possible conflicts of interest [5]. Morone et al. studied the impact of the quality and quantity of trader information on the distribution of benefits in the laboratory financial market. The results lead us to conclude that signal accuracy is important to justify a nonuniform distribution. Furthermore, subjects were overconfident in their signal quality, which created an “additional” difference as signal quality improved [6]. Chauhan Y understood that more financially literate investors recognize the value of financial advice and have a higher willingness to pay. These investors are also less likely to consult a financial advisor if the advisory fee exceeds the investor’s maximum WTP (willingness to pay) [7].

Scholars have carried out a lot of research on the analysis of the behavioral financial market volatility mechanism, but they all directly use data collection and information technology. There are few theories about the use of volatility mechanism analysis to promote the development of behavioral financial markets. Therefore, this paper conducted an in-depth study of how behavioral financial markets utilize volatility mechanism analysis. In order to make the function of the behavioral financial market come into play, many scholars have carried out research on edge computing. Wang et al. proposed a real-time method to estimate the antenna surface of a large-aperture reflector by calculating the antenna panel position based on an edge sensor [8]. Yang et al. used application functions and edge computing algorithms to efficiently compute and reduce the computational tasks of individual edge nodes to achieve balanced task allocation and scheduling, effectively improving the operability and security of the IoT smart substation auxiliary system [9]. Tafrishi et al. designed a new type of filter that simplifies object detection, tracking, display, and more. The existing boundary-based algorithms and tracking algorithms can provide appropriate automatic control for mobile robots, but many algorithms suffer from complex calculations due to their over-reliance on a large number of road signs [10]. For real-time monitoring, Dong et al. implemented boundary calculation of noise monitoring. The goal was to better detect chemical machinery and equipment by monitoring noise pollution. Through mathematical modeling, noise pollution monitoring of chemical machinery and equipment was carried out on the basis of boundary calculation and compared with conventional noise pollution monitoring [11]. Meng et al. proposed a miner state monitor based on long-term memory network edge counting and random forest degradation decision-making, which can

understand the physical condition and working state of miners in real-time and provide a coal mine with guarantees for the health and safety of miners [12]. Du et al. proposed an optimization model for high-end computing confidence evaluation based on graph theory, aiming at the problems of limited equipment resources in the high-end computing environment and ignoring computing load and confidence path iteration in existing confidence models [13]. For high-end computing environments, Song and Bai proposed a dynamic backlight adjustment mechanism for smartphones, which can effectively reduce the power consumption of smartphones while providing visual effects [14]. Although scholars have carried out more research on edge computing, few of their research results are directly related to the behavioral financial market, and edge computing has a short development time, so there are often some problems in actual development and application. In order to address these issues, this paper investigated edge computing for the development of behavioral financial markets.

Due to the current behavioral finance, investors’ rational decision-making methods are limited. At the same time, problems such as cognitive bias and limited rationality have also appeared, and behavioral finance has become more and more volatile in the financial market. In addition, the current research also has the problem that the research system is not systematic enough, the research content is empty, as well as the research object is marginalized. Faced with this situation, this paper used edge computing technology, time slot length optimization algorithm, volatility analysis, and asymmetric thick-tail stochastic volatility model to study behavioral financial market volatility so as to improve the accuracy of behavioral financial market volatility.

2. Behavioral Financial Market Volatility Mechanism Model Based on Edge Computing

2.1. Edge Computing Logic Model. Edge computing is to integrate basic network, computing, storage and application functions into an open platform to achieve the purpose of nearby services [15, 16]. Its applications are all deployed at the edge to improve the responsiveness of network services for real-time business, application intelligence, security and privacy needs. Edge computing is between physical entities and industrial connections or at the top of physical entities. However, cloud computing can still access the historical data of edge computing. Its structure is shown in Figure 1:

As can be seen from Figure 1, the edge computing model is composed of three parts: cloud, edge, and terminal. All three layers can provide resources and services for applications. As the development of IoT applications has led to a large increase in terminal devices, the terminal resources of the IoT are limited, and remote cloud services are often required to provide services to users. If all device data is transmitted to the cloud center for unified processing and then returned to the device, it would inevitably cause great loss and damage to the network connection and data center and also easily overload the cloud core, blocking services and affecting the experience of end-user devices. By providing computing services close to users, the network and resource

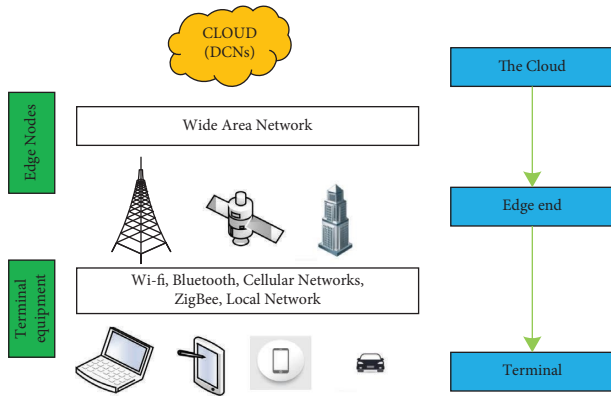


FIGURE 1: Logic structure diagram of the edge calculation.

load of the cloud center can be effectively reduced. Edge computing is not to replace cloud computing but to expand cloud computing and provide a better computing platform for the Internet of Things.

2.2. Behavioral Finance Model. Behavioral finance is a borderline subject that intersects finance, psychology, behavior, sociology and other disciplines and strives to reveal the irrational behavior and decision-making laws of financial markets. It explains, studies and predicts the development of financial markets from the perspective of the specific behavior and psychology of individuals [17, 18]. By analyzing the deviation and inconsistency of the market behavior of financial market entities, it is possible to discover the business philosophy and decision-making behavior characteristics of different market entities in different environments, and try to create a model that accurately reflects real decisions, so that the behavior of market participants and market behavior becomes a model that describes the situation, as shown in Figure 2:

As can be seen from Figure 2, when the price rises, investors' risk aversion decreases, and the decrease in risk aversion leads to an increase in the price, and the exaggerated reaction intensifies. In the case of falling prices, investors' risk aversion has been strengthened, sending prices further lower. The exaggerated response also intensified. Clearly, from two perspectives, changes in risk aversion can lead to overreactions that can be explained by biased expectations. Second, risk aversion to change in time-measured cumulative markets is a positive rate term during high price periods and a disutility term during low price periods. That is, when prices rise, the risk of change increases utility. The total gain is greater than the gain from wealth growth just because of rising prices, and there is an additional positive gain. Likewise, during price declines, risk aversion to change reduces utility, and the overall benefit of the reduction is greater than the reduction in utility, so a reduction in value results in a reduction in resources with no additional benefit. When prices rise, investors feel less risky and feel more rewarded than purely rational investors. Likewise, when prices fall, investors feel riskier and believe they have more to lose than purely rational investors.

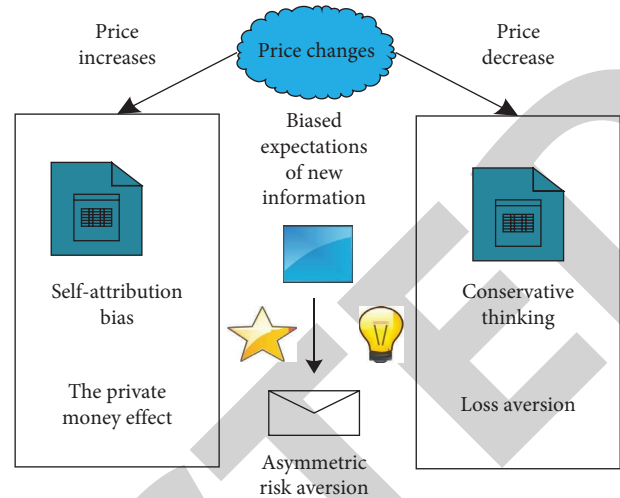


FIGURE 2: A descriptive model of behavioral finance.

Clearly, the role of biased expectations reinforces the role of variable loss aversion in explaining rising market phenomena. In conclusion, the combined effect of variable risk aversion and biased expectations is a phenomenon that reinforces discrete accumulation and cross-sectional models.

2.3. Fluctuation Mechanism Model. In the financial market, the volatility mechanism mainly refers to the standard deviation of the change value of a financial instrument in a specific time frame and is often used to quantify the risk and uncertainty of a financial instrument. It is commonly used to express the movement of stock prices [19].

The most important of these is the fundamental trend of the stock, that is, the situation in which the stock price rises or falls across the board. For investors, if the underlying trend continues to rise, a bull market will form. If it falls, a bear market is formed. The second direction of stock movement is called the secondary trend of stock prices. Because the secondary tendency tends to go in the opposite direction of the primary tendency and restricts it to some extent, it is also called the adjustment of the stock price.

Typically, in both trends, the following features are present: long-term investors are interested in the underlying trend in stock prices, with the aim of buying stocks and selling them in time before a bull market begins [20]. There would be some short-term speculators who would pay more attention to the corrective direction of the stock price in order to make short-term profits. The specific financial market volatility model is shown in Figure 3:

As can be seen from Figure 3, there are roughly two kinds of fluctuations in the behavioral financial market: first, when the stock is undervalued, it directly or indirectly increases the demand for the stock, which in turn stimulates leveraged purchases. Therefore, the increase in the leverage ratio of the stock market results in an increase in the stock price; the second is that when stocks are overvalued, there would be two results: (1) it would directly increase the supply, resulting in a decrease in the leverage ratio of the stock market and a drop in the stock price; (2) there would

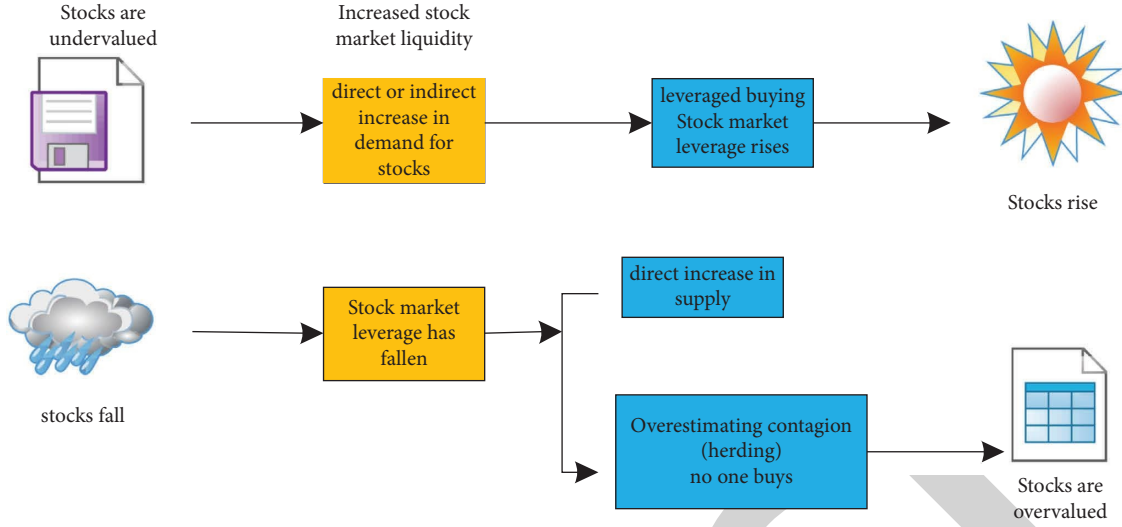


FIGURE 3: Model of the fluctuation mechanism.

be a herd effect due to the contagion of overvalued signals, resulting in a situation where no one takes the order. This situation can also lead to lower stock market leverage and, therefore, lower stock prices.

3. Algorithm Utilization of Behavioral Financial Market Volatility Mechanism Based on Edge Computing

3.1. Computing Task Load Model Algorithm. The computational task load model algorithm combines power consumption and delay factors into one. The load can meet the individual needs of different users, and the relevant factors can be flexibly adjusted [21].

According to the above analysis, the time t required to complete the execution of all computing tasks is

$$t = \max\{t_{loc}^{N_1}, t_{ser}^{N_2}\}, N_1 + N_2 = N. \quad (1)$$

The energy e required to complete all tasks is

$$e = e_{loc}^{N_1} + e_{ser}^{N_2}, N_1 + N_2 = N. \quad (2)$$

The overall load of the system is assumed to be expressed as K :

$$K = \lambda^t t + \lambda^e e. \quad (3)$$

Among them, the coefficients λ^t and λ^e represent the weights of computing task delay and energy consumption when offloading decision-making, respectively. The two coefficients satisfy the following relationship:

$$\begin{cases} \lambda^t + \lambda^e = 1, \\ \lambda^t \geq 0, \\ \lambda^e \geq 0. \end{cases} \quad (4)$$

When λ^t is larger, it means that the user at this time is more concerned about the delay of the calculation and is more sensitive to the delay; when the value of λ^e becomes

larger, it means that the power of the mobile phone of the mobile phone is reduced, so more consideration needs to be given to the power consumption of computing work to improve the battery life of the mobile phone. In this way, the mobile phone user can appropriately determine the weighting factor according to his own situation at the time.

Thus, the goal is to optimize the load P

$$P = \min k. \quad (5)$$

3.2. Time Slot Length Optimization Algorithm. The time slot length is the main factor in reducing the transmission delay of data distribution. Assuming that the data object to be delivered and transmitted contains N data packets in the network, the slot length is represented by the ability to send N data packets in one transmission. The expected delay can be estimated by using the following formula:

$$D_{\text{overall}} = D_{\text{firstArr}} + D_{\text{prop}}. \quad (6)$$

Among them, D_{firstArr} represents the delay when the first batch of n data packets reaches the last hop and D_{prop} represents the transmission delay of transmitting the remaining batches of data packets. D_{firstArr} is obtained by the following formula:

$$D_{\text{firstArr}} = h\tau \frac{n}{q}. \quad (7)$$

Among them, τ is the time required to transmit a single packet lock and q is the average link quality, and n/q is the expected number of transmissions.

Considering the situation of multiple pipelines, when the first batch of data packets reaches the node of the h hop, the second batch of data packets has already reached the node of the $(h-3)$ hop. At this time, D_{prop} represents the following:

$$D_{\text{prop}} = 3 \cdot \frac{n}{q} \left(\frac{N}{n} - 1 \right). \quad (8)$$

Combining the formula, the desired data distribution transmission delay can be calculated by using the time slot length n , so the optimal time slot length n can be obtained by solving the following formula:

$$\begin{aligned} D_{\text{overall}}(n) &= 0, \\ D_{\text{firstall}}(n) &= 0. \end{aligned} \quad (9)$$

3.3. Volatility Analysis. Volatility is related to the range of possible returns for holding a stock and the probability of it occurring. The more volatile a stock is, the wider the range of its possible outcomes and the greater the probability that returns would be at the edge of the range. A portfolio is assumed to be composed of x securities. σ_m ($m = 1, 2, 3, \dots, x$) represents the standard deviation of each security, and W_n ($n = 1, 2, 3, \dots, x$) represents the weight of different securities in the portfolio, then

$$\sigma^2 = \sum_{m=1}^x \sum_{n=1}^x w_m w_n \text{cov}(r_m r_n). \quad (10)$$

Among them, $\text{cov}(r_m r_n)$ ($m, n = 1, 2, 3, \dots, x$) is the covariance of security m and security n . When r_m and r_n are discrete random variables, there are

$$\left\{ \begin{aligned} \text{cov}(r_m, r_n) &= E((r_m - E(r_m))(r_n - E(r_n))) \\ &= \sum_{k=1}^x (r_{mk} - E r_{mk})(r_{nk} - E r_n). \end{aligned} \right. \quad (11)$$

When r_m and r_n are continuous random variables, there are

$$\text{cov}(r_m r_n) = \int_{-\infty}^{+\infty} \int_{-\infty}^{+\infty} (r_m - E(r_m))(r_n - E(r_n)) f(r_m, r_n) dr_m dr_n. \quad (12)$$

The following formula is derived from the standard deviation

$$\sigma^2 = \sum_{m=1}^x \sum_{n=1}^x w_m w_n \rho_{mn} \sigma_m \sigma_n. \quad (13)$$

The matrix form is expressed as

$$\sigma^2 = [W_1 \dots W_x] \begin{bmatrix} \sigma_1^2 & \sigma_{12} & \dots & \sigma_{1x} \\ \dots & \dots & \dots & \dots \\ \sigma_{m1} & \sigma_{m2} & \dots & \sigma_m^2 \end{bmatrix} \begin{bmatrix} W_1 \\ \dots \\ W_m \end{bmatrix}. \quad (14)$$

Among them, σ_{mn} is the covariance of r_m and r_n .

Others are the same as above. Through the above analysis, it can be seen that there are two parts of the risk or variance of the portfolio products: one is the systematic risk that cannot be eliminated, and the other is the unsystematic risk that can be eliminated.

3.4. Asymmetric Thick-Tailed Random Fluctuations. The asymmetric thick-tailed SV (Schedule Variance) is derived from the standard model. If the observation error of the

standard model has a thick-tailed probability distribution, and the perturbation term of the observation formula is related to the perturbation term of the wave equation, a thick-tailed asymmetric model is obtained. Its specific expression is as follows:

$$r_t = \beta_{+0} \sum_{i=1}^p \beta_i r_{t-i} + e^{z_t/2} \varepsilon_t z_{t+1} = \mu + a(z_t - \mu) + \delta_{\eta_t} \eta_t. \quad (15)$$

Among them, $\varepsilon_t \sim dt(0, 1, \omega)$, $\eta_t \sim dN(0, 1)$, and $\text{cov}(\varepsilon_t, \eta_t) = \rho$.

It can be verified that the above transformation is effective, and a transformation is made to ε_t in the new model again, and the parameter m is introduced to satisfy a normal distribution with a mean of 0 and a variance of 1.

There are

$$\varepsilon_t = \gamma \sqrt{1 + \rho^2} + \rho_t. \quad (16)$$

Therefore, there are

$$\text{corr}(\gamma_t, \eta_t) = E((\gamma_t)) \eta_t. \quad (17)$$

Formula (17) is brought in, so the transformed model is

$$r_t = \beta_0 + \sum_{i=1}^p \beta_i r_{t-1} + \lambda_t e^{z_t/2} (\gamma \sqrt{1 - \rho^2} + \rho \eta_t). \quad (18)$$

4. Evaluation of the Fluctuation Mechanism of Behavioral Financial Market Based on Edge Computing

4.1. Research Purpose. This paper uses a computational task load model algorithm, time slot length optimization, volatility analysis, and asymmetric thick-tail stochastic volatility model to study the behavioral financial market volatility mechanism to prove that edge computing has obvious support and guidance for behavioral financial market volatility.

4.2. Research Design. This paper takes the typical herd behavior and loss aversion behavior in the commercial bank credit market as an example to conduct an empirical study on it. It is helpful to explore the significant degree of influence of commercial banks' credit behavior on commercial banks and the research on the analysis of behavioral financial market fluctuation mechanism.

5. Simulation Experiment of Behavioral Financial Market Volatility Mechanism

5.1. Analysis of the Balance of Nonperforming Loans in Commercial Finance. The NPL ratio is determined to check for herding among commercial banks and refers to the tendency of investors to ignore their own valuable private information and follow the decision-making style of the majority in the market. Since the data of different loan balances cannot be directly obtained, the data of different loan balances are obtained according to the relationship

between the nonperforming loan balance and the nonperforming loan ratio. It is mainly an empirical study on data selection and processing of sheep herds in four types of commercial banks: rural, large, urban and stock. Taking 2014–2017 as an example, Figure 4 shows the balance of nonperforming loans.

As can be seen from Figure 4, nonperforming loans in four industries were on the rise from 2014–2017. Large commercial banks had the largest share of nonperforming loans in 2015–2016. Large commercial banks doubled from 300 shares in 2015 to 600 shares in 2016, and joint-stock transaction banks increased from 85 shares to 210 shares. City commercial banks increased from 75 shares to 150 shares, and rural commercial banks increased the least, with only 65 shares.

5.2. Analysis of the Proportion of Nonperforming Loans in Commercial Finance. The monthly ratio of nonperforming loans of banks is an important indicator to measure the safety of bank credit assets. The greater the proportion of nonperforming assets, the higher the ratio of total loans that cannot be repaid; the lower the proportion of nonperforming assets, the less the total amount owed by financial institutions.

The proportion of the nonperforming loan balance of the four types of commercial banks is shown in Figure 5.

As can be seen from Figure 5, large commercial banks dropped from 73% to 50%, with an average proportion of 61.75%; joint-stock commercial banks increased from 13% to 17%, with an average proportion of 18.25%; city commercial banks increased from 8% to 19%, with an average proportion of 13.75%; rural commercial banks increased from 7% to 10%, with an average proportion of about 8.8%. In 2014–2015, large commercial banks accounted for more nonperforming loan balances than the other three banks combined, and rural commercial banks accounted for the smallest quarterly nonperforming loan balance. However, with the continuous change in time, the proportion of the quarterly nonperforming loan balance of large commercial banks continued to decline, and the proportion of the other three types of commercial banks showed an upward trend, among which the proportion of rural commercial banks increased the most rapidly.

5.3. Analysis of Nonperforming Loan Ratio of Commercial Finance. The nonperforming loan ratio refers to the proportion of bad debts in financial institutions. Nonperforming loans are five types of loans, normal loans, prospect loans, concern loans, doubtful loans and losses, all of which are called nonperforming loans.

The nonperforming loan ratios of the four types of commercial banks are shown in Figure 6.

From Figure 6, it can be seen that from 2014 to 2017, commercial banks showed a trend of first falling and then rising. Among the four types of banks, rural commercial banks have the highest nonperforming loan ratio, and joint-stock commercial banks have the lowest nonperforming loan ratio at the beginning. However, by 2015, city

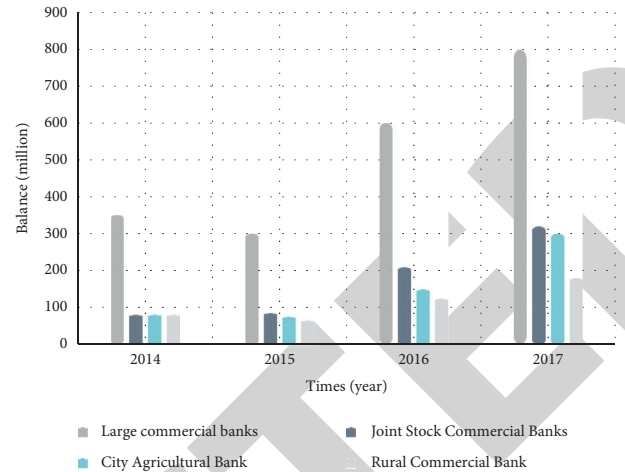


FIGURE 4: The quarterly nonperforming loan balance of commercial banks.

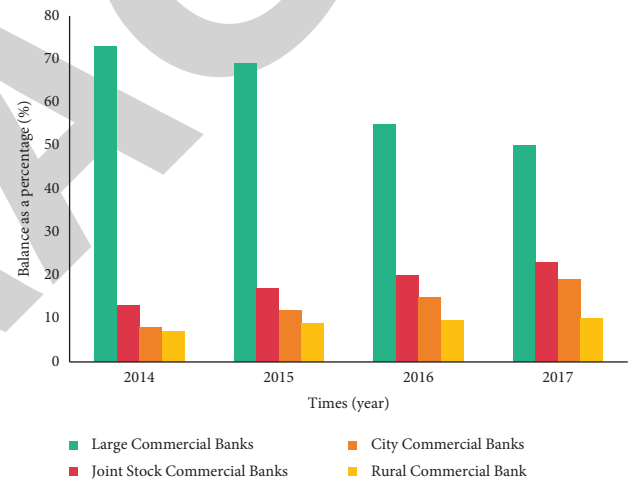


FIGURE 5: Trend chart of outstanding nonperforming loans of all banks.

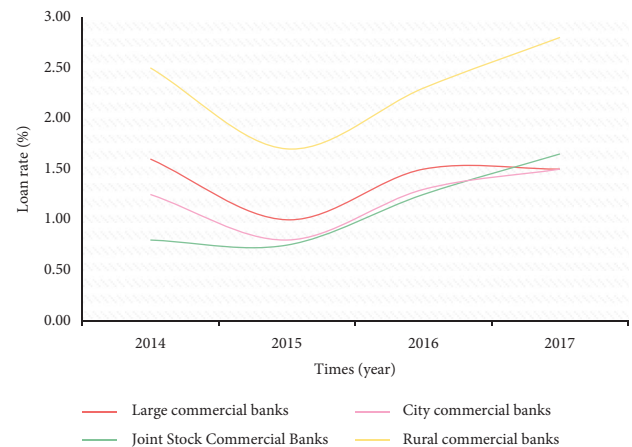


FIGURE 6: Quarterly nonperforming loan ratio of commercial banks.

commercial banks became the lowest. As calculated from Figure 6, the quarterly NPL ratio of large commercial banks averaged 1.4%; the average quarterly nonperforming loan ratio of joint-stock banks was 1.11%; the average quarterly nonperforming loan ratio of urban commercial banks was 1.21%; the average quarterly nonperforming loan ratio of rural commercial banks was 2.325%.

Therefore, the balance of nonperforming loans, the ratio of nonperforming loans and the sum of various loans of joint-stock commercial banks, city commercial banks and rural commercial banks always show the same upward or downward trend as the data of large commercial banks. Therefore, there is herding behavior among these four commercials and financial markets.

5.4. Analysis of Edge Computing. The rapid development of global smartphones has promoted the development of mobile terminals and edge computing. For the Internet of Things, the breakthrough of edge computing technology means that many controls can be completed directly at the local edge computing layer without going through the cloud. This would greatly improve the efficiency of data processing and reduce the data load. Because it is closer to the user, it is also possible to react more quickly to the user, thereby handling demands at the edge. The edge computing benchmark architecture in the Edge Computing Consortium includes aspects such as devices, networks, data, and applications. Platform providers mainly provide hardware and software infrastructure in terms of network interconnection, computing power, data storage, and application.

In addition to the commonly used computational task offloading algorithms for performance analysis, the proposed algorithm is compared with the following algorithms:

- (1) Local execution: all computing tasks are executed locally without task unloading
- (2) Execution on the cloud: all computing tasks are offloaded to the cloud for execution, not locally
- (3) Greedy Unloading: when the task is unloaded, the greedy strategy is used

The selection of parameters is shown in Table 1:

If the current local CPU (Central Processing Unit) is idle, it would be executed locally. When the launcher is inactive, the task would be transferred to the cloud for execution; referring to the required parameters in Table 1, Figure 7 shows a graph of the average task latency for each method with different numbers of computational tasks.

From Figure 7, it can be seen that the local execution has the highest latency, which indicates that task offloading can reduce the task execution time. The average latency of local execution, on-cloud execution, and federated task offloading increases with the number of tasks, and on-cloud execution tends to grow much faster than federated task offloading because all on-cloud tasks are executed in the cloud. When there are too many tasks, the task waiting time also increases rapidly, and in order to unload common tasks, some tasks are executed locally. It is equivalent to executing some tasks in parallel, reducing the task delay. At the same time, it can

TABLE 1: Reference table to the relevant parameters of edge calculation.

Id	Symbol	Value	Meaning
1	N	20	Number of tasks to be performed
2	P_{cup}	0.5 W	The computational power of the local CPU
3	p_{tu}	2W	Mobile devices transmit power
4	f_{ico}	1GHz	The computing power of mobile devices
5	ω	1MHz	Channel bandwidth

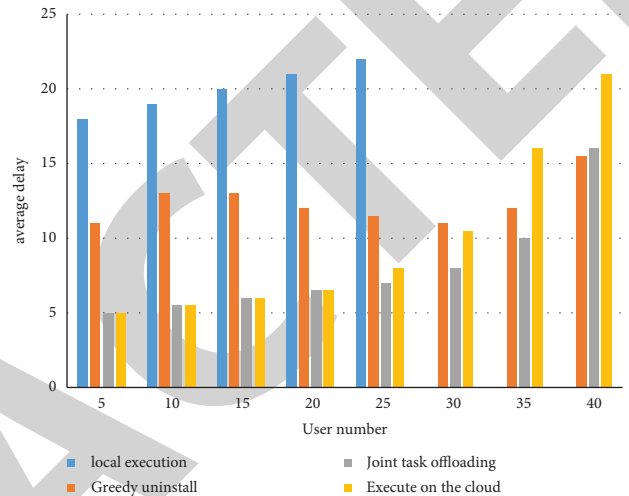


FIGURE 7: Average latency under different task numbers.

be seen that when the number of tasks is less than a certain value, the delays of cloud execution and joint task offloading are very close. Because when there are few tasks, most tasks are offloaded to the server for execution, and as the number gradually increases, only some tasks are scheduled to be executed locally. The obvious difference is the greedy implementation, where the average latency first increases, then decreases, and then continues to increase. This is because, in the beginning, for cloud execution and offloading of shared tasks, the local CPU (central processing unit) is idle. Therefore, greedy execution puts a large part of the task on local execution. However, the latency of local execution should be much larger than that of cloud execution, so the average total latency is initially increased; because the execution speed on the cloud is faster, more tasks would be arranged to be offloaded to the cloud for execution, which would reduce the overall average delay; however, the rewards for offloading tasks are also limited. The average total latency also increases when there are more tasks. The behavioral financial market volatility mechanism combined with edge computing improved the predictability of financial market volatility by 15%.

6. Conclusion

Due to the current behavioral finance, investors' rational decision-making methods were limited, and problems such as cognitive bias and limited rationality also appeared, and behavioral finance fluctuated more and more in the financial market. In addition, the current research also had some

problems, such as a one-sided analysis of the behavioral financial market fluctuation mechanism of edge computing. Therefore, in the face of this situation, this paper studied the behavioral financial market volatility by using the model established by related algorithms so as to improve the accuracy of behavioral financial market volatility.

Data Availability

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

- [1] W. Chen, S. Zhou, and Y. Zhang, "A study of multi-scale relationship between investor sentiment and stock Index fluctuation based on the analysis of BEMD spillover Index," *Journal of Systems Science & Information*, vol. 9, no. 4, pp. 399–420, 2021.
- [2] A. Colasante and L. Riccetti, "Financial and non-financial risk attitudes: what does it matter?" *Journal of Behavioral and Experimental Finance*, vol. 3, no. 90, pp. 54–69, 2021.
- [3] T. Gärling, D. Fang, M. Holmen, and P. Michaelsen, "Financial risk-taking related to individual risk preference, social comparison and competition," *Review of Behavioral Finance*, vol. 13, no. 2, pp. 125–140, 2021.
- [4] G. Ferri, M. Ploner, and M. Rizzolli, "Trading fast and slow. The role of deliberation in experimental financial markets," *Journal of Behavioral and Experimental Finance*, vol. 32, no. 709, pp. 100593–593, 2021.
- [5] L. Brenner and T. Meyll, "Robo-advisors: a substitute for human financial advice?" *Journal of Behavioral and Experimental Finance*, vol. 25, no. 5, pp. 100275–275, 2020.
- [6] A. Morone and R. Caferra, "Inequalities in financial markets: evidences from a laboratory analysis," *Journal of Behavioral and Experimental Economics*, vol. 10, no. 64, pp. 101–584, 2020.
- [7] Y. Chauhan and D. K. Dey, "Does financial literacy affect the value of financial advice? A contingent valuation approach," *Journal of Behavioral and Experimental Finance*, vol. 25, no. 5, pp. 100268–268, 2020.
- [8] C. S. Wang, Y. F. Yan, Q. Xu et al., "Edge sensor based real-time calculation method for active panel position of QTT," *Research in Astronomy and Astrophysics*, vol. 20, no. 11, pp. 182–251, 2020.
- [9] C. Yang, J. Wu, B. Tao, X. Zhang, L. Li, and H. Qu, "Study of Internet of Things technology applied in intelligent substation auxiliary system," *IOP Conference Series: Materials Science and Engineering*, vol. 719, no. 1, pp. 012009–012090, 2020.
- [10] S. A. Tafrihi, X. Dai, and V. Esmailzadeh Kandjani, "Line–Circle–Square (LCS): a multilayered geometric filter for edge-based detection," *Robotics and Autonomous Systems*, vol. 137, no. 9, pp. 103732–732, 2021.
- [11] X. U. Dong, H. T. Huang, and D. Y. Liu, "Noise pollution monitoring application of chemical equipment based on edge calculation," *Adhesion*, vol. 11, no. 59, pp. 187–246, 2019.
- [12] Y. Meng, J. Li, and M. Zhang, "Miner condition monitoring equipment based on LSTM edge calculation and random forest fog decision," *Coal Mine Machinery*, vol. 5, no. 34, pp. 21–89, 2018.
- [13] R. Z. Du, K. Xu, and T. Qi, "An optimization model for trust evaluation of edge computing based on graph theory," *Engineering Science and Technology*, vol. 56, no. 8, pp. 150–158, 2020.
- [14] L. Song and G. Bai, "Backlight adjustment mechanism for smartphones for edge computing environments," *Small Microcomputer Systems*, vol. 12, no. 39, pp. 88–94, 2018.
- [15] S. Li and Y. Yan, "DATA-driven shock impact of COVID-19 on the market financial system," *Information Processing & Management*, vol. 59, no. 1, Article ID 102768, 2022.
- [16] H. Li and L. Gu, "Image processing technology in Shanghai Stock Exchange options based on state-space model," *Journal of Electronic Imaging*, vol. 31, no. 5, Article ID 051414, 2022.
- [17] B. Fong, "Analysing the behavioural finance impact of 'fake news' phenomena on financial markets: a representative agent model and empirical validation," *Financial Innovation (English)*, vol. 7, no. 1, pp. 53–35, 2021.
- [18] A. I. Mokhtar and S. Metawa, "Investor psychology perspective: a deep review on behavioral finance," *American Journal of Business and Operations Research*, vol. 0, no. 1, pp. 08–25, 2019.
- [19] Z. Xu, G. Zhu, N. Metawa, and Q. Zhou, "Machine learning based customer meta-combination brand equity analysis for marketing behavior evaluation," *Information Processing & Management*, vol. 59, no. 1, Article ID 102800, 2022.
- [20] X. Li and Y. Sun, "Stock intelligent investment strategy based on support vector machine parameter optimization algorithm," *Neural Computing & Applications*, vol. 32, no. 6, pp. 1765–1775, 2020.
- [21] L. Ni, X. Sun, X. Li, and J. Zhang, "GCWOAS2: multiobjective task scheduling strategy based on Gaussian cloud-whale optimization in cloud computing," *Computational Intelligence and Neuroscience*, vol. 2021, no. 21, pp. 1–17, 2021.