

# The Evaluation Method of Investment Risk of Financial Enterprise based on Multimedia Network

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**Abstract:** In recent years, with the rapid development of the capital market, more and more enterprises and individuals have begun to engage in various financial enterprise investment activities. Information asymmetry often exists in financial enterprises, which brings some risks to their marketing, pricing and investment. Through the analysis of the investment risk of financial enterprises based on multimedia network, the measurement platform of financial investment risk is built, and the investment risk assessment is realized by relying on the selected risk assessment indicators, so as to complete the research of this paper. The empirical analysis proves that compared with the traditional investment risk assessment method, the accuracy of investment risk assessment method designed in this paper is 19.5% higher, and the time of investment risk assessment is greatly shortened.

**Keywords:** Multimedia network; Financial enterprise; Investment risk; Risk assessment; Internet

## 1. Introduction

With the acceleration of China's modernization process and the popularization of the Internet, the economic development presents a new type of ecological environment based on the Internet. Internet finance has a huge impact on the change of China's overall economic structure and economic growth model. In the Internet era, the competition among financial enterprises will be carried out comprehensively on the network information platform. In the final analysis, data is the king. Who has the data, who has the risk pricing power, who can get high risk returns, and finally win the competitive advantage. In a broad sense, financial enterprise investment refers to the investment that relies on the financial market to buy and sell all financial assets. In a narrow sense, financial investment refers to investment in securities, that is, investment through buying and selling stocks and bonds[1]. Financial investment can enable investors to obtain higher investment returns in the future, but also to bear greater investment risks, once the investment mistakes will be difficult to reduce their losses. Financial investment risk refers to the possibility that financial investors suffer losses in financial investment activities.

## 2. Investment Risk Analysis of Financial Enterprises based on Multimedia Network

### 2.1. The current situation of financial enterprises based on multimedia network

Financial enterprise refers to an enterprise that needs to obtain a financial business license granted by the financial regulatory department for the execution of its business. It includes postal savings Banks, state-owned commercial Banks, joint-stock commercial Banks, trust and investment companies, financial asset management companies, financial leasing companies and some financial companies that need banking licenses, securities companies, futures companies and fund management companies that need to obtain securities business licenses, and all kinds of insurance companies that need to obtain insurance business licenses. Financial enterprises with multimedia network refer to those engaged in financial business related to banking licensing based on multimedia technology and network technology, and have certain competitive relations with traditional financial enterprises. It comes into being with the continuous development of the Internet industry, and has a profound impact on traditional finance and a huge impact. The financial enterprise based on multimedia network is a new financial business model that the traditional financial institution and the Internet enterprise use the Internet technology and the information communication technology to realize the fund financing, the payment, the investment and the information intermediary service. Its main business types include Internet payment, online lending, equity crowdfunding, Internet fund sales, Internet insurance, Internet trust and Internet consumer finance, etc[2]. From the perspective of the development history of the Internet, Internet finance is a functional financial industry and its service system formed on the open Internet platform rely-

ing on big data and cloud computing. It develops rapidly along with e-commerce. Its core resource is big data and its core technology is cloud computing.

Internet finance has many characteristics that are different from traditional financial institutions, including open resources, cost intensification, choice marketization, Internet channels, efficient operation and value of user behavior. What these features are traditional financial does not have, also is the Internet financial unique advantages, but as a new thing, it also exposed some problems in the process of development, embodied in the following aspects: management is weak, industry self-discipline is loose, and external supervision and the lack of legal norms, the credit system is not perfect, credit information exchange with difficulty, high risk[3].

**2.2. Investment risk analysis of financial enterprises based on multimedia network**

Financial investment risks can be divided into systematic risks and non-systematic risks according to the scope of risks. Systemic risk is a common risk faced by all investors in an investment field, and it is an unavoidable risk. For example, in the stock market, all stock prices fluctuate due to monetary policy, inflation, political events and other factors. The impact of such risks on enterprises

varies in degree, but all enterprises have to face it, which is a kind of risk that cannot be dispersed. Non-systematic risk is the possibility that some unique events which affect the return of a certain investment product will lead to the loss of investors. For example, due to the disclosure of litigation cases, investment mistakes, fraud of internal managers and other events of a company, the company's stock price may fall sharply[4]. This kind of risk becomes the uncertainty of the enterprise itself only, do not produce effect to other enterprise, it is dispersible risk. Therefore, there are many control measures for non-systematic risks.

As an emerging industry combining Internet and finance, the development of financial enterprises based on multimedia network is still in the exploration stage. Due to the high-risk characteristics of the industry itself, the risk of combining the two will be greater than that of a single industry. Specifically, the main investment risks faced by financial enterprises based on multimedia network include market risk, operational risk, credit risk, liquidity risk and reputation risk. The investment risks of financial enterprises based on multimedia network after integration and summary are shown in figure 1.

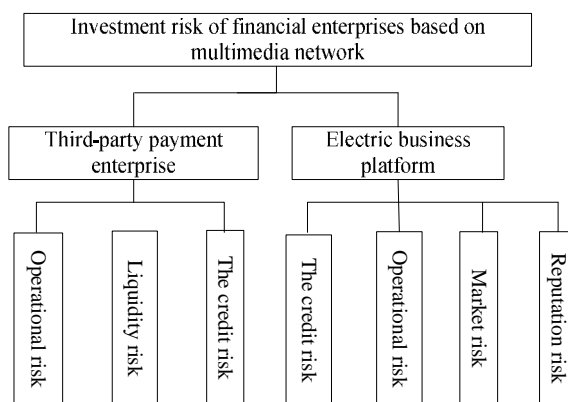


Figure 1. Financial enterprise investment risk summary chart based on multimedia network

**3. Measurement of Financial Investment Risk**

Through the analysis of investment risk of financial enterprises based on multimedia network, the measurement platform of financial investment risk is established. The measurement platform of financial investment risk is to divide an entity virtual host into several "virtual" hosts through virtual host technology. This technology can make each virtual host have complete IP address, independent domain name, and complete network server

function. Virtual host according to the system level, component composition, storage space size is divided into various models. The application of ENC28J60 module ensures the stable operation of the platform, and the LCD12864 module makes the measured data present a visual state. Financial enterprises based on multimedia network can completely choose the most suitable virtual host according to their actual situation[5]. The structure of the measurement platform for financial investment risk is shown in figure 2.

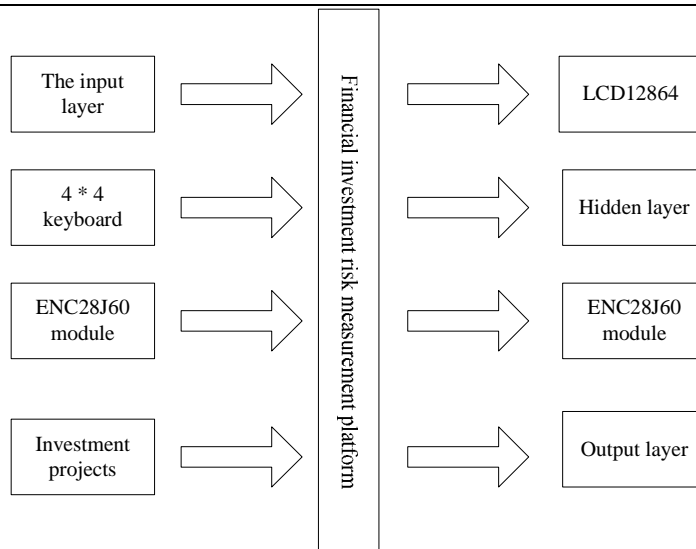


Figure 2. Financial investment risk measurement platform structure diagram

The input layer design of financial investment risk measurement platform, after data screening, produced including: market demand intensity, technology investment (with 10% as the boundary), the initial external obstacles, team job vacancies, the development of the detailed roadmap and other major influencing factors, will be used as the input investment risk measurement platform.

Financial investment risk measurement platform output layer design. According to the sample data, the outcomes of entrepreneurial enterprises can be divided into four categories: 0, 1, 2 and 3. The number of output neurons of the designed network is 1, and its value is 0, 1, 2 and 3, representing different outcomes of each enterprise. Select the linear function (purelin) as the output layer transfer function.

Financial investment risk measurement platform hidden layer design. Because a three-layer BP neural network can complete arbitrary mapping, this paper adopts the design of a hidden layer, but the determination of the number of neurons in the hidden layer is very complicated. Generally, the more hidden layer neurons there are, the more robust the network will be. Therefore, it is particularly important to determine an appropriate number of neurons in the hidden layer[6]. According to the preliminary judgment, the number of hidden layer neurons in this network is between 6 and 20. The hidden layer transfer function is designed by logarithmic -S - type function.

#### 4. The Realization of Investment Risk Assessment of Financial Enterprise based on Multimedia Network

##### 4.1. Selection of risk assessment indicators

From the perspective of the measurement platform of financial investment risk, six indicators are selected, which are: information centralized processing capacity, information transparency, historical success rate, big data guidance, capital utilization rate and professional service level.

The centralized processing ability of information, in this case, refers to the enterprise's ability to identify and feedback financial data, which is the matching ability of the term and quantity of capital supply and demand. Information transparency, Internet financial is attractive, largely related to its characteristics of openness, fairness and justice, transparent information platform, weakened the degree of asymmetric information, convenient for investors to quickly capture the real information effectively, accelerate the matching of investors and the investors, increase the success rate of investment; The historical success rate means whether an investment platform does well or not. Its historical success rate is of great reference significance[7]. A variety of information on finance, management, credit, etc., also reflects a variety of preferences in the platform's ability to convert loans. As lufax and other large online lending platform, will be relatively easy to provide investors with stable investment; The guidance degree of big data, the arrival of the era of big data, the huge network data, the guidance investment platform has a lot of user data that the traditional financial industry does not have, but also easy to quantify; Capital utilization rate, relying on big data and Internet technology, can easily obtain more effective information at a lower human and material cost than the traditional financial industry. This cost reduction enables the investment platform to make profits while squeezing out profits for investors and small and medium-sized enterprises to achieve a win-win situation. Professional

service level, good platform management ability and good customer service experience are also the weights selected by investors and small and medium-sized enter-

prises[8]. The relationship diagram between each indicator is shown in figure 3.

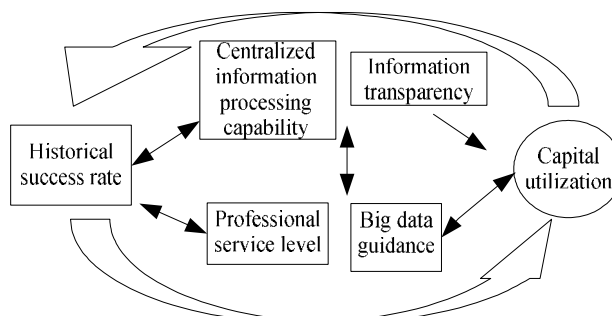


Figure 3. Schematic diagram of risk assessment indicators

The risk evaluation index is evaluated according to the score value of risk degree evaluation, so as to determine the size of risk. The higher the score value is, the greater

the risk will be. Risk assessment index score is shown in figure 4.

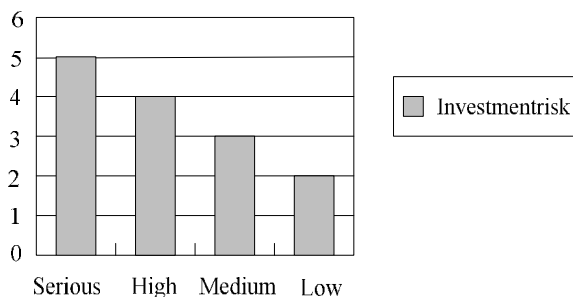


Figure 4. Risk assessment index score

Based on the selected risk assessment indicators, combined with the risk assessment index score, the influence effect of risk factors is calculated to lay a foundation for the realization of risk assessment.

4.2. Risk measurement implementation

The risk assessment of financial enterprises based on multimedia network is based on the analysis of loss data in the past, and the method of probability theory and mathematical statistics is used to estimate the loss frequency and degree of a specific or several risk accidents. The measurement of financial investment risk is to estimate the loss frequency and degree of one or several financial investment instruments by using the above methods[9]. Suppose  $X_1, X_2, \dots, X_n$  is the rate of return of some financial investment, and  $E(X)$  is the mathematical expectation of random variable. The calculation formula is as follows:

$$E(X) = \sum_{i=1}^n X_i \tag{1}$$

$[X_i - E(X)]^2$  is the square deviation of the observed value  $X_i$ . The arithmetic mean of  $[X_1 - E(X)]^2, [X_2 - E(X)]^2, \dots, [X_i - E(X)]^2$  is the mean square deviation, or variance, of this group of data. The expression formula is shown in formula 2:

$$S^2 = \frac{1}{n} \sum_{i=1}^n X_i [X_2 - E(X)]^2 \tag{2}$$

Sigma is the measure of the degree of dispersion of measured values and average values. The larger the standard deviation is, the greater the degree of dispersion of random variables in the data is. The greater the possibility of loss and the greater the risk of investment. When the expected value is equal or relatively close, the comparison of the risk size can be directly conducted with the standard deviation. If the expected value of two groups of distributions is obviously different, the coefficient of variation should be used for comparison[10]. The coeffi-

cient of variation is the ratio of standard deviation to expected value. The expression formula is shown in formula 3:

$$V = \frac{S}{E(X)} \tag{3}$$

In general, the smaller the coefficient of variation, the less likely the risk.

Investment can enable investors to obtain higher investment returns in the future, but also to bear greater investment risks, once the investment mistakes will be difficult to reduce their losses. Through the analysis of the investment risk of financial enterprises based on multimedia network, the measurement platform of financial investment risk is established, and the investment risk assessment is realized by relying on the selected risk assessment indicators.

### 5. The Simulation Test

In order to verify the effectiveness of the investment risk assessment method for financial enterprises based on multimedia network proposed in this paper, a simulation test was conducted. In the process of the test, traditional multimedia network financial enterprises were selected as simulation objects to verify the accuracy of the investment risk assessment method. In the process of the experiment, two different investment risk measurement

methods are taken as the experimental objects to carry out the simulation experiment. The experimental results of risk assessment of the two simulations were recorded and presented in the same data chart.

#### 5.1. Data preparation

In order to reduce the influencing factors of the simulation experiment and ensure the accuracy of the experiment process and results, the simulation experiment environment was set. The memory of the PC used in the simulation experiment is 4G DDR3, which is configured as core CPU T4300. The traditional investment risk assessment method is used for simulation comparison experiment. The total number of investment risk factors is set as N, and there are N different data space attributes. The set constituted by the number is (a1, a2... , the set of attributes is (b1, b2... Bn), the effective number of investment risk to be tested is ai, and its spatial attribute is bj. The return rate and risk coefficient of simulated investment are shown in table 1. Using two different investment risk measurement methods, the possibility of investment risk is calculated.

#### 5.2. Results analysis

The test results of two different investment risk assessment methods are shown in table 1:

Table 1. Comparison of test results

Assessment method	Return on investment	Risk factor	Accuracy %
Traditional investment risk measurement method	95%	low	73.9%
The investment risk measurement method proposed in this paper	85%	medium	95.4%
Test parameters set by simulation	84.5%	Have investment net loss, but do not have an effect basically to business activity of the enterprise	/

According to the simulation results in Table 1, the accuracy of the investment risk assessment method designed in this paper is 19.5% higher than that of the traditional investment risk assessment method.

In order to further prove the superiority of the investment risk assessment method designed in this paper, the number of investment risk factors was gradually increased in the simulation experiment. The traditional investment risk assessment method and the investment risk assessment method proposed in this paper were used for risk assessment, and the evaluation time was recorded. The obtained simulation results can be shown in Figure 5.

As can be seen from figure 5, the evaluation efficiency of the investment risk assessment method designed in this paper is significantly higher than that of the traditional investment risk assessment method. The simulation experiment proves that the investment risk assessment method designed in this paper can significantly improve the accu-

racy and work efficiency of the investment risk assessment.

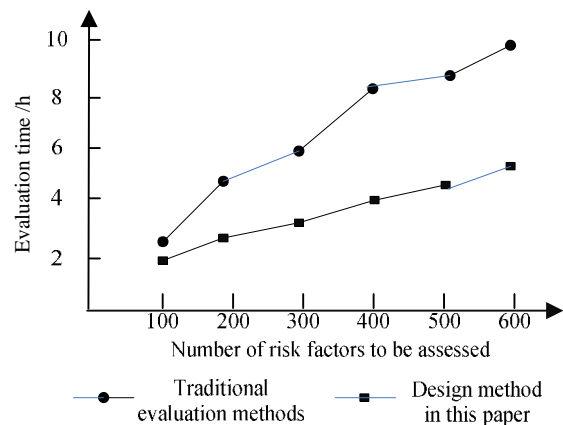


Figure 5. Comparison of time consumption of the two investment risk measurement methods

## 6. Conclusions

This paper proposes a method to evaluate the investment risk of financial enterprises based on multimedia network. Through the analysis of the investment risk of financial enterprises based on multimedia network, the measurement platform of financial investment risk is built, and the investment risk assessment is realized by relying on the selected risk assessment indicators, so as to complete the research of this paper.

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