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Retraction

Retracted: Multiobjective Optimization Algorithm for EFRM Strategy

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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

(1) Discrepancies in scope

(2) Discrepancies in the description of the research reported

(3) Discrepancies between the availability of data and the research described

(4) Inappropriate citations

(5) Incoherent, meaningless and/or irrelevant content included in the article

(6) Peer-review manipulation

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

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

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

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

References

[1] W. Jiang, X. Wang, and X. Wu, "Multiobjective Optimization Algorithm for EFRM Strategy," *Security and Communication Networks*, vol. 2022, Article ID 4994383, 12 pages, 2022.

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Research Article

Multiobjective Optimization Algorithm for EFRM Strategy

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With the rapid development of the global economy in recent years, market competition has become more and more intense. Therefore, the market competitiveness of the enterprises is becoming higher and higher. Among them, the enterprise financial risk management (EFRM) is one of the key factors that decide the enterprise market competition. It also shows that enhancing the enterprise market competition needs to strengthen the enterprise's financial control and management, with the method of reasonable controlling of enterprise financial risk (EFR). The current research and development status of EFRM is combed, the theory of financial internal control and its significance are expounded, the related concepts of the company's financial internal control are studied, and the definition, classification, basic features, and causes of financial risk are analyzed in this paper. Finally, a company is taken as research object, the characteristics and status quo of the company's financial risk system are studied, and its existing problems are analyzed, a mathematical model for the company's FRM is built, and the multiobjective optimization algorithm is used to optimize the model, to improve the level of a company's FRM performance and market competitiveness and to guard against the company's financial risk.

1. Introduction

With the process of economic globalization, the market economy competition environment is becoming more and more intense; there are many companies bankrupt because of poor management around the world every day. Improving enterprise management model is an effective way to improve the enterprise market competitiveness, which attracted more and more attention from people [1–4].

Figure 1 shows the schematic diagram of enterprise risk classification.

According to Figure 1, it shows that the risk of enterprise can be divided into enterprise financial risk (EFR) and enterprise management risk (EMR). EFR can be divided into funding risk, investment risk, return on risk, and distribution risk. And EMR can be divided into development of failure risk, risk of product quality standardization, evil competition risk, and risk of product out of date. Enterprise risk is everywhere [5–8]; thus, optimizing company management strategy, making enterprise risk in a reasonable evaluation is an important way to keep an enterprise developing healthy for a long time.

Financial risk management (FRM) is a branch of risk management, which is a risk management method developed from experience. Mellichamp et al. [9–11] studied the development of the market economy law, analyzed the concepts such as profit, risk, and investment, and studied the method of optimization to reduce the enterprise operational risk. Lu and Chen [12] took network company as a research object, the convolutional neural network method was used to establish the network company supply chain risk model, the researchers of the supply chain risk characteristics are analyzed in detail, and some targeted suggestions are put forward, in order to reduce the company's operational risk providing a certain theoretical support.

The development of the financial internal control theory mainly experienced the following stages [13–20].

First is the infancy stage of early financial. The ancient Roman palace "double billing system" is the earliest financial internal control system, and the system clearly uses the methods of double bookkeeping, regular assessment, and examination of cheating to achieve the purpose of supervising the economy and controlling financial revenue and expenditure.

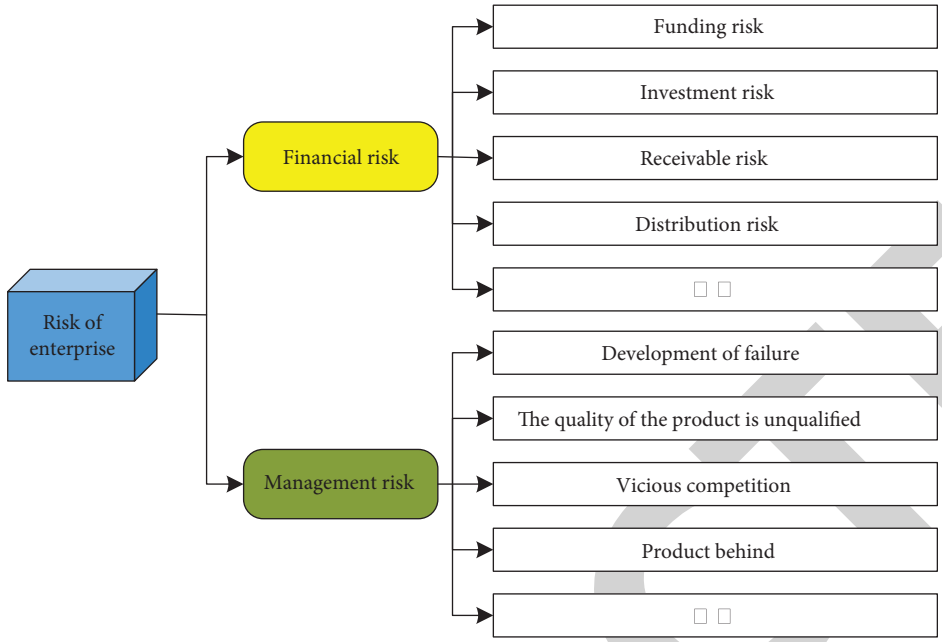

Figure 1: Schemes of enterprise risk classification.

Second is the development stage of the modern financial internal control system. Since the second industrial revolution, the international economic market developed greatly, governments and companies have gradually realized the importance of financial securitytherefore, the research on financial internal control theory and financial internal control mode has been paid more and more attention, and has been widely practiced and promoted in the company's operation. At the beginning of the 20th century, American Lawrence [21–23] created the financial security management method in the first time and put forward the concept of internal check. It mainly refers to financial personnel management, which means the method of clear division of duties, realizing people or departments to manage economic business. And combining with the method of cross check and cross control to restrain each business management, it also has strict accounting registration system to implement the company's internal financial personnel management of the company's financial management. In the middle of the 20th century, there was a fast development and promotion of the concepts and theories of enterprise financial internal control primarily because it is to protect the enterprise assets. Enterprise data accounting is an important mean of accuracy reliability recording, which can improve economic efficiency of enterprises and ensure enterprise policies run smoothly.

Third is the mature stage of financial internal control. There several important landmark events of financial internal control development mature as follows [24–30]. (1) In 1985, the U.S. government organized the national anti false financial reporting Committee and COSO committee jointly with the Institute of certified public accountants, the Accounting Association, the managers' Association, the Institute of internal auditors, the Institute of management accountants, etc. The institute of internal auditors, management accountant association formed the national commission against false financial report and the Committee of sponsoring Organizations (COSOs). They studied the method of avoiding fraud in financial statements. (2) In 1988, American audit committee issued accounting statements audit in the attention to the internal control structure; it was the first time the financial internal control theory was put forward and pointed out that the financial internal control structure is to use various policies and procedures on the enterprise's financial situation and economic goals, which can provide a reasonable and effective guarantee. (3) In 1992, the American COSO committee explained that the company's financial internal controls the composition of the factors in detail once again and pointed out that the control activities, the control environment, risk assessment, information and communication, and supervision constitute are the important factors of internal control. In the same year, the card DE Burleigh company of British took corporate governance as a breakthrough point and studied the quality of financial reporting and the relationship between the financial internal control and corporate governance. The research results showed that financial internal control is one of the frameworks of corporate governance, improving that the internal control mechanism is the clear requirement of corporate governance. These financial internal control typical events marked the financial internal control theory as gradually mature.

Fourth is the new development stage of financial internal control. In 21st century, the United States credibility problem caused exposure of more than a dozen companies such as Enron, WorldCom's company financial fraud [31, 32]. It is seriously influenced the whole bidding market for a long time and the economic recovery of U.S. These series of events showed that enterprise financial internal control institution running failure will bring serious consequences,

but it will promote the development of the company's financial internal control mechanism and perfect. At present, the relevant financial internal control system and the rules and regulations have been studied and specified by the government and enterprises, and they played a positive role in assistance and specification.

At present, the financial internal control has become an important mean of enterprise management. It has the advantageous of enterprise resources reasonable configuration, which can improve enterprises management efficiency and helpful to risk prevention, financial controlling, and reducing loss. Related theory of EFRM was introduced in this paper, the model of EFRM was built, and the multiobjective optimization theory and its algorithm were combined to solve the EFRM model. The purpose of this study is to improve the level of EFRM and provide a certain theoretical guidance to enterprise management. Finally, a company is taken as a researching example, the characteristics of the company's FR management structure are analyzed, and the researched EFRM model and its solving method are used to model and solve the model of company's financial internal control system, which will provide a theoretical support to improve the enterprise management level.

2. Related Works

2.1. Introduction of Business Risk-Related Theory. The enterprise risk management process is shown in Figure 2.

Due to Figure 2, the enterprise risk management is mainly composed of risk management records, monitoring, planning, risk response, risk scope definition, and risk orientation (managing risk log and monitoring risk, planning and risk response, define the scope and the identify risks, risk analysis) six function modules. In the process of enterprise risk management, these six functional modules are interrelated and affect each other, and there is no established sequence for disposal.

In this paper, the EFRM strategy optimization problem is studied; the first FR refers to the enterprises in the financial activities because the internal environment is all sorts of unpredictable or uncontrollable factors, in a certain period of enterprise's actual financial income and financial revenue forecast deviation, thus the possibility of loss.

The EFR can be divided into financing risk, investment risk, return on risk, and distribution risk, as shown in Figure 1. In order to optimize the EFRM strategy, it needs to analyze the various indicators of risk and control risk reasonably.

EFR is everywhere, and risk will change with the progress of the environment and the event constantly. Therefore, risk identification, risk measurement, and risk controlling should be changed over time.

Employees should understand risk correctly, grasp the characteristics of risk, insight into the dialectical relationship of risk and environmental changes, and master the methods of risk management. It gives vital importance to the event, and an important matter of enterprise must be careful treatment.

Risk is inevitable in the process of enterprise operation. In terms of efficiency, generally high risk comes with high benefit and low risk corresponds to low income. In the progress of enterprise financial management, financial statements can provide enterprise's financial position, operating results and cash flow, and other financial information to managers, which will provide the foundation for enterprise financial management decision support.

Nowadays, the main measures used to guard against EFR are as follows. First, capital flow: (1) Improving the efficiency of fund using: this is the basis for prevention and controlling of fundraising risk because companies servicing money comes from earnings. If the enterprise is with poor management and long-term losses, although it has an effective cash management, it will lead to the pressure of the enterprise unable to pay the debt principal and interest on schedule. (2) Moderating debt and optimizing the capital structure: indebtedness is a double-edged sword; it brings higher yields but also brings greater funding risk loss. So, enterprises must be moderate debt management. Determining the "degree" of moderate debt is a complex and difficult problem. In theory, application of the optimal capital structure theory can meet the low comprehensive cost of capital and raising enterprise value maximization. In practice, it should be adapted to the specific circumstances of the enterprise. For some enterprises with good production business operation and faster moving capital stock, its debt ratio may be more appropriate. While, for enterprises with poor operation and slow capital turnover, their debt ratio should be appropriately lower. (3) Reasonable collocation of current liabilities and long-term liabilities: the proportion of current liabilities and long-term liabilities shall be corresponded to the enterprise capital condition.

Second is about investing. (1) Strengthening the feasibility study on investment plan: if an enterprise can make reasonable projections for the future earnings before investment, the scheme of high risk and low profits should be excluded. Money should only be put into those feasible solutions, which will prevent and control the investment risk. (2) Application of portfolio theory to portfolio reasonably: based on portfolio theory, if other conditions are constant, the smaller the correlation coefficient of different investment rates of return, the greater the ability of reducing the risk of overall investment portfolio. Therefore, in order to achieve the goal, it should spread investment risk, when making investment decisions must pay attention to the analysis of the correlation between investment projects. In the progress of securities investment, enterprises should purchase different securities to reduce the correlation coefficient of different industries. If the purchase of securities within the same industry, it should avoid all of the purchased securities from the same company.

Third is about funds recovery. (1) Choosing reasonable sales way and the payment method: for the customers with good financial and credit conditions, taking the way of sell on credit and to control the total credit amount within a line of credit, settlement is taken the instalment payment and commercial drafts when the less risky way of settlement. While, for those customers with poor credit condition, the solvency of customers should adopt the mode of the pin, taking corresponding methods of payment of exchanging,

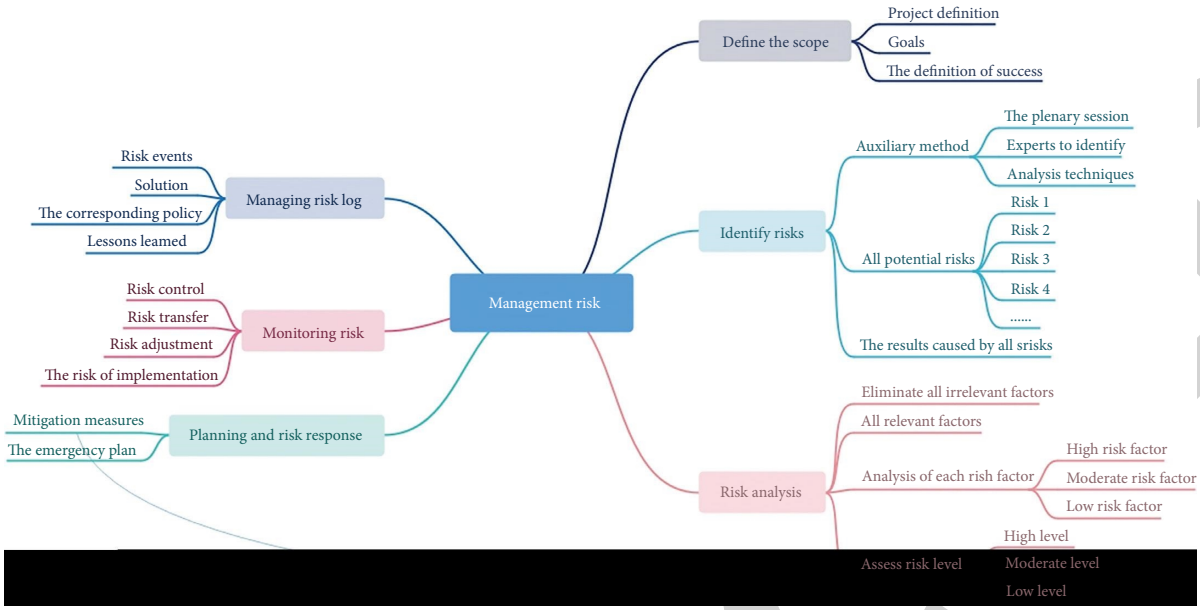

Figure 2: Diagram of enterprise risk management process diagram.

checking as far as possible. (2) Establishing the reasonable collection policy and collecting payment for goods timely: to customers overdue outstanding credit arrears, the enterprise should organize personnel to collection. (3) Establishing a system of bad debts reserves: The enterprise shall, in accordance with the principle of prudence, withdraw bad debt reserves for possible bad debt losses before they occur, so as to reduce the falsely increased profits in the current period and prevent the adverse effects of capital recovery risks.

Fourth is about distribution of income distribution. (1) Making reasonable income distribution policy: the income distribution policy of the company depends on the actual situation of the company profit. Co., LTD.; for example, if a company's surplus is stable, it can extend higher dividends; otherwise, it can only extend lower dividends. (2) Setting up enterprise good image and building investor confidence: income distribution policy, improper or frequent changes in income distribution policy may cause adverse effect to the enterprise. Enterprises should take measures to convey the positive beneficial information to investors actively. Particularly noteworthy is that enterprise cannot disclose false information to restore investor confidence. Otherwise, it will not only unfavorable to the promotion of enterprise value but also it will increase the EFR.

2.2. Multiobjective Optimization Theory. At present, the main classification of multiobjective optimization theory is (1) the optimization of unconstrained and constrained conditions; (2) the uncertainty and randomness of the optimal problem (variable); (3) the linear and nonlinear optimization (that is, the objective function and constraint conditions whether linear); and (4) static and dynamic planning whether changes over time (optimization).

Usually, the multiobjective optimization problem is composed of multiple objective function and some related equality and inequality constraints; mathematical expressions can be described as formulas (1) and (2):

$$\begin{cases} \min f_1(x_1, x_2, \ldots, x_n), \\ \vdots \\ \min f_r(x_1, x_2, \ldots, x_n), \\ \max f_{r+1}(x_1, x_2, \ldots, x_n), \\ \vdots \\ \max f_m(x_1, x_2, \ldots, x_n), \end{cases} \tag{1}$$

$$\begin{cases} g_i(x_1, x_2, \ldots, x_n) = 0, & i = 1, 2, \ldots p, \\ h_j(x_1, x_2, \ldots, x_n) > 0, & j = 1, 2, \ldots q, \\ x_k \in R, & k = 1, 2, \ldots n. \end{cases} \tag{2}$$

$f_1(x_1, x_2, \ldots, x_n), \cdots, f_m(x_1, x_2, \ldots, x_n)$ in formula (1) are called the m target functions, $x_1, x_2, \ldots, x_n$ are called the n variables, and g_i and h_j are equality and inequality constraint condition, respectively.

Combining formulas (1) and (2),

$$\begin{cases} \min \quad f(x) = [\, f_1(x) \;\; f_2(x) \;\; \cdots \;\; f_m(x) \,]^T \\ \qquad x \in X \quad X \in R^n \\ \text{s.t.} \quad g_i = 0 \quad i = 1, 2, \ldots, p \\ \qquad h_j = 0 \quad j = 1, 2, \ldots, q, \end{cases} \tag{3}$$

where min $f(x)$ is minimizing vector $f(x)$, i.e., the vector of the target function is as far as possible to minimization. $X \in R^n$ is a variable constraint set.

Multiobjective optimization problem is about letting multiple targets achieve the best possible condition in a certain range of area at the same time. The solution of multiobjective optimization is a set of equilibrium solution usually. Among them, the non inferior solution means that

there is no optimal solution for the multiobjective optimization problem, and all possible solutions are called non inferior solutions, also known as Pareto solutions. However, all of the possible solutions are known as the Pareto solutions. Usually, there is a mutual coupling relationship between multiple targets, may be a plenty of positive correlation, or a plenty of negative correlation (namely, a target optimization, another deterioration). So, in progress of solving multiobjective optimization problems, it needs to balance the goal of the relationship among the find the key goals.

Multiobjective optimization problems usually do not exist the only global optimal solution. In the process of multiobjective optimization, dominant (Pareto dominate) and the optimal (Pareto optimal) concepts are used widespread. Supposing two decision vectors a, $b \in X$, Pareto solution a is better than b, and $a > b$. According to formal (1), it can be described as follows:

$$\begin{cases} f_i(a) \le f_i(b), & i = 1, 2, \ldots, r, \\ f_i(a) > f_i(b), & i = r+1, r+2, \ldots, m. \end{cases} \tag{4}$$

At present, the main algorithms for solving the above multiobjective optimization problems are linear programming and genetic algorithm. Generally, the objective function is not as linear function, so in this paper, the important research multiobjective optimization genetic algorithm is used to solve the EFRM strategy optimization problem. The multiobjective genetic algorithm is used for analysis and an evolutionary algorithm is for solving the problem of multiobjective optimization; its core is to coordinate the relationship between each objective function and find out the optimal solution set that makes each objective function reach the larger (or smaller) function value as much as possible.

Genetic algorithm in solving multiobjective optimization problem has properties of fast convergence speed and can quickly solve multiobjective optimization problems of pareto solutions and so on. So, the genetic algorithm is used to solve the enterprise financial risk management multiobjective optimization strategy in this article. The genetic algorithm flow chart is as shown in Figure 3.

According to Figure 3, it shows that the process of application of the genetic algorithm (GA) to solve multiobjective optimization enterprise financial risk management strategy is as follows: (1) according to the characteristics and the scope of the independent variables to solve the model, set the target number, fitness, and the parameters such as number of iterations; (2) Set discrete variables according to population parameters; (3) set (2) in the generation of discrete variable parameters into the model of objective function to solve the calculation; (4) The parent population is updated, crossovered, and mutated to produce the next generation population. And repeat steps (1) ~ (3) until convergence, obtain the optimal solution, and exit the multiobjective optimization calculation.

2.3. EFRM Model. Based on the EFRM theory introduced in Section 2.1, EFRM mainly includes funds and employee management. The causes of EFR are excessive borrowing and failed to pay. It showed that the enterprise with moderate debt can enhance its market competitiveness from history experience and has a certain role in promoting enterprise's profit sustained growth ability. Therefore, it cannot simply take corporate debt index to assess the EFR, profitability, and management efficiency.

In order to evaluate EFR scientifically, it needs to set up a scientific and reasonable EFR evaluation model. By integrating a series of financial indicators such as an enterprise's solvency, profitability, and liquidity from different perspectives, we can comprehensively, systematically, and comprehensively analyze and evaluate the enterprise's financial status and operation, which will provide a certain basis for FR management decisions making. According to the actual values of the indexes of EFR, their own satisfaction value and not satisfied efficacy coefficient are calculated. Efficacy coefficient as the index value in the industry level reflects the risk degree of the EFR index in the industry. EFR indicators efficacy coefficient is expressed by the following formula:

$$y_i = \frac{x_i - x_{il}}{x_{ih} - x_{il}}, \tag{5}$$

where y_i is the ith risk indexes of efficacy coefficient; x_i is the ith a risk index actual value; x_{il} to the ith a risk index in the industry is not satisfied with value; x_{ih} is satisfaction value for the ith indicators of risk.

The overall financial risk level of the enterprise is evaluated by the efficiency coefficient of various financial risk indicators of the enterprise. It is assumed that 60 points is the pass line of the efficiency coefficient; formula (6) can be used to calculate the effect of each single index coefficient calculation of their respective index.

$$f_i = y_i \times 40 + 60. \tag{6}$$

The overall FR of the enterprise level evaluation as shown in the following formula:

$$\mathbf{Z} = \sum k_i f_i, \tag{7}$$

where $\mathbf{Z}$ is the EFR level; f_i according to the EFR characteristics determines the ith a risk index (objective function); K_i is the ith risk weights; it is determined by using the fuzzy hierarchy method.

By the clear enterprise risk index f_i, refer to the scale method (in Table 1), which is proposed by United States professor T. L. Saaty, build as shown in formula (8) of the judgment matrix:

$$\mathbf{A}_{m\times m} = \left(a_{ij}\right)_{m\times m} = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1m} \\ a_{21} & a_{22} & \cdots & a_{2m} \\ & & \ddots & \\ a_{m1} & a_{m2} & \cdots & a_{mm} \end{bmatrix}, \tag{8}$$

where a_{ij} is the ith index compared with the jth index of importance. The relationship between a_{ij} and a_{ji} is as shown in the following formula:

$$a_{ji} = \frac{1}{a_{ij}}. \tag{9}$$

For the index weight calculation, firstly the ith line element of the judgment matrix is multiplied, recorded as p_i:

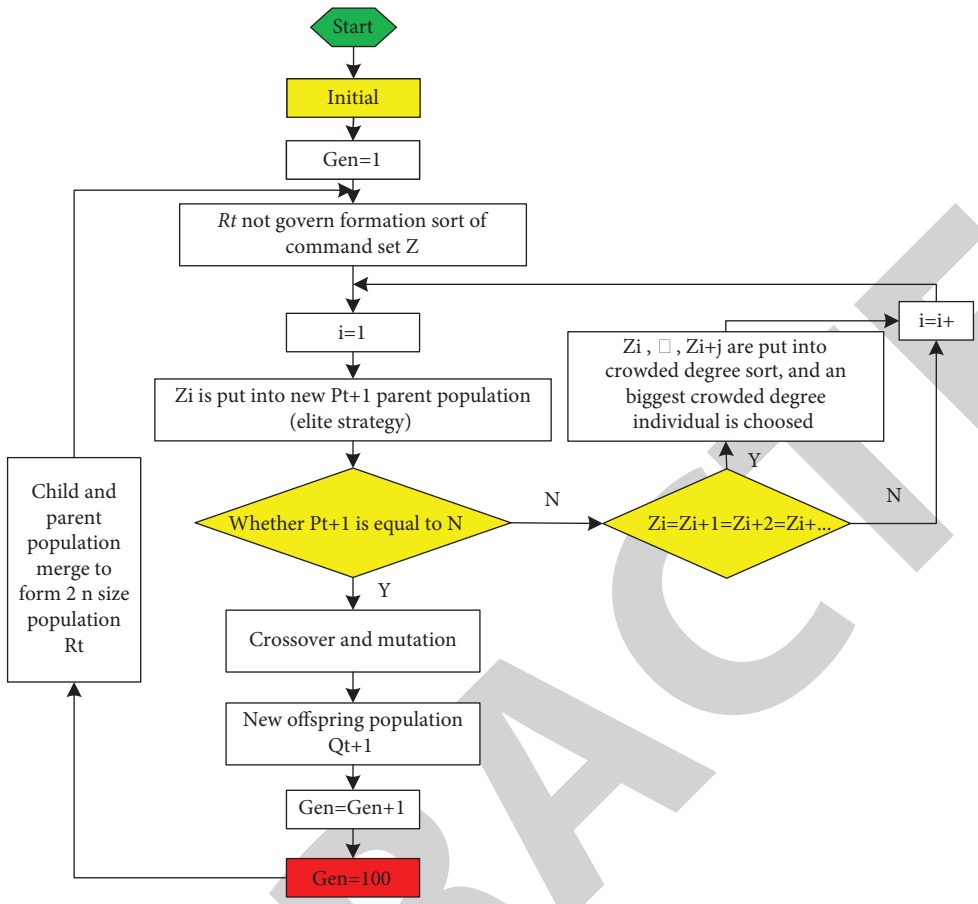

Figure 3: The flow chart of the genetic algorithm.

Table 1: The judgment matrix scale method.

Scale	Definition
1	Two factors are equally important
3	The ith index is slightly more important than the jth index
5	The ith index is more important than the jth index
7	The ith index is obviously more important than the jth index
9	The ith index is extremely more important than the jth index
2, 4, 6, 8	Between the two adjacent judgment values

$$p_i = \prod_{i=1}^{m} a_{ij}. \tag{10}$$

Secondly, find the m-th root k_{mi} of

$$k_{mi} = \sqrt[m]{p_i}. \tag{11}$$

Finally, the k_{mi} is normalized

$$k_i = \frac{k_{mi}}{\sum_{i=1}^{m} k_{mi}}. \tag{12}$$

Combination formulas (6)–(12) can be obtained by the enterprise's FR values; in combination with the multiobjective optimization algorithm as shown in Figure 3, calculation process can be obtained by the EFR strategy multiobjective optimization scheme.

3. EFRM Strategy Optimization Case Study

3.1. Introduction for Target Enterprise. The company was established 20 years before; it has developed into a given priority with the equipment manufacturing industry. Its business involves the engineering machinery, lifting machinery, coal mining equipment, industrial vehicles, hydraulic components, aviation equipment, military industrial machinery, and so on nearly ten several areas. The level of machine, electricity, liquid integration, and automation control technology of this company is in a leading stage. Robots, unmanned aerial vehicles, and high-end smelting equipment produced by the company are widely used for the company independent development of sensor, controller, and components. At present, the productions of the company have high performance and high-quality engineering

machinery, which enjoy high status in the industry. The staffs' number of the company is about 4000, and it is the top 100 global engineering machinery enterprises and the world's top 50 excavator enterprises.

3.2. An EFR Modeling. According to financial statement of the company in recent years, the main financial risk target indexes of the enterprise can be obtained. Based on Section 3.1, the four primary financial risk indexes of solvency, profitability, profit distribution, and financial management ability are used to evaluate the ability of EFRM. Solvency can be divided into cash flow ratio, asset-liability ratio, and the multiple of interest safeguard three secondary indicator. Profitability can be divided into the return on net assets, operating profit margin, surplus cash cover, and cost efficiency. Profit allocation can be divided into research and development of failure risk expenses, staff wage growth, performance reward ratio, and equity incentive ratio. Financial management ability can be divided into financial error ratio, financial personnel quality, and financial personnel in the proportion of members of the company.

The weight relationships among these main financial risk indexes and their comprehensive scores can be obtained by consulting the executives and financial personnel.

Among first-level indicators, in profitability, solvency is as important as the obvious important profits' allocation and is extremely important in the financial management ability. Profit distribution is very important from the financial management ability. As shown in Table 1, primary index important degree of judgment matrix $\boldsymbol{A}$ is as follows:

$$\mathbf{A} = \begin{bmatrix} 1 & 1 & 7 & 9 \\ 1 & 1 & 7 & 9 \\ \frac{1}{7} & \frac{1}{7} & 1 & 7 \\ \frac{1}{9} & \frac{1}{9} & \frac{1}{7} & 1 \end{bmatrix}. \tag{13}$$

Analytic hierarchy process (AHP) is an important tool of the system analysis method about taking the research object as a system, according to the decomposition, comparative judgment, comprehensive way of thinking, to make decisions, and be developed after mechanism analysis and statistical analysis. It has the characteristics such as concise and practical quantitative data and required less, very suitable for the multiobjective optimization model of enterprise financial risk management strategy, so the method used in this paper is to assess and solve the enterprise financial risk management strategy to multiobjective optimization problem.

According to Section 2.3, the analytic hierarchy process (AHP) is introduced to calculate the weights of the four primary financial risk indexes in this paper. They are 0.4314, 0.4314, 0.1044, and 0.0328, respectively, so the weight vector **a** can be recorded as follows:

$$\mathbf{a} = \begin{bmatrix} 0.4314 \\ 0.4314 \\ 0.1044 \\ 0.0328 \end{bmatrix}. \tag{14}$$

In each of the secondary level indicators, (1) The proportion of capital flow is more important than the asset liability ratio, and obviously more important than the interest cover ratio; asset liability ratio is more important than interest cover. (2) The return on net assets is slightly more important than the operating profit margin, more important than the surplus cash guarantee ratio, and significantly more important than the cost utilization ratio; the operating profit margin is more important than the surplus cash guarantee ratio and obviously more important than the cost utilization ratio; surplus cash cover ratio is more important than cost utilization ratio; (3) The R & D investment ratio is slightly more important than the employee salary growth rate, more important than the performance reward ratio, and significantly more important than the equity reward ratio; the wage growth rate of employees is more important than the performance reward ratio and significantly more important than the equity reward ratio; performance reward ratio is more important than equity reward ratio; (4) The proportion of financial errors is important to the quality of financial personnel and extremely important to the proportion of financial personnel in the company members.

The secondary index weight of each primary index can be obtained by using a similar method. They are $U_1 = [0.7306\ 0.1884\ 0.081]^T$, $U_2 = [0.5338\ 0.3101\ 0.1135\ 0.0426]^T$, $U_3 = [0.5338\ 0.3101\ 0.1135\ 0.0426]^T$, and $U_4 = [0.7219, 0.2271, 0.051]^T$, respectively. The weight of each secondary index can be calculated by the following formula:

$$k = a_i \times U_j, \quad i = 1, 2 \ldots, 4\ j = 1, 2, \ldots 4, \tag{15}$$

where a_i is the weight of the ith element in vector a and Uj is the index weight vector of the secondary indicators in the jth primary.

3.3. An EFRM Optimization. Based on the above introduction to a company's financial management system to select the solvency, profitability, profit distribution, and FRM ability of four primary financial risk indexes to evaluate a company's FRM ability, Figure 4 shows the four primary financial risk index scores of the enterprise in recent 5 years.

Figure 4 shows that the EFR of the enterprise have been constantly changing in the past five years. (1) affected by the outbreak of the new champions league in 2020, there is the sharp decline in profitability and solvency of enterprises, EFR; (2) In 2018, the company had the lowest financial management ability, which had a negative impact on the normal operation of the company. Later, the company increased its attention and investment in financial management ability and (3) in the process of enterprise operation, all kinds of risks are intertwined and resist risk together to all enterprises.

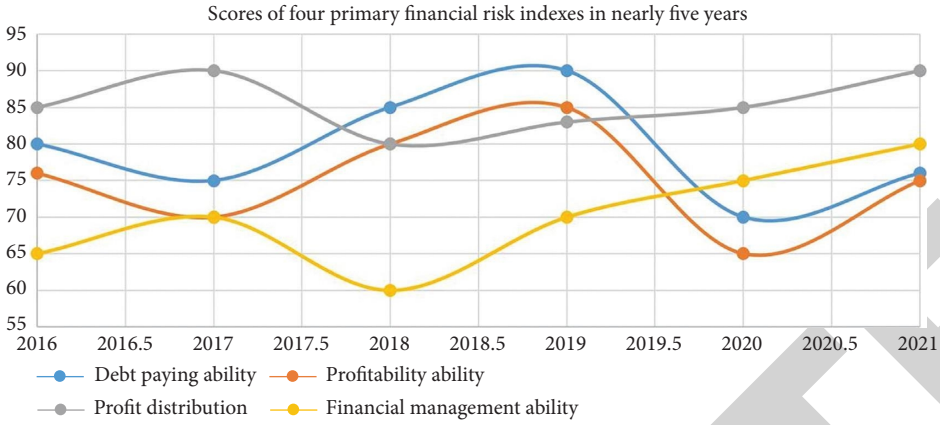

Figure 4: Scores of four primary financial risk indexes in nearly five years.

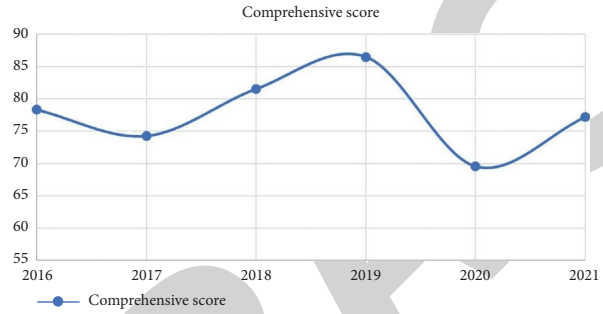

Figure 5: Nearly five years against financial risk score.

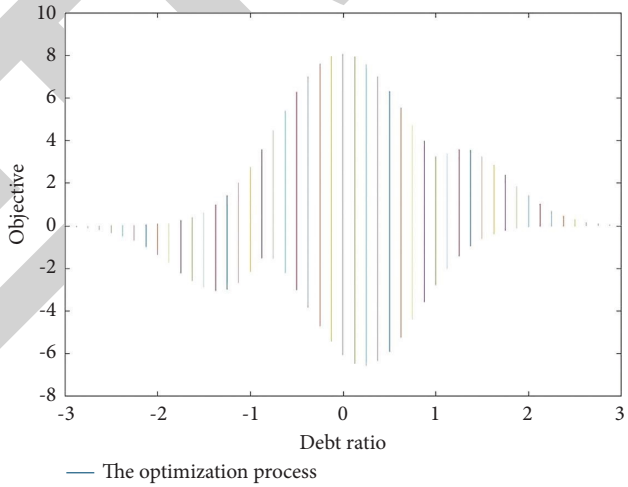

Figure 6: Relationship between debt ratio and the multiobjective optimization function.

Based on the above, the enterprise financial risk model and the enterprise financial risk assessment model are established, and the scores of the enterprise's ability to resist financial risks in recent 5 years are obtained according to formula (14), which is shown in Figure 5.

Figure 5 shows that (1) the enterprise to resist the ability of the financial risk is the outcome of combined action of various indicators of risk; (2) the enterprise's profit ability and debt paying ability to resist the ability of the financial risk of the enterprise had the greatest influence, thus affected by the outbreak of the new champions league in 2020, nearly 5 to the financial risk of the largest companies face; (3) enterprise financial management ability is the ability to resist financial risks to the enterprise minimal impact factor and is

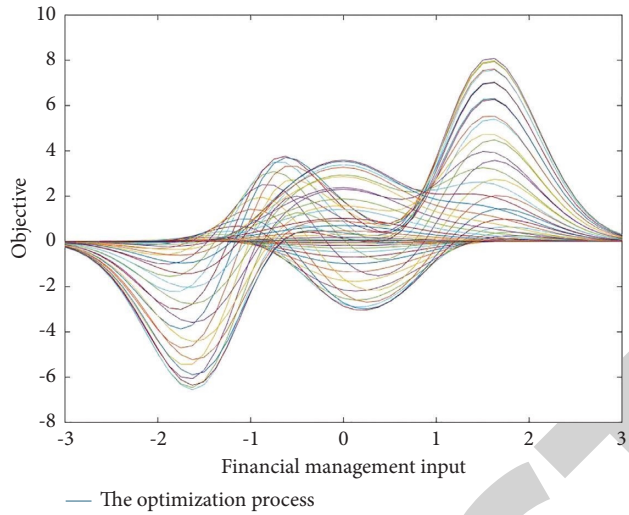

Figure 7: Relationship between financial management input and multiobjective optimization function.

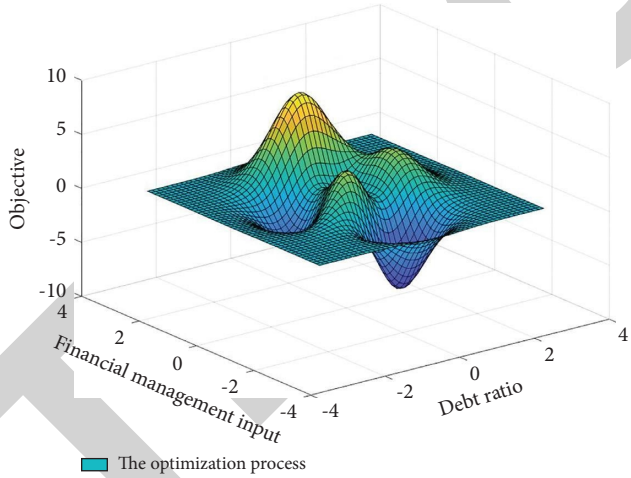

Figure 8: Relationship between bivariate joint and multiobjective function.

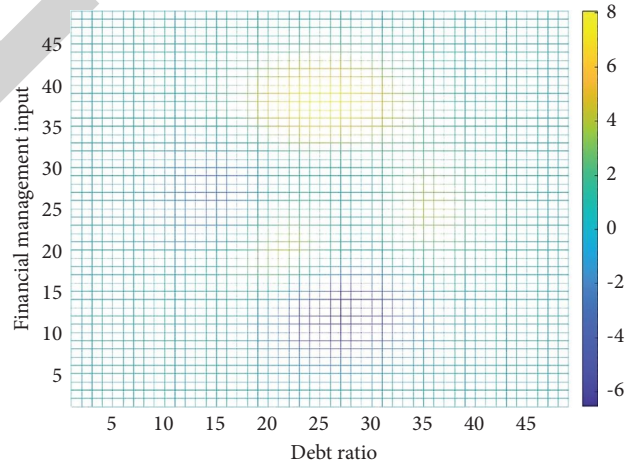

Figure 9: Multiobjective optimization results.

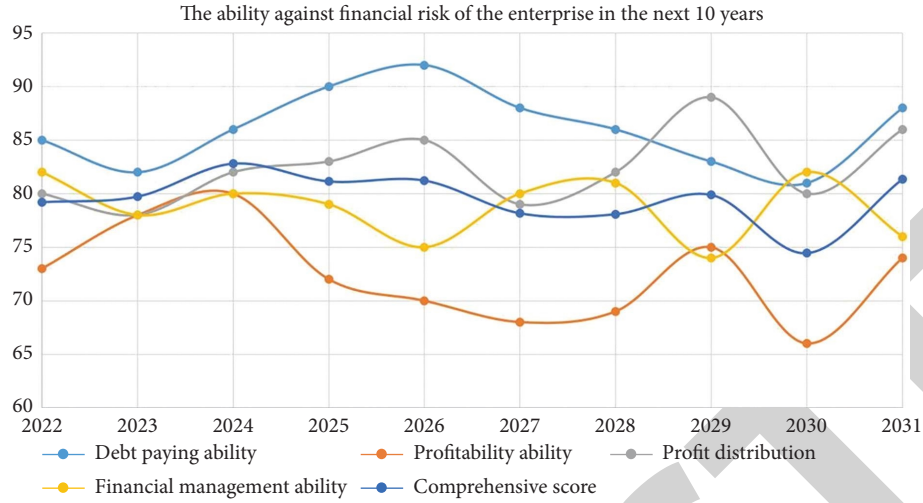

Figure 10: The ability against financial risk of the enterprise in the next 10 years.

often ignored by business leaders, but it is long to the enterprise that the whole operation plays an important role, and attention needs to be improved.

Figures 6–10 show the optimization process for multiobjective optimization of enterprise financial management based on the optimization algorithm shown in Figure 3.

Figure 6 shows the EFRM in the process of multiobjective optimization, debt ratio, and the relationship between the multiobjective optimization function. It shows that when the debt ratio exceeds 1, the multiobjective function value of the enterprise's financial risk gets a smaller value. At this time, the enterprise's ability to resist financial risk is weak. Therefore, such situations should be avoided in the process of enterprise operation.

Figure 7 shows the EFRM in the process of multiobjective optimization and the financial management of the relationship between the input and multiobjective optimization function.

Figure 8 shows the EFRM in the process of multiobjective optimization, selection of debt ratio and financial management into two variables, the two variables, and the relationship between the multiobjective optimization function.

Figure 9 shows that the enterprise's FRM multiobjective optimization is to find a local optimum, increase investment in certain aspects of the part that can make the target index improved, and some deterioration; this requires us to have the vision of EFRM. According to the conclusion in Figure 9, a local optimization node optimizes the enterprise financial management; the optimized enterprise ability to resist financial risk score to predict the future 10 years is shown in Figure 10.

Figure 10 shows the optimized process for the EFRM, to predict the ability of the enterprise to resist financial risks in the next 10 years.

4. Conclusions

Research materials about EFRM are summarized; the development research history, status, and the current research hot spots about the EFRM are combed in this paper. According to the characteristics of EFRM, the multiobjective optimization method is selected to solve the difficult and hot issue of EFRM. A multiobjective optimization model of EFRM is studied and established, and the intelligent algorithm is used to solve the multiobjective optimization problem. Finally, a company is taken as a research object, and the theory of the research achievements of the EFRM is adopted to optimize the multiobjective optimization model. In order to improve competitive ability of the enterprise market to against financial risk, it provided several suggestions. And if enterprises adopt these suggestions, the EFR of the company will reduce in a certain level in the next 10 years. Therefore, the researching results show that these suggestions to the enterprise play a very important and positive role to improve ability to resist financial risk. The theory and method studied in this paper can provide a theoretical guidance to improve the ability of companies to resist financial risks.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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