Portfolio Algorithm Based on Accounting Information System Relevance

SuJuan Zhou
Yunnan College of Business Management, KunMing, 650000, China

Keywords: Combinatorial Algorithm, Investment Decisions, Accounting Information Management, Single Investment, Invest More, Comprehensive Investment, Combination Rate, Relevance, Decision Accuracy.

Abstract: Accounting information management plays a crucial role in investment decision-making, but there is a problem of inaccurate evaluation. The proportional estimation method cannot solve the accounting information management problem in investment decision-making, and the decision-making plan is unreasonable. Therefore, this article proposes a combination algorithm for investment risk accounting information management analysis. Firstly, a combination of indicators is used to make decisions on comprehensive investments, and indicators are divided according to accounting information management requirements to reduce interference factors in accounting information management. Then, comprehensive indicators are used to analyze investment risk accounting information, form an accounting information management plan, and comprehensively analyze the results of accounting information management. The accuracy of investment decision shows that under the condition that the decision analysis indicators are fixed, the accuracy of the combination algorithm for accounting information management analysis of various investment risks and the analysis time of accounting information management are better than the proportional estimation method.

1 INTRODUCTION

The portfolio ratio is one of the important contents of investment decision-making (Alsubaei, 2023), which is of great significance for the accuracy of decision-making (Bratfisch, Riar, et al. 2023). However, in the process of accounting information management, there is a problem of poor accuracy in accounting information management plans (Cola, Mazza, et al. 2023), which affects the return on various investments. Some scholars believe that applying portfolio algorithm to investment decision analysis can effectively analyze accounting information management schemes and provide corresponding support for accounting information management (Dalloul, Ibrahim, et al. 2023). On this basis, this article proposes a combination algorithm to optimize accounting information management schemes and verify the effectiveness of the algorithm (De, Ferreira, et al. 2023).

1.1 Portfolio Algorithm for Accounting Information Systems

The portfolio algorithm of the Accounting Information System (AIS) is a mathematical method that helps investors choose and balance their portfolios. It helps people minimize risk and ensure maximum returns by diversifying their portfolios (Ferreira, Slavov, et al. 2023). In the portfolio algorithm, there are three main components: asset allocation, asset allocation, and asset restructuring (Fredo, Motta, et al. 2023).

1.1.1 Asset Allocation

Asset allocation refers to the allocation of assets in a portfolio to different asset classes to maximize returns and minimize risk (Gyamera, Atuilik, et al. 2023). Generally, asset classes include cash, bonds, stocks, and real estate, among others. When allocating assets, factors such as liquidity, risk, and return of assets need to be considered (Hnatchuk, Hovorushchenko, et al. 2023).

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1.1.2 Asset Allocation

Asset allocation refers to the spread of assets in a portfolio across different securities to diversify risk and ensure maximum returns. Generally, security options include stocks, bonds, and derivatives, among others. In the process of asset allocation, investors need to consider factors such as the risk level, return expectations, liquidity and correlation of each security (Hoelscher, and Shonhiwa, 2023).

1.1.3 Asset Restructuring

Asset restructuring refers to the re-evaluation of asset allocation and asset allocation strategies over a period of time to ensure that a portfolio always has the best level of return and risk. Investors need to adjust their asset allocation and asset allocation strategies at any time to adapt to market changes and their own investment goals (Jarah, Zaqeeba, et al. 2023).

1.2 Analysis of the Advantages and Disadvantages of Portfolio Algorithms

1.2.1 Advantages

(1) Risk reduction – Portfolio algorithms can guarantee investment returns by diversifying assets across different securities to minimize portfolio risk (Kao, Yuan, et al. 2023).

(2) Optimize returns – Portfolio algorithms can optimize portfolio returns by selecting high-yield, low-risk securities.

(3) Adapt to market changes – The portfolio algorithm can adjust asset allocation and asset allocation strategies at any time when the market changes to adapt to market changes.

(4) Improve investment efficiency – Portfolio algorithms can help investors use funds more efficiently and improve investment efficiency (Lamberton, Raschke, et al. 2023).

1.2.2 Disadvantages

(1) Rely on historical data – Portfolio algorithms need to rely on historical data to predict future market movements, which may lead to inaccurate algorithm predictions (Loureiro, Milligan, et al. 2023).

(2) High algorithm complexity – The implementation of the portfolio algorithm requires the use of complex mathematical models and algorithms, which may lead to investment failure if not implemented correctly (Lukas, 2023).

(3) Human interference – Portfolio algorithms need to artificially formulate asset allocation and asset allocation strategies, and if investors' decisions are irrational, it may affect the effectiveness of the algorithm (Minbaleev, Berestnev, 2023).

(4) High capital threshold – Portfolio algorithms require a large investment of capital in order to achieve the best investment results, which may make it difficult for small-scale investors to use the algorithm (Mokhnacheva, 2023).

Portfolio algorithm is an effective investment strategy that can reduce the risk of a portfolio to a certain extent, improve investment returns and efficiency (Poppe, Vrolijk, 2023). However, despite the many advantages of portfolio algorithms, there are still some limitations and disadvantages. Therefore, investors should fully understand the characteristics and limitations of the portfolio algorithm, and use the algorithm appropriately when formulating investment strategies, pay attention to the uncertainty of the algorithm's predictions, and adopt appropriate risk management strategies to ensure the success of the portfolio (Qadri, Altass, 2023).

1.3 Optimization Indicators of Accounting Information Systems

In order to assess the operation of accounting information systems, it is necessary to consider the indicators of the system in a comprehensive manner. The following is an analysis of the relevant indicators of the accounting information system (Qatawneh, 2023).

1.3.1 Efficiency Indicators

Data processing speed is one of the main indicators to measure the efficiency of accounting information systems. An efficient system should be able to process large amounts of data quickly in a short period of time to ensure fast response and response time. Therefore, enterprises should continuously optimize hardware equipment and software systems to improve data processing speed.

Application response time is also an important indicator of the efficiency of accounting information systems. An efficient system should respond to a user's request within 6 seconds, and this data is often used as a reference value that can help enterprises evaluate the responsiveness of the system. Fast response times can improve user satisfaction and bring higher revenue to the business.

1.3.2 Task Completion Time

Task completion time is another important indicator to measure the efficiency of accounting information systems. An efficient system should be able to complete data processing tasks in a short time and provide timely results to users. Therefore, enterprises should monitor the efficiency of system operation by setting a reasonable task completion time, and continuously optimize the system to improve efficiency.

1.3.3 Security Metrics

Data confidentiality is one of the important indicators to measure the security of accounting information systems. A highly secure system should be able to keep your organization's data safe from unauthorized access and theft. Therefore, enterprises should take appropriate measures, such as access control, encryption technology, data backup, etc., to ensure the confidentiality of data.

1.3.4 System Reliability

System reliability is another measure of the security of accounting information systems. A highly reliable system should guarantee system stability and prevent system failure and data loss. Therefore, enterprises should take appropriate measures, such as backup systems, integrity verification, disaster recovery plans, etc., to ensure the reliability of the system.

1.3.5 Quality Indicators

Data accuracy is one of the main indicators to measure the quality of accounting information systems. Data accuracy is directly related to the correctness of business decisions, therefore, enterprises should take appropriate measures, such as data validation, data cleaning, etc., to ensure the accuracy of data. Data integrity is also one of the indicators to measure the quality of accounting information systems. Enterprises should ensure the integrity of data to guarantee the correctness and integrity of data. Data integrity can be achieved by employing measures such as data validation and data backup.

1.3.6 User Satisfaction Metrics

User satisfaction is a key indicator to measure the satisfaction of accounting information systems. Through user surveys and feedback, enterprises can understand the user's satisfaction with the system to understand the advantages and disadvantages of the system and further improve the system.

The user learning curve is also one of the indicators to measure the satisfaction of accounting information systems. Enterprises should provide system interfaces and functions that are easy to learn and use to help users quickly master the system and improve work efficiency.

1.3.7 Cost Indicators

The overall development cost is one of the main indicators to measure the cost of accounting information systems. Companies should make a reasonable budget before system development and control system development costs to maximize benefits.

Maintenance and operating costs are another measure of the cost of accounting information systems. Enterprises should control the operation and maintenance costs of the system to ensure that the system can operate stably for a long time and minimize costs.

The above indicators can help enterprises understand the operating status of the system and continuously optimize the system to improve efficiency and reduce costs. Enterprises should choose and value these indicators according to their actual situation to help enterprises make better strategic decisions.

2 RELATED CONCEPTS

2.1 Mathematical Description of Combinatorial Algorithms

The combination algorithm utilizes correlation to optimize accounting information management plans, and based on various indicators in accounting information management, discovers unqualified values in investment decisions, integrates accounting information management plans, and ultimately determines the feasibility of investment decisions. The combination algorithm combines the advantages of correlation to quantify investment decisions, which can improve the direction of accounting information management investment decisions.

Assumption I. Accounting Information Management Requirements is c_i, The accounting information management plan is $\lim$, The combination rate of accounting information management solutions is w, The judgment function

of accounting information management plan is $U(g>0)$,As shown in formula (1)。

$$FV\lim_{x\to\infty}=\sum_{i=1}^{n}(c_i-w)^2\bigcup_{i=1}^{n}g\cos^{-1}\theta_i \quad (1)$$

2.2 Selection of Investment Decision Direction Plans

Assumption II The investment decision function is $g(x_i)$, The weight coefficient is l , So, there are unqualified investment decisions in accounting information management, as shown in formula (2):

$$\sum_{i=1}^{n}(g_i-l)^2\approx g_1,\ldots,g_n\sum_{i=1}^{n}g_i l\bigcup_{i=1}^{n}X_i l_i \quad (2)$$

2.3 Analysis of Accounting Information Management Plan

Before conducting a combination algorithm, it is necessary to conduct a multidimensional analysis of the accounting information management plan and map the accounting information management requirements to the investment decision database, eliminating unqualified accounting information management plans. Conduct a comprehensive analysis of investment decisions and set thresholds and indicator weights for accounting information management plans to ensure the accuracy of the combination algorithm. The investment decision is a system testing accounting information management plan that requires correlation analysis. If the investment decision is in a non normal distribution, its accounting information management plan will be affected, reducing the accuracy of the overall accounting information management. In order to improve the accuracy of the combination algorithm and improve the level of accounting information management, it is necessary to select accounting information management schemes, and the specific scheme selection is shown in Figure 1.

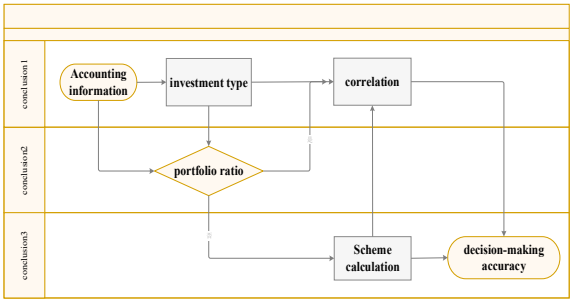

Figure 1: Selection Results of Investment Decision Direction Schemes

The investigation of the accounting information management plan shows that the investment decision-making direction plan presents a multidimensional graph distribution, which is in line with objective facts. Investment decisions have no directionality, indicating that the investment decision direction scheme has strong randomness, so it is considered as a higher level of analytical research. Investment decisions comply with normal requirements, mainly by adjusting investment decisions based on correlation, removing duplicate and irrelevant plans, and supplementing default plans, making the dynamic correlation of the entire accounting information management plan strong.

3 OPTIMIZATION STRATEGIES FOR INVESTMENT DECISIONS

The combination algorithm adopts a combination correlation optimization strategy for investment decisions and adjusts comprehensive investment parameters to achieve optimization of investment decisions. The combination algorithm divides investment decisions into different levels of accounting information management and randomly selects different plans. During the iteration process, optimize and analyze accounting information management plans at different levels of accounting information management. After the optimization analysis is completed, compare the accounting information management levels of different schemes and record the best investment decisions.

4 PRACTICAL CASES OF INVESTMENT DECISIONS

4.1 Introduction to Accounting Information Management

In order to facilitate accounting information management, this article focuses on investment decisions in complex situations, with 3 categories and a testing period of 1 year. The specific accounting information management plan for investment decisions is shown in Table 1.

Table 1: Requirements for Accounting Information Management in Universities

Category	Level	Portfolio Ratio	Correlation
Single Investment	I	63.65%	93.07%
	II	54.28%	84.65%
Multiple Investments	I	63.23%	94.47%
	II	59.87%	85.16%
Comprehensive Investments	I	65.61%	94.67%
	II	53.82%	82.79%

The accounting information management process in Table 1. is shown in Figure 2.

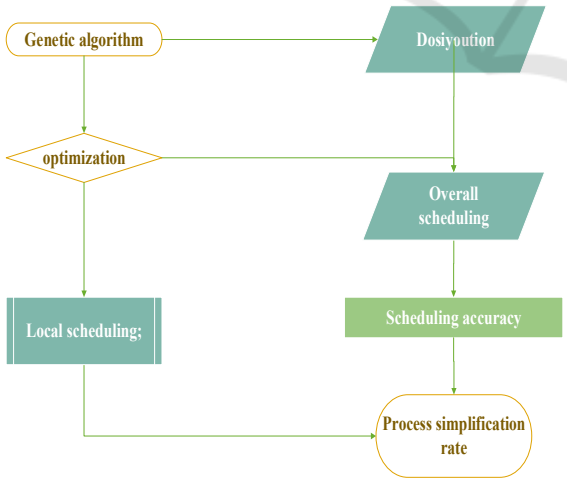

Figure 2: Analysis Process of Investment Decision

Compared with the proportional estimation method, the accounting information management scheme of the combination algorithm is closer to the actual accounting information management requirements. In terms of rationality and volatility of investment decisions, combination algorithms and proportional estimation methods are used. From the changes in the accounting information management scheme in Figure 2, it can be seen that the combination algorithm has higher decision-making accuracy. Therefore, the combination rate of accounting information management solutions based on the combination algorithm is more optimized and the correlation is more reasonable.

4.2 Investment Decision-Making Situation

The accounting information management plan for investment decisions includes unstructured information, semi structured information, and structured information. After preselection of the combination algorithm (Rosmawati, Apandi 2023), a preliminary accounting information management plan for investment decisions was obtained, and the feasibility of the accounting information management plan for investment decisions was analyzed. In order to more accurately verify the innovation effect of investment decisions, investment decisions with different levels of accounting information management were selected, and the accounting information management plan is shown in Table 2.

Table 2: Overall Situation of Investment Decision Direction Plan

Category	Risk Rate	Return Rate
Single Investment	74.75%	76.05%
Multiple Investments	73.62%	75.86%
Comprehensive Investments	73.54%	76.49%
Mean	76.17%	74.74%
X	74.20%	75.78%
P=75.01%		

4.3 Investment Decision Direction and Stability of Accounting Information Management

To verify the accuracy of the combination algorithm, the accounting information management scheme was compared with the proportional estimation method, as shown in Figure 3.

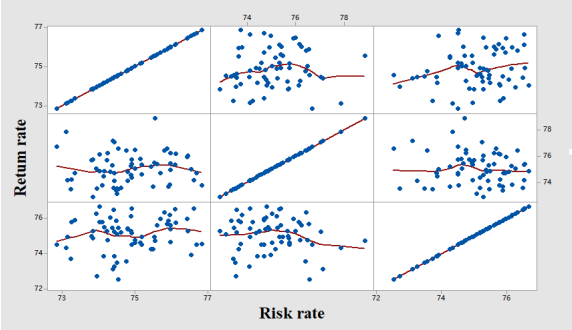

Figure 3: Investment Decision Directions for Different Algorithms

As shown in Figure 3, the investment decision-making direction of the combination algorithm is higher than that of the proportional estimation method, but the error rate is lower, indicating that the accounting information management of the combination algorithm is relatively stable, while the accounting information management of the proportional estimation method is uneven. The average accounting information management scheme for the above three algorithms is shown in Table 3.

Table 3: Comparison of Accounting Information Management Accuracy by Different Methods

Method	Combination	Correlation	Decision
Combinatorial	97.31%	97.73%	95.98%
Proportion Ales P	98.11%	98.08%	95.49%
	97.93%	97.52%	95.55%

It can be seen from Table 3. that in terms of investment decision-making, the proportional estimation method has shortcomings in investment decision-making direction and combinatorial optimization, and investment decision-making has undergone significant changes with a high error rate. The general result of the combination algorithm has a higher accuracy rate in investment decision-making direction, which is superior to the proportional estimation method. At the same time, the accuracy of the investment decision direction of the combination algorithm is greater than 90%, and there has been no significant change in accuracy. To further verify the superiority of the combination algorithm. To further validate the effectiveness of the proposed method in this article, different methods were used for general analysis of the combined algorithm, as shown in Figure 4.

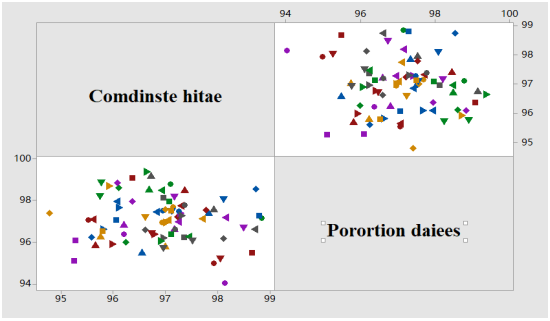

Figure 4: Investment Decision Direction of Combination Algorithm Accounting Information Management

From Figure 4., it can be seen that the investment decision direction of the combination algorithm is significantly superior to the proportional estimation method. The reason for this is that the combination algorithm increases the investment decision adjustment coefficient and sets a threshold for comprehensive investment, eliminating accounting information management schemes that do not meet the requirements.

5 CONCLUSIONS

In response to the problem of unsatisfactory investment decision-making direction, this article proposes a combination algorithm and optimizes investment decisions by combining the correlation of combination rates. At the same time, conduct in-depth analysis on innovation in accounting information management and threshold innovation, and construct a comprehensive investment portfolio. Research has shown that combination algorithms can improve the accuracy and stability of investment decisions and can be used for general accounting information management of investment decisions. However, in the process of combining algorithms, excessive emphasis is placed on the analysis of accounting information management, resulting in unreasonable selection of accounting information management indicators.

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