

Research on the Risk of Material Misstatement in M&A Audit under Fuzzy Comprehensive Evaluation

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Abstract:

With the development of economy, the demand for merger and acquisition of enterprises is increasingly strong, but there are many risks in merger and acquisition that make the process of merger and acquisition not smooth. This paper focuses on the quantification of audit risk, the main difficulties lie in the assessment of audit risk factors, the selection of audit risk factors, the weight distribution of factors and so on. This paper introduces the fuzzy comprehensive evaluation method and takes W Group's merger and acquisition of K enterprise as an example to illustrate the application of this method. The case involved complex accounting measures, unique corporate cultures, and the legal implications of unprecedented policy challenges, factors that made audit risk particularly prominent in the M&A process compared to other companies. The research results show that the risk of material misstatement in M&A audit for W Group's merger and acquisition of K company is medium and high risk, and indicates that the risk assessment model of material misstatement in M&A audit based on fuzzy comprehensive evaluation method can identify and quantify various risk factors more accurately, and provide a powerful decision support tool for auditors. At the same time, the model also has strong flexibility and adaptability, and can be adjusted and optimized according to the characteristics of different M&A cases.

Keywords: risk of material misstatement; fuzzy comprehensive evaluation; merger and acquisition audit; risk prevention; audit risk

INTRODUCTION

Different from the general financial statement audit, merger and acquisition audit has been studied by many scholars. M&A has become an important means to optimize resource allocation, increase market share and enhance enterprise value [1]. However, the risk of material misstatement in mergers and acquisitions has been a major concern for companies, investors and regulators. Therefore, it is of great practical significance and theoretical value to study the risk of material misstatement in M&A audit [2]. In M&A audit, auditors are faced with many challenges due to the complexity and dynamic nature of M&A process. Merger and acquisition transactions may involve complex interest relationships, the parties to the transaction may have asymmetric information, hidden related party relations and other problems, which may lead to the risk of material misstatement in merger and acquisition transactions [3]. At the same time, the valuation of M&A transactions is also an important factor leading to the risk of material misstatement [4]. In M&A transactions, the valuation of the target enterprise often involves a lot of subjective judgment and prediction, which makes the valuation more uncertain and increases the risk of material misstatement [5]. To address these challenges, auditors need to adopt a more scientific, systematic and comprehensive approach to assessing and addressing the risk of material misstatement in M&A audits [6]. Fuzzy comprehensive evaluation method is a method based on fuzzy mathematics, which can evaluate objectively and scientifically the risks that are fuzzy and difficult to quantify [7]. Therefore, it has great potential to apply the fuzzy comprehensive evaluation method to the risk assessment of material misstatement in M&A audit [8].

Combined with relevant literature at home and abroad, the study on the risk of M&A audit is not very in-depth. As we all know, risk is an extremely unstable factor. In general, the study on risk is from the perspective of loss or not [9]. The study of audit risk of M&A can be divided into two categories: one is the source of audit risk of M&A, and the other is how to prevent and control the risk of M&A [10].

From the perspective of audit risk sources of M&A, M&A audit should provide investors and other stakeholders with reliable financial information to enable them to make wise investment decisions [11]. In view of the financial status of the acquired company, the audit of merger and acquisition should not be limited to simple financial data, but should design a special audit process for the acquired company, so as to obtain the actual value of the acquired company [12].

As for the study on how to prevent and control the risks of mergers and acquisitions, Seidel and Abubakar pointed out that auditors should first assess the risk of the audited entity after the audit work, reasonably assess the possibility of material misstatement risk, and fully consider the results of risk assessment in subsequent audit work, and design more targeted audit

procedures to complete the audit work. Chan points out that if accounting firms want to find the problems in audit work as early as possible and reduce audit risks, they must have a detailed assessment of the audited entity and its environment before audit, so as to control audit risks as much as possible [13]. According to Sani and Abubakar, when conducting M&A audit, auditors need to use an analysis system to determine the specific situation of the audited entity and grasp the risks of M&A audit as a whole [14]. Thorsten sorted out the relationship between M&A risk and transaction price, and pointed out that business valuation methods provide guidance for the maximum price of M&A transactions, while risk management tools and business valuation techniques are conducive to decision-making and improvement of corporate performance [15]. At the same time, the acquirer's uncertainty about the characteristics and valuation of the target company may have a negative impact on shareholder value [16]. Alnefaie finds through empirical research that if the acquirer fails to fulfill its performance commitment, the possibility and amount of goodwill impairment will increase significantly. Bhagwan proposed that if the acquiree successfully performs its commitments, especially through earnings management, the likelihood of goodwill impairment after the commitment period increases; Timely recognition of goodwill impairment of unfulfilled commitments can reduce the risk of future stock price crashes. Scholars found through the investigation and research of multiple samples that auditors, as a neutral third party, can provide independent audit reports for M&A transactions, evaluate and report on the financial status, risks and future prospects of the acquired company [17]. This information can help the buyer better understand the situation of the acquired company and provide support for the buyer to develop a better transaction strategy. Through electronic questionnaire that there are many reasons for the failure of M&A [18]. Therefore, when conducting M&A, audit institutions and accounting firms should focus on factors affecting the failure of M&A, such as the selection of target enterprises, evaluation methods, payment methods, and post-merger restructuring plans. If all parties to a merger choose to share audit, it can improve the level of information disclosure of enterprises and reduce the asymmetry between enterprises, which is conducive to the smooth progress of the merger [19]. Multi-party information utilization and exchange in M&A can achieve maximum integration and improve the efficiency of M&A.

In the existing research, scholars mainly focus on the principle of fuzzy comprehensive evaluation, implementation steps and application in M&A audit. They believe that the fuzzy comprehensive evaluation method can comprehensively consider the influence of various risk factors, and provide a more accurate and comprehensive method to evaluate the risk of major error [20]. By building an appropriate model, we can analyze the weight and calculate the membership degree of the risk factors in M&A audit, so as to determine the influence degree of each factor on the risk. Most literatures start from the perspective of defining merger and acquisition audit as a special audit type, and focus on the complexity of merger and acquisition audit, instead of analyzing the particularity of merger and acquisition audit from the perspective of basic theory [21]. In other words, the current research in this area still lacks a unified and clear definition category and research framework. In addition, some scholars have discussed the limitations and improvement methods of fuzzy comprehensive evaluation [22]. They pointed out that the fuzzy comprehensive evaluation method still has some problems of subjectivity and high data requirements [23]. In order to overcome these limitations, the scholars recommend the use of more data sources and indicators, and the strengthening of integration with other audit techniques and methods to improve the accuracy and reliability of the assessment [24]. In addition, the empirical research on the risk of material misstatement in M&A auditing is still lacking [25]. Although some literatures have conducted a preliminary empirical analysis of M&A audit risks through case studies or questionnaires, these studies are often limited to specific regions or industries and lack in-depth research on M&A audit risks in a wider scope [26]. Finally, the existing literature has not fully discussed how to integrate these control measures into a unified framework to prevent and control the risk of material misstatement in M&A audit more comprehensively [27].

The rest of our work schedule is as follows. In Section 2, we summarize the advantages of applying the fuzzy comprehensive evaluation method to the risk assessment of material misstatement in M&A audit. In Section 3, we begin building the model. Examples are substituted into the constructed model and experimental results are provided in Section 4. Finally, Section 5 gives a conclusion.

ADVANTAGES OF FUZZY COMPREHENSIVE EVALUATION METHOD IN RISK ASSESSMENT OF MATERIAL MISSTATEMENT IN M&A AUDIT

The Fuzzy Comprehensive Evaluation Method, rooted in fuzzy mathematics proposed by L.A. (or I.A.) Zadeh in 1965, is designed to address comprehensive evaluations of objects influenced by multiple fuzzy factors. It treats the evaluated object as a fuzzy set of various factors and calculates the membership degrees of each factor to different remark levels, forming an evaluation matrix. Weight determination, crucial in this method, can be subjective, objective, or a combination of both. By synthesizing the fuzzy matrix with determined weights and membership degrees, the method converts qualitative evaluations into quantitative ones, effectively reflecting evaluation grades and rationalizing evaluation methods. Despite potential limitations, such as information loss and lack of intuitiveness in specific numerical values, the Fuzzy Comprehensive Evaluation

Method has been widely applied in various fields, demonstrating its unique advantages in handling complex, fuzzy, and subjective evaluation issues. Its main advantages are as follows:

Quantifying Factors that are not Quantitative

Fuzzy comprehensive evaluation method uses the basis of fuzzy mathematics to realize the transformation from qualitative to quantitative. In reality, there are many evaluation objects with fuzzy boundaries, which cannot get exact data and are difficult to be represented by a number. Fuzzy comprehensive evaluation solves this point. Based on fuzzy mathematics, it quantifies difficult indicators, makes it easier to compare, and timely finds various problems existing in enterprises to achieve high-quality and efficient operation. The main features of this method are: first, the use of comparative methods. General mathematical methods usually rely on a certain formula or index, if the index relied on is unreasonable, it may get unreasonable results. The fuzzy comprehensive evaluation method uses the method of comparison, which avoids the result error caused by the unreasonable index in the traditional method. Second, the weight selection of evaluation indicators is not completely uniform, but it does not affect the evaluation results, and can reduce the cumulative error. Third, select operators and determine membership function relations. In fuzzy evaluation, the corresponding relations should be established among various factors as indicators, so that the evaluation results can effectively reflect the overall correlation trend among indicators.

Make the Evaluation Scientific, Comprehensive and Objective

According to the actual situation of the enterprise and the fuzzy evaluation theory, the expert scoring method or analytic hierarchy process can be used to set the different weight levels of the factors. The weight setting process of fuzzy comprehensive evaluation method reflects the influence degree of a certain factor on the evaluation object, weighs all the evaluation indicators that have an impact on the audited entity, and obtains more objective and reasonable results.

The main difficulties we face in the process of fuzzy comprehensive evaluation of material misstatement risk in M&A audit are as follows: a variety of complex phenomena, a variety of risk factors and their interaction, a large number of fuzzy concepts, fuzzy phenomena. In the risk assessment methods of material misstatement, the traditional audit generally adopts the weighted average method of indicators, which is not detailed and clear. In this paper, the fuzzy comprehensive evaluation method is applied to the evaluation process of material misstatement risk. After describing the qualitative problems in risk assessment with scientific quantitative methods, the evaluation results are simplified into the qualitative representation of evaluation grades and various evaluation indicators, and the combination of qualitative and quantitative analysis is realized, which overcomes the subjective arbitrariness of traditional risk assessment methods of audit material misstatement, and can realize the scientific, comprehensive and objective evaluation.

Help Auditors Find the Root Cause of Risks

In the actual M&A audit work, auditors will use various methods to identify risks. There are many relatively easy methods, but they cannot assess the degree of risk, so they tend to pay insufficient attention to high-risk factors, that is, the root cause of the risk of material misstatement in M&A audit cannot be found. The fuzzy comprehensive evaluation method solves this problem well. The word method is operable and can determine the risk degree of various indicators, so that auditors can pay attention to the existing high risk factors for analysis, so as to find the root cause of risk and take effective countermeasures in time.

CONSTRUCTION OF RISK ASSESSMENT MODEL FOR MATERIAL MISSTATEMENT IN M&A AUDIT

Determine the Factor Theory Domain of the Evaluation Object

First of all, we must select evaluation indicators. The selection of evaluation indicators should consider the characteristics of the industry in which the enterprise is located, as well as the characteristics of the enterprise itself, combined with the particularity of merger and acquisition risk, and select the appropriate indicators after expert discussion. A evaluation index is selected, and the evaluation factor set $A = \{A_1, A_2, \dots, A_m\}$. Each indicator A_i contains a series of sub-indicators, $A_i = \{A_{i1}, A_{i2}, \dots, A_{in}\}$.

Establish the Evaluation Set and Determine the Weight Set

Evaluation set is a set composed of the results of the evaluation of the indicators by the evaluator. According to the need, the evaluation result is divided into several different dimensions, and the evaluation set $V = (V_1, V_2, \dots, V_n)$.

Each indicator has more or less impact on the risk to be measured, but the impact is very different, so it is necessary to assign different weights to different indicators to measure the impact of object risk. The weight of the evaluation factor set A is $W = \{W_1, W_2, \dots, W_n\}$, the weight set of the sub-indicators under each indicator is $W_i = \{W_{i1}, W_{i2}, \dots, W_{in}\}$.

Establishing Fuzzy Matrix

A set of factors is constructed, each factor A_i is quantified, and a fuzzy relation matrix is obtained after quantification:

$$R = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ r_{m2} & r_{m3} & \cdots & r_{mn} \end{bmatrix} \quad (1)$$

Among them, r_{mn} of matrix R represents the membership degree of element A_m on evaluation index V_n , that is to say, the quality of the evaluated object in A_m can be expressed by evaluation index V_n .

Synthetic Fuzzy Evaluation Result Matrix

The obtained weight set W is synthesized with the fuzzy matrix R , and the formula $B=W \times R$ is used to obtain:

$$B=W \times R= \{W_1, W_2, \dots, W_n\} \times \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ r_{m2} & r_{m3} & \cdots & r_{mn} \end{bmatrix} = \{B_1, B_2, \dots, B_m\} \quad (2)$$

B_m indicates the degree of membership of the assessed object at level V_i .

Analysis of Evaluation Results

In principle, according to the principle of maximum membership degree, the evaluation index corresponding to the maximum value in set B is the final evaluation result of the evaluated object. However, we can not ignore other values in set B that have a relatively large proportion. Considering the maximum membership degree alone may cause information loss and result in incomplete evaluation results.

EXAMPLES OF APPLICATION OF RISK ASSESSMENT MODEL FOR MATERIAL MISSTATEMENT IN M&A AUDIT

W Group, as a renowned diversified holding conglomerate in China, has leveraged its substantial capital strength, extensive business layout, and exceptional brand influence to demonstrate robust market competitiveness across multiple industries. In recent years, with the acceleration of global economic integration and the maturing of the domestic market, W Group has acutely recognized that relying solely on its current business scale and market share is insufficient to meet long-term development needs. Consequently, the group's management made a decisive move to prioritize market expansion and industrial upgrading as the core of its future development strategy, aiming to continuously broaden its business horizons, enhance technological proficiency and service quality, and further consolidate and expand its market-leading position. Against this backdrop, W Group's focus turned to K Enterprise. As a small-to-medium enterprise (SME) deeply rooted in a specific high-tech sector for years, K Enterprise boasts unique technological advantages, innovative capabilities, and a stable market share, enjoying high recognition and a good reputation within the industry. K Enterprise's technological achievements are not only leading domestically but also competitive internationally, presenting W Group with valuable opportunities for industrial upgrading and market expansion. To further bolster its competitiveness in this high-tech sector, W Group decided to strategically acquire K Enterprise. Through the acquisition, W Group will gain access to K Enterprise's advanced technology, research and development capabilities, and market resources, enabling it to quickly tap into new markets, expand its business scope, and extend its industry chain. Meanwhile, leveraging K Enterprise's innovation capabilities and market sensitivity, W Group can accelerate industrial upgrading and technological innovation, enhancing the core competitiveness of its overall business and laying a solid foundation for sustainable development in the future. Therefore, W Group's acquisition of K Enterprise is not just a simple act of market expansion but a crucial step in the group's strategic transformation and industrial upgrading. The success of this acquisition will directly impact W Group's position and influence in future market competition, carrying significant strategic significance and research value.

Index Selection

Next, taking the acquisition of K enterprise by W Group as an example, the application of the risk assessment of material misstatement in M&A audit under the fuzzy comprehensive evaluation method is elaborated. The first thing to face is the selection of indicators. According to the method and the characteristics of the company as well as the results obtained from the

expert discussion, we divided the evaluation indicators into five categories: external environment A1, merger and integration A2, accounting policy A3, internal control A4, and audit institution A5. Each of these five categories contains a series of sub-indicators, as shown in Table 1.

Table 1. Risk assessment index system of material misstatement for W Group's acquisition of K enterprise

Primary index	Secondary index
External environment A ₁	Industry competition A ₁₁ , legal impact A ₁₂ , government subsidies A ₁₃
M&a Integration A ₂	Integration plan A ₂₁ , corporate culture A ₂₂ , human resources A ₂₃
Accounting Policy A ₃	Complex accounting measurement A ₃₁ , significant accounting adjustments A ₃₂
Internal Control A ₄	Internal control system A ₄₁ , internal control supervision A ₄₂ , organizational structure A ₄₃
Audit Organization A ₅	Professional ability A ₅₁ , moral quality A ₅₂

Weight Allocation

According to the influence degree of each indicator, each expert in the expert group gives an evaluation weight for each influencing factor of the evaluation matrix, and then obtains the final evaluation result by calculating the weight. The weight sets of the first-level indicators are W= (0.1, 0.3, 0.3, 0.2, 0.1), and the weight sets of the second-level indicators are: W1= (0.4, 0.4, 0.2), W2= (0.4, 0.1, 0.5), W3= (0.6, 0.4), W4= (0.4, 0.3, 0.3), W5= (0.7, 0.3).

Establish Evaluation Set and Evaluation Matrix

When assessing the risk of material misstatement, the auditors of the accounting firm score the risk of material misstatement according to the level of the influencing factors. According to the actual needs of K enterprise, the expert group divides the evaluation set into three levels: high, medium and low, namely the evaluation set V= (V1, V2, V3). The auditors' evaluation results are summarized in Table 2 and Figure 1:

Table 2. Summary of evaluation results

Primary index	Secondary index	Evaluation result		
		High	medium	low
External environment A ₁	Industry competition A ₁₁	0.3	0.5	0.2
	Legal impact A ₁₂	0.2	0.7	0.1
	government subsidies A ₁₃	0.1	0.3	0.6
M&a Integration A ₂	Integration plan A ₂₁	0.5	0.3	0.2
	corporate culture A ₂₂	0.2	0.2	0.6
	human resources A ₂₃	0.6	0.3	0.1
Accounting Policy A ₃	Complex accounting measurement A ₃₁	0.4	0.5	0.1
	significant accounting adjustments A ₃₂	0.3	0.4	0.3
Internal Control A ₄	Internal control system A ₄₁	0.4	0.2	0.4
	internal control supervision A ₄₂	0.2	0.5	0.3
	organizational structure A ₄₃	0.2	0.4	0.4
Audit Organization A ₅	Professional ability A ₅₁	0.6	0.4	0
	moral quality A ₅₂	0.4	0.3	0.3

Therefore, the evaluation result matrix of the secondary index can be obtained:

$$R_1 = \begin{bmatrix} 0.3 & 0.5 & 0.2 \\ 0.2 & 0.7 & 0.1 \\ 0.1 & 0.3 & 0.6 \end{bmatrix} \quad (3)$$

$$R_2 = \begin{bmatrix} 0.5 & 0.3 & 0.2 \\ 0.2 & 0.2 & 0.6 \\ 0.6 & 0.3 & 0.1 \end{bmatrix} \quad (4)$$

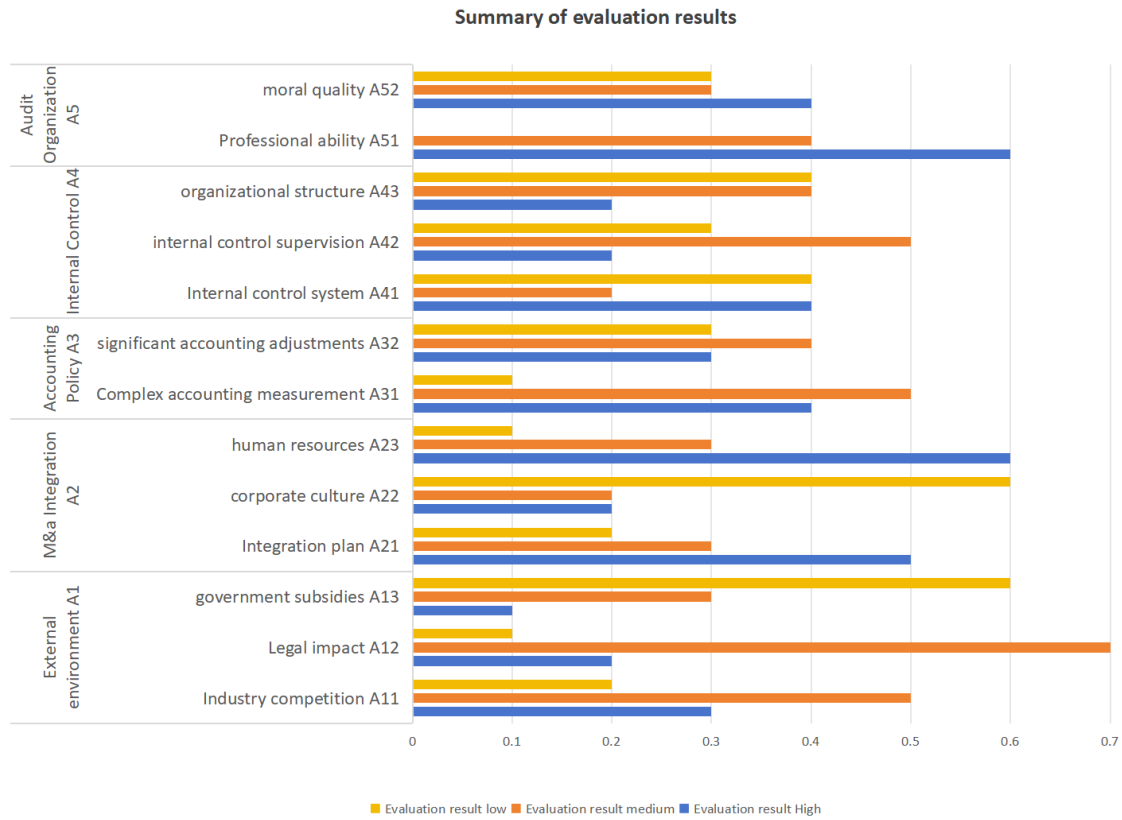


Figure 1. Summary of evaluation results

$$R_3 = \begin{bmatrix} 0.4 & 0.5 & 0.1 \\ 0.3 & 0.4 & 0.3 \end{bmatrix} \quad (5)$$

$$R_4 = \begin{bmatrix} 0.4 & 0.2 & 0.4 \\ 0.2 & 0.5 & 0.3 \\ 0.2 & 0.4 & 0.4 \end{bmatrix} \quad (6)$$

$$R_5 = \begin{bmatrix} 0.6 & 0.4 & 0 \\ 0.4 & 0.3 & 0.3 \end{bmatrix} \quad (7)$$

Fuzzy Evaluation

First-level fuzzy comprehensive evaluation

The results of the secondary evaluation are evaluated by the primary fuzzy evaluation. According to the formula $B=W \times R$:

$$B_1 = W_1 \times R_1 = (0.4, 0.4, 0.2) \times \begin{bmatrix} 0.3 & 0.5 & 0.2 \\ 0.2 & 0.7 & 0.1 \\ 0.1 & 0.3 & 0.6 \end{bmatrix} = (0.22, 0.54, 0.24) \quad (8)$$

$$B_2 = W_2 \times R_2 = (0.4, 0.1, 0.5) \times \begin{bmatrix} 0.5 & 0.3 & 0.2 \\ 0.2 & 0.2 & 0.6 \\ 0.6 & 0.3 & 0.1 \end{bmatrix} = (0.52, 0.29, 0.19) \quad (9)$$

$$B_3 = W_3 \times R_3 = (0.6, 0.4) \times \begin{bmatrix} 0.4 & 0.5 & 0.1 \\ 0.3 & 0.4 & 0.3 \end{bmatrix} = (0.36, 0.46, 0.18) \quad (10)$$

$$B_4 = W_4 \times R_4 = (0.4, 0.3, 0.3) \times \begin{bmatrix} 0.4 & 0.2 & 0.4 \\ 0.2 & 0.5 & 0.3 \\ 0.2 & 0.4 & 0.4 \end{bmatrix} = (0.28, 0.35, 0.37) \quad (11)$$

$$B_5 = W_5 \times R_5 = (0.7, 0.3) \times \begin{bmatrix} 0.6 & 0.4 & 0 \\ 0.4 & 0.3 & 0.3 \end{bmatrix} = (0.54, 0.37, 0.09) \quad (12)$$

The results show that 22% of people think that the risk of this merger is high under external environmental factors, 54% think it is medium, 24% think it is low. According to the principle of maximum membership, the risk under the influence of external environmental factors is medium. The same goes for the last four factors.

Two-level fuzzy comprehensive evaluation

The matrix is obtained from the first-order fuzzy evaluation results:

$$R = \begin{bmatrix} 0.22 & 0.54 & 0.24 \\ 0.52 & 0.29 & 0.19 \\ 0.36 & 0.46 & 0.18 \\ 0.28 & 0.35 & 0.37 \\ 0.54 & 0.37 & 0.09 \end{bmatrix} \quad (13)$$

The weights of first-level indicators are used for second-level fuzzy evaluation:

$$B = W \times R = (0.1, 0.3, 0.3, 0.2, 0.1) \times \begin{bmatrix} 0.22 & 0.54 & 0.24 \\ 0.52 & 0.29 & 0.19 \\ 0.36 & 0.46 & 0.18 \\ 0.28 & 0.35 & 0.37 \\ 0.54 & 0.37 & 0.09 \end{bmatrix} = (0.396, 0.386, 0.218) \quad (14)$$

The results show that 39.6% of the respondents consider the risk of material misstatement as high, 38.6% as medium, and 21.8% as low for the risk of W Group's merger and acquisition of K company. According to the principle of maximum membership, the risk of material misstatement of W Group's acquisition of K enterprise should be rated as "high". However, considering that the results of the high-risk and stroke risk segments are close, the final risk of material misstatement can be rated as medium-high risk.

CONCLUSION AND PROSPECT

This paper uses the fuzzy comprehensive evaluation method to evaluate the risk of material misstatement in M&A audit from qualitative to quantitative, and applies it to the example of W Group's merger and acquisition of K company to bring a more accurate assessment of W Group's risk of material misstatement. Compared with other methods, the fuzzy comprehensive evaluation method comprehensively considers the influence of various risk factors. By constructing appropriate models, the weight analysis and membership calculation of these factors are carried out, so as to evaluate the risk of material misstatement more accurately. The application of fuzzy comprehensive evaluation method to the risk assessment of material misstatement in M&A audit provides a strong support for the selection of indicators, overcomes some shortcomings of traditional methods, and is closer to the objective reality, which is conducive to the scientific and comprehensive discovery of problems in the process of M&A and the timely adoption of preventive measures.

In future studies, this method can also be combined with other audit techniques and methods to form a more perfect M&A audit system. For example, a risk-based audit approach can be used in combination. Risk-based audit is a systematic and standardized method, which is guided by the analysis and evaluation of the risks of financial statements, and improves the efficiency and effect of audit by identifying, evaluating and coping with the risks of the business environment, business process and financial statements of the audited entity. Fuzzy comprehensive evaluation method can provide more accurate guidance for risk-based audit through comprehensive analysis of the risk of material misstatement, make auditors pay more attention to high-risk areas, and improve the pertinence of audit. In addition, internal control audit methods can be combined. Internal control audit is the

process of auditing the effectiveness of the design and operation of an enterprise's internal control. Through the internal control audit, we can find the weak link of the enterprise's internal control, and then evaluate its impact on the financial statements. Fuzzy comprehensive evaluation method can be combined with internal control audit to evaluate the internal control status of enterprises, so as to evaluate the reliability of financial statements more comprehensively. At the same time, fuzzy comprehensive evaluation method can be combined with data analysis technology. Data analysis technology can process and analyze a large number of data to find the potential relationship and law between the data. The combination of fuzzy comprehensive evaluation method and data analysis technology can provide the basis for the evaluation of major error risk, and improve the objectivity and accuracy of the evaluation.

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