

Application Research and Analysis of Management Accounting in Enterprise Strategy Based on FAHP Model

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ABSTRACT

On the basis of summarizing the previous research directions and results of management accounting, and referring to some literature, this paper designs an index system for the application research of management accounting in enterprise strategy, which includes the first-level evaluation indexes, including enterprise management, enterprise development, value creation and core competitiveness, and 16 second-level evaluation indexes including operation management, risk management, competition and cooperation strategy. Through the fuzzy analytic hierarchy process, combined with an expert scoring method to determine the primary and secondary index weight, analyze and discuss the influence of each index in enterprise strategy. The results show that the proportion of core competitiveness and enterprise development is the largest, which are 26.57 % and 26.07 %, respectively. Enterprises need to focus on strategic decisions. The system is practical and feasible for enterprise strategy and has certain practical significance for enterprise management.

Keywords: Management Accounting; Enterprise Strategy; Index System; Fuzzy Analytic Hierarchy Process

1. INTRODUCTION

In recent years, with the development of economic globalization, the Ministry of Finance has gradually shifted its focus to the study of the management accounting system to meet the urgent need of China's economic transformation and enterprises for long-term development. In particular, from 2014 ~ 2017, the Ministry of Finance issued several policy articles such as "guidance on comprehensively promoting the construction of management accounting system" and carried out research and case collection to actively promote the construction and application of management accounting system. It can be seen that management accounting is becoming a hot topic in recent research. It is a general trend to study and analyze the frontier problems of management accounting from different angles for adapting to the reform and development.

Looking at the past research directions, experts and scholars have made in-depth qualitative research from summarizing history, development trends, talent research and practical application. Based on the integration of industrial and financial information, Hua [1] constructed the application framework of management accounting

information in the context of big data from the four inflows of business flow, capital flow, information flow, and stakeholder flow, and discussed the application of this framework in the three major business activities of manufacturing supply, marketing, production, and marketing. Song [2] adopted literature research method, expert scoring method, empirical research method, questionnaire survey method etc. By constructing a multiple linear regression model, empirical management accounting is an important driving factor for enterprise value creation. Ao [3] analyzed and studied the innovation and integration of the process unit price, dual-mode, '225' budget system, F2C management around the cost control of management accounting, risk control, value-added and performance evaluation of the core content of four aspects. Zhou [4] put forward the institutionalization model of management accounting reform and made an institutional analysis on the management accounting reform in field enterprises. Zhao [5] built an enterprise management accounting reporting framework with the strategic level, management level, and operation level as the application subjects, and the corporate strategy, internal control and risk, corporate operation, finance and taxation, and social responsibility as the reporting objectives.

However, the above research results cannot directly reflect the rationality and objectivity of enterprise management. In the decision-making process of enterprise strategy, many inevitable problems such as fuzziness, uncertainty, and subjectivity are often affected by the external factors of a complex environment and the internal factors of decision makers' knowledge level. If the influence of various strategic factors on enterprise strategy cannot be quantitatively analyzed, there must be a certain degree of blindness in the formulation of enterprise strategy. To solve this problem, this paper intends to combine the fuzzy analytic hierarchy process with management accounting, do quantitative research on qualitative problems, use a fuzzy judgment matrix to determine the weight of each factor, and establish the analytic hierarchy model of enterprise strategy application research to improve the accuracy of judgment, and finally provide the optimal solution for decision-makers. The application of this method can not only objectively evaluate the weight influence of factors on corporate strategy, but also solve the problems such as membership degree, which has a positive effect on improving corporate strategy and creating value. Therefore, this paper uses a fuzzy analytic hierarchy process to analyze the application of management accounting in enterprise strategy, to provide strong theoretical support for enterprise choice decisions.

2. CONSTRUCTION OF RESEARCH AND ANALYSIS INDEX SYSTEM OF MANAGEMENT ACCOUNTING IN ENTERPRISE STRATEGY

Concerning the index system of several corporate management literature [6-8] and based on the analysis of the research and application of management accounting in corporate strategy, this paper selects 16 important indicators such as business management, human resource management, risk management, asset management, scientific research management, and accounting management to construct the management system of corporate strategy and systematically analyze the strategic management of enterprises. The analysis system consists of three levels of ABC: A layer is the target layer composed of corporate strategy, which represents the object of management; layer B is the criterion layer composed of four analysis indicators, namely, enterprise management B1, enterprise development B2, value creation B3 and core competitiveness B4, which represents the management criterion; layer C is a scheme layer composed of four types of management indicators including layer B1, five types of management indicators of layer B2, four types of management indicators of layer B3 and three types of management indicators of layer B4, which represents the elements of management. The three-layer structure affects each other and is controlled by the upper layer or the lower layer, respectively.

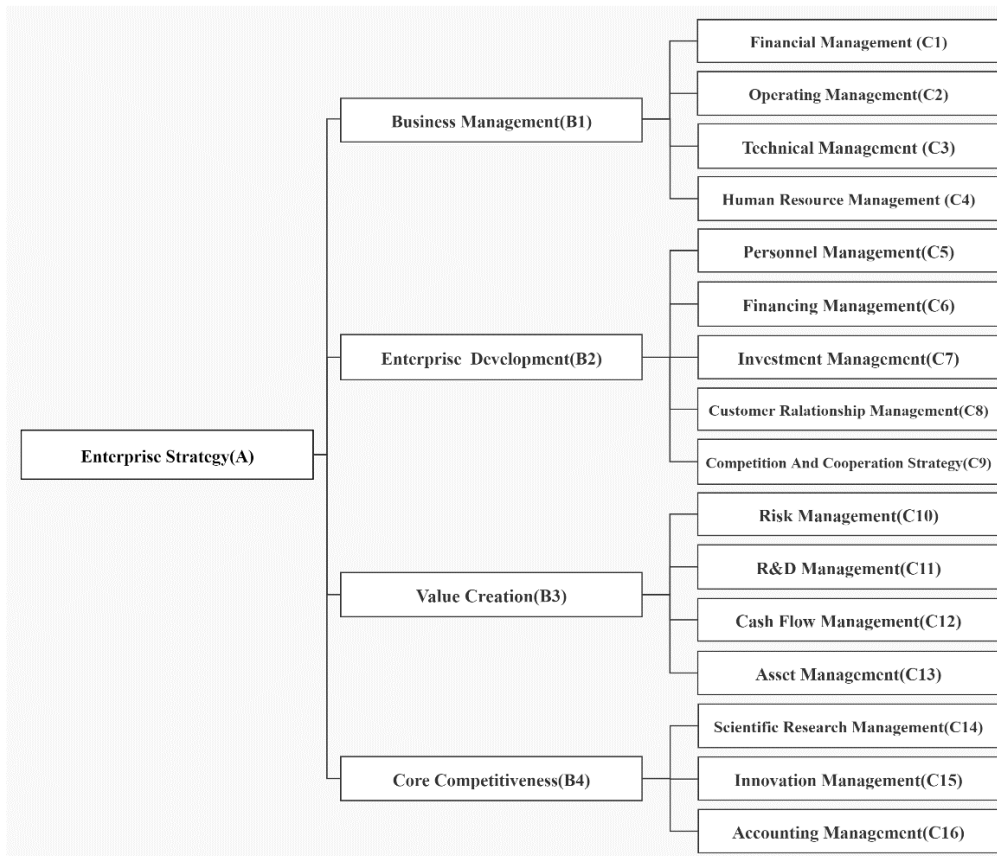


Figure 1 Research index system of the application of management accounting in corporate strategy

3. ESTABLISHMENT OF ENTERPRISE STRATEGIC ANALYSIS MODEL BASED ON FAHP

3.1 Basic Ideas of Fuzzy Analytic Hierarchy Process

AHP was first proposed by L. T. SATTY, a professor of operations research in the 1970s. The main process is to use numbers 1~9 to assign each element in the matrix by pairwise comparison, determine the relative importance of each element, and finally obtain the weight of comprehensive elements. It combines quantitative and qualitative methods to solve complex problems such as multi-objective and multi-level. But the application of AHP will make the subjectivity and fuzziness of human thinking affect the final result. To solve this problem, the American professor Burckley introduced the fuzzy number in the fuzzy theory to form the fuzzy analytic hierarchy process and replaced the “judgment matrix” in AHP with the “fuzzy matrix”, which not only reduced the influence of subjective factors on the evaluation index but also solved the problems such as the difficulty of consistency test.

3.2. Calculation of index weight based on fuzzy analytic hierarchy process

STEP1: Establish a judgment matrix by hierarchical structure and use T.L. Satty's nine-point scale method.

STEP2: Calculate the weight of the fuzzy judgment matrix and test the consistency.

$$\beta_i = (\sum_{j=1}^N a_{ij} + \frac{N}{2} - 1) / N(N - 1) \quad (1)$$

Among them, $\beta_{ij} = \beta_i - \beta_j + 0.5$, i and j are valued at 1, 2, 3..., N. The process of checking the consistency of the fuzzy matrix is the weight matrix W of fuzzy judgment matrix S, if $CI(S, W) \leq 0.1$, the fuzzy judgment matrix S passes the consistency check.

$$CI(S, W) = 1 / N^2 \sum_{i=1}^N \sum_{j=1}^N |a_{ij} - \beta_{ij}| \quad (2)$$

STEP3: Hierarchical ranking of fuzzy judgment matrix based on feature root method. Firstly, the sum of each column of the fuzzy judgment matrix is obtained, and then the index of the fuzzy judgment matrix is divided by the sum of the corresponding columns to obtain the standard fuzzy judgment matrix. Finally, the average value of each row of the standard fuzzy judgment matrix is calculated to obtain the standardized weight of each index, and the total ranking weight of the hierarchy is calculated.

$$a_j = \sum_{i=1}^N a_{ij} \quad (3)$$

$$b_{ij} = \frac{a_{ij}}{a_j} \quad (4)$$

$$b_j = \frac{\sum_{i=1}^N b_{ij}}{N} \quad (5)$$

$$w_i = \sum_{j=1}^N w_j w_{ij} \quad (6)$$

4. EVALUATION CASES

4.1. Research object and data collection

To quantitatively describe the relative importance between any two indicators, the Delphi method is used to design the questionnaire and synthesize ten expert opinions, as shown in Tables 2to6.

TABLE 1 RATINGS BETWEEN CORPORATE STRATEGY LEVEL INDICATORS

	B1	B2	B3	B4
B1	0.50	0.39	0.46	0.47
B2	0.62	0.50	0.53	0.45
B3	0.56	0.47	0.50	0.45
B4	0.53	0.55	0.55	0.50

TABLE 2 RATINGS BETWEEN BUSINESS MANAGEMENT B1 INDICATORS

	C1	C2	C3	C4
C1	0.50	0.38	0.55	0.52
C2	0.62	0.50	0.57	0.48
C3	0.45	0.43	0.50	0.37
C4	0.48	0.52	0.63	0.50

TABLE 3 SCORES BETWEEN ENTERPRISE DEVELOPMENT B2 INDICATORS

	C5	C6	C7	C8	C9
C5	0.50	0.40	0.48	0.56	0.45
C6	0.60	0.50	0.50	0.55	0.47
C7	0.52	0.50	0.50	0.63	0.44
C8	0.44	0.45	0.37	0.50	0.25
C9	0.55	0.53	0.56	0.75	0.50

TABLE 4 VALUE CREATION AMONG B3 INDICATORS

	C10	C11	C12	C13
C10	0.50	0.64	0.72	0.50
C11	0.37	0.50	0.52	0.35
C12	0.28	0.48	0.50	0.35
C13	0.50	0.65	0.65	0.50

TABLE 5 SCORES BETWEEN COMPETING STRATEGY B4 INDICATORS

	C14	C15	C16
C14	0.50	0.35	0.65
C15	0.65	0.50	0.66

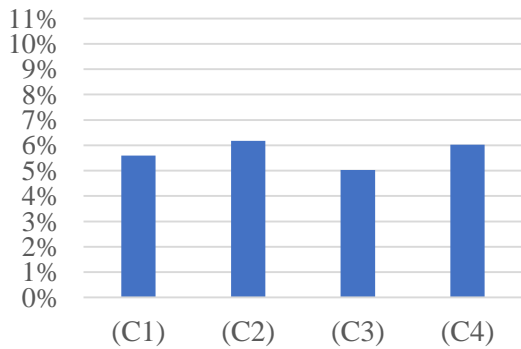
C16 0.35 0.35 0.50

4.2. FAHP calculation

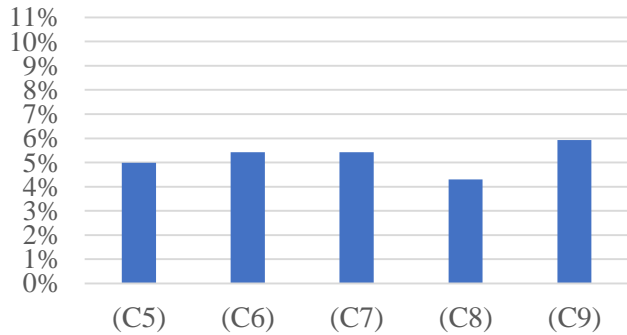
Combined with Table 1to5 and formula 1to6, the weight of each index of enterprise strategy is calculated by SPASSAU, as shown in Table 6:

Table 6 Analysis Index System of Management Accounting in Enterprise Management

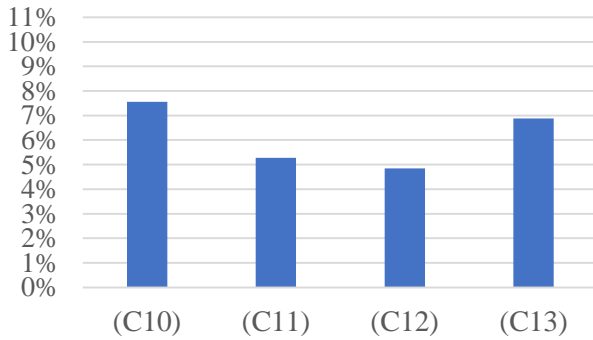
	First-level indicator	Weight	Secondary indicators	Weight
Enterprise Strategy	Business Management	22.82%	Financial Management	5.60%
			Operating Management	6.17%
			Technical Management	5.03%
			Human Resource Management	6.02%
	Enterprise Development	26.07%	Personnel Management	4.99%
			Financing Management	5.43%
			Investment Management	5.42%
			Customer Relationship Management	4.30%
	Value Creation	24.54%	Competition And Cooperation Strategy	5.93%
			Risk Management	7.55%
			R&D Management	5.27%
			Cash Flow Management	4.85%
	Core Competitiveness	26.57%	Asset Management	6.88%
			Scientific Research Management	8.99%
			Innovation Management	10.75%
			Accounting Management	6.84%



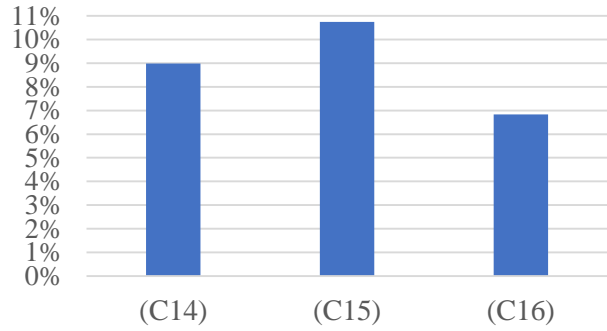
(a) Index Weight Map in Business management



(b) Index Weight Graph Enterprise Development



(c) Index Weight Graph in Value Creation



(d) Index weight chart of Core Competitiveness

Figure 2 Weight calculation result

4.3 Results analysis

4.3.1. Analysis and discussion of first-level indicators

According to Table 6, it can be concluded that the factor index ranked first among the first-level risk factors is the largest weight of core competitiveness (26.57%), followed by enterprise development (26.07%), value creation (24.54%), and business management (22.82 %).

The key of business strategy is to cultivate and develop the core competitiveness of enterprises. The so-called core competitiveness is “the accumulated knowledge in the organization, especially how to coordinate different production skills and organically integrate various technological flows”. Enterprises should choose one aspect according to their resources, knowledge and ability to fully play its advantages and become the most skilled. In addition, we should also pay attention to the cultivation of new core competitiveness in the future, to permanently maintain the leadership of core competitiveness and become the leader of future industries.^[9]

Enterprise development is the enterprise to adapt to the future unknown environment, the further operation to achieve business objectives. It mainly includes the research on development direction, development speed, and quality. This paper discusses five aspects: competition and cooperation strategy, financing management, investment management, personnel management, and customer relationship management.

Value creation refers to a series of business activities and cost structures of enterprises to produce and supply products or services that meet the needs of target customers. This paper explores its value-added role to enterprises from the four elements of risk management, asset management, scientific research management, cash flow.

Enterprise management is the general term for a series of activities such as planning, organization, command, coordination, and control of enterprise production and operation activities, which is the objective requirement of socialized mass production. Its impact on the management level can be studied from four perspectives: business management, human resource management, financial management, and technical management.

4.3.2. Analysis and discussion of secondary indicators

a) Core competitiveness. According to the weight value equal (8.99%, 10.75%, 6.84%), the biggest weight is innovation management, accounting for 10.75%. Innovation is the source of the vitality of enterprises. In today's s era of the knowledge economy, enterprises are required to update their management concepts constantly. The concept of innovation is implemented in the whole enterprise management process, that is, institutional innovation, concept innovation, and market innovation, to maximize enterprise value and management efficiency and promote greater development space in the future.

The second is scientific research management, accounting for 8.99%, mainly controlling the enterprise's scientific research cost and ensuring the quality and quantity of research and development, and the protection of patented technological achievements, etc. The scientific research management level directly affects the scientific research effectiveness and technological innovation ability of enterprises. Improving the level of scientific research management is not only the need to build world-class enterprises with international competitiveness but also the need to implement the development strategy of an innovative country.^[10]

The last is accounting management, accounting for 6.84%, is relatively secondary in core competitiveness, including the enterprise accounting organization, work, system management. Accounting management can

standardize the accounting affairs of enterprises so that enterprises can achieve value-added.

b) Enterprise development. According to the weight value equal (4.99%, 5.43%, 5.42%, 4.30%, 5.93%), the largest weight is the co-opetition strategy, accounting for 5.93%. Refers to the competition and cooperation between enterprises strategy. Balancing the relationship between cooperation and competition in different business fields has a significant impact on the strategic state and process of enterprises to achieve maximum benefits and sustainable development.

The second is financing management, accounting for 5.43%. Refers to the enterprise through internal and external financing business investment activities required funds and the amount and proportion of funds management. Financing management provides important financial support for enterprises in the process of implementing strategy.

Again, investment management, accounting for 5.42%. It includes real business investment, innovation project investment, and joining chain management. It is the basic premise of enterprise development and an important means of risk control and lays a foundation for enterprises to obtain profits in the future.

Then it is personnel management, accounting for 4.99%. It refers to the managing personnel amount, structure proportion, and several leaders according to legal provisions and enterprise system. Establishing a fair and impartial personnel management system helps enterprises effectively achieve the expected goals.

The last is customer relationship management, accounting for 4.30%. Refers to through the integration of sales, marketing and service processes to enhance corporate profitability, increase corporate income, is committed to the establishment, development, and utilization of good personal relationships with new and old customers. This is the smallest proportion in enterprise development, but it also needs attention.

c) Value creation. According to the weight distribution equal (7.55%,5.27%,4.85%,6.88%), risk management has the largest weight in value creation, accounting for 7.55%. It includes the measurement of risks and coping strategies. Fully understanding the nature and severity of their risks can enable enterprises to take appropriate measures to avoid and reduce the losses caused by risks, and compensate enterprises in other ways to ensure that enterprises quickly return to normal production and business activities.

The second is asset management, accounting for 6.88%. That is the operation of assets with the goal of property preservation and appreciation, including financial products and entrusted investment. Among them, financial products are the core of asset management. This management method mainly improves

the value of enterprise management by optimizing asset allocation.

Again, scientific research management, accounting for 5.27%. That is the whole management process of planning and implementing scientific research projects and applying and evaluating relevant research results. In recent years, the total R & D expenditure of Chinese enterprises accounts for more than half of society. Therefore, the management of the scientific research system plays a vital role in enterprise value-added.

The last is cash flow management, accounting for 4.85%. According to the motion state, cash flow can be divided into dynamic cash flow and static cash flow. Dynamic cash flow refers to the amount of cash and cash equivalent inflows and outflows within a certain period of time, while static cash flow refers to the number of monetary funds available at any time such as cash in stock. In terms of management methods, the former includes the management of the direction and control of capital flows, and the latter is the internal management of assets such as cash. Although cash flow accounts for a small proportion of enterprise value-added, it cannot be ignored. As the life of the enterprise, only doing a good job in cash flow management can ensure the normal operation of the enterprise, and realize the value creation.

d) Enterprise management. According to the weight distribution equal (5.60%,6.17%,5.03%,6.02%), the largest weight is management, accounting for 6.17%. It refers to the plan, organization, command, coordination, and control of enterprise operating activity funds to meet social needs and pursue the economic benefits of enterprises. We can effectively improve the business management ability of enterprises by designing enterprise systems, controlling production business processes, formulating marketing strategies, and establishing brand culture.

The second is human resources management, accounting for 6.02%. It refers to the efficient use of relevant human resources inside and outside enterprises through recruitment, selection, and training. The management level of human resources can be improved mainly through human resource planning, recruitment and dismissal system, training and development, salary and welfare standards.

Financial management, accounting for 5.60%. The financial activities of asset purchase, capital financing, and working capital management. At present, the traditional financial management model obviously cannot meet the needs and development of enterprise management. Only by constantly updating the management concept, innovating from the aspects of mode, method, and object can enable enterprises to obtain a larger market share, bringing new profit sources for business operations.

The last is technical management, accounting for 5.03%. It refers to the planning, development, and implementation of technical capabilities to achieve corporate strategy and operational objectives. Although this proportion is the smallest in enterprise management, it runs through the whole process of technological innovation activities from information exploration to the success of final product development, which largely promotes the positive development of enterprise performance. Enterprises can upgrade from technology forecasting, product design, information exchange, technology updates, etc.

5. CONCLUSION

By building the index system of enterprise strategy, this paper uses fuzzy analytic hierarchy process to calculate and analyze the proportion of each index in enterprise strategy research, which makes up for the shortcomings of previous research review methods and proves that enterprise strategy research based on fuzzy analytic hierarchy process has certain pertinence and feasibility. Finally, a comprehensive evaluation of corporate strategy, the following three conclusions:

a) Review and summarize the previous literature on corporate strategy, build the index evaluation system of management accounting in the use of corporate strategy based on enterprise management, enterprise development, value creation, and core competitiveness.

b) Quantitative research on the impact of corporate strategy based on FAHP not only avoids the subjectivity and singularity of the traditional model, but also effectively quantifies the weight of each factor, and sorts them according to the level of weight. This will provide decision-makers with more reliable and effective data.

c) Enterprises in the choice of strategy portfolio, should be combined with the organization's situation, the appropriate focus shifted to the core competitiveness and enterprise development, in particular, to increase innovation management and co-opetition strategy research efforts.

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