

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

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Abstract. With the advent of the digital economy era, traditional management accounting is facing great challenges. More and more attention has been paid to the role of management accounting in corporate strategy, and it has gradually evolved into a new branch of accounting, also known as "strategic management accounting". Analysis and evaluation of relative levels and trends of price, business volume, market share and cash flow. In order to study the factors that affect management accounting in the evaluation of enterprise strategy, this paper firstly constructs the enterprise strategy index system from the perspective of management accounting, then invites experts to score each index, and finally uses FAHP (Fuzzy Analytic Hierarchy Process) to calculate the weight value of each index. Quantitative and qualitative evaluation of each index set can obtain the weights of the importance of different schemes, provide a basis for selecting the best scheme, give guidance for the formulation of the company's goals in the next stage, and also have great significance for the construction of a new management accounting system.

Key words: FAHP; corporate strategy; application; management accounting.

1. Introduction

The advent of the digital economy era has made traditional management accounting face great challenges. Facing the digitalization of production and management activities, management accounting should review the situation, update management accounting concepts, techniques and methods, accelerate the implementation of management accounting transformation, construct a new management accounting system and model, and innovate the development path of management accounting in China^[1].

The role of management accounting in corporate strategy has gradually evolved into a new branch of accounting, also known as "strategic management accounting", and the early research on the system of management accounting in corporate strategy in China mainly focused on the connotation, objectives, status and characteristics of strategic management accounting.

However, the application of management accounting in enterprise strategy in China is still in the initial stage, and many enterprises have not even established a complete financial accounting system. With the further development of theoretical research and the use of management accounting in practice in the future development of corporate strategy will certainly have an important impact, early, some scholars have conducted research on strategic management accounting methods which are more representative of the research, mainly in cost management research: Zhang, Wu^[2] will be involved in strategy formulation on a macro level, optimization and business process matching on a micro level. Establishing strategic management accounting executive team as the method of strategic management accounting enterprise transformation and upgrading; Xie and Liu^[3] included value chain analysis, competitor analysis and quality cost analysis in the methods of strategic management accounting and discussed them; in recent years, scholars gradually combined with the development of SMEs: Shi^[4] believed that establishing a perfect management system and strengthening the strategic management of SME leaders Part of the discussion, however, the text related to it is sparse strategic management

accounting evaluation system research is less. Closely related to strategic accounting of enterprise development strategy, its research is mainly focused on management disciplines, and its evaluation system is more complete and has some reference significance. Therefore, in this paper, based on the existing research in the discipline and management discipline, combined with the extensive nature of strategic accounting, to explore the factors affecting the evaluation of management accounting in enterprise strategy, and based on the fuzzy hierarchical analysis, try to evaluate the preferences of enterprise design strategy.

The research in this paper is conducive to the realization of strategic management objectives and comprehensive quality management of enterprises. Provide activity-based cost management means for the internal management of the enterprise itself, so as to ensure that the cost of the enterprise in production can be minimized, and the consumption of resources can also reach the minimum value . It can also achieve financial risk early warning analysis for enterprises to help enterprises create greater value.

2. Construction of management accounting in enterprise strategy index system

Since the 1980s, the development of high technology and the increasing international market competition have made traditional management accounting increasingly unable to adapt to the changes of market and competitive environment. The theories and methods of traditional management accounting are based on the internal point of view of the enterprise and do not link the internal information of the enterprise with the changes in the external environment, lacking a series of indicators closely related to the strategic objectives of the enterprise such as rapid information system integration, reliability, flexibility of production, customer satisfaction, time, etc., lacking the analysis of the relative position of the enterprise in the competition, unable to provide and analyze the cost, price, business volume and other indicators related to the competitive position of the enterprise. It does not provide and analyze accounting information on costs, prices, business volume, market share, cash flow, and resource requirements related to a firm's competitive position^[5].

For this reason, management accounting scholars have conducted a lot of research on how to make management accounting adaptable to the needs of strategic management and provide appropriate information and effective control tools for strategic management of enterprises. They have focused their research on the analysis and judgment of accounting information for the competitive position of enterprises and the improvement of their competitive advantages, such as the analysis and evaluation of the relative levels and trends of costs, prices, business volumes, market shares and cash flows. These researches expand the traditional management accounting research field, combine with the analysis of competitors to examine the competitive position of the enterprise, examine the organizational setup, product development, marketing and resource allocation of the enterprise from a strategic point of view, and provide internal and external, financial and non-financial, qualitative and quantitative accounting information based on which the competitive advantage is achieved, and provide information for the enterprise to take advantage of its strengths, exploit opportunities, overcome weaknesses, avoid threats to provide information and create conditions. It provides information and creates conditions for enterprises to exploit their strengths, exploit opportunities, overcome weaknesses, and avoid threats. These researches make strategic management accounting begin to take shape, and management accounting begins to step into a new stage of development. Based on the rooting theory, the system of enterprise strategy indicators from the perspective of management accounting is obtained as shown in Table 1.

Table 1. Corporate strategy indicator system from management

Level 1 Indicators	Secondary Indicator	Indicator codes	Reference
Economic efficiency	Business development strategy	X_1	[6]
	Value Chain Creation Capability	X_2	[6]
	Product Market Share	X_3	[6]
	Comprehensive performance assessment and evaluation	X_4	[7]
Competition and Cooperation	Compound "accounting" big data talent training	X_5	[8]
	Competitors	X_6	[7]
	Customer group	X_7	[8]
Cost	Quality cost	X_8	[8]
	Human Resource Costs	X_9	[8]
Management	Accounting information system	X_{10}	[7]
	Risk Control Capability	X_{11}	[7]
	Sustainable development environmental protection	X_{12}	[6]
	Market Positioning	X_{13}	[8]

3. FAHP Method

3.1 Fuzzy

Professor L. A. Zadeh, an American expert in automatic control, introduced the concept of fuzziness in 1965. Fuzzy set theory states that everything exhibits a certain degree of elasticity. When fuzzy numbers are used to assess the judgement of decision makers in pairwise comparisons of alternatives following a parsing hierarchy process, a certain degree of flexibility is already present and can be quantified through a number of formulas^[8].

3.2 AHP Method

Analytic hierarchy process^[9] (AHP) was formally proposed by American operations researcher Professor Thomas L. Saaty in the 1970s as a system evaluation method that combines qualitative and quantitative analysis methods. By decomposing a complex problem into multiple levels and elements, comparing the elements of each level, establishing a judgment matrix according to a certain scale, and calculating the maximum characteristic roots of the judgment matrix and its corresponding characteristic vectors, the weights of the importance of different solutions can be obtained, providing a basis for selecting the best solution. The general steps are

STEP1 Establish a hierarchical model:

The problem is organised and hierarchical, and a hierarchical structure model is constructed. According to the interrelationship between the decision objectives, decision criteria and decision objects, it is divided into the highest level, the middle level and the lowest level. This is shown in Figure 1.

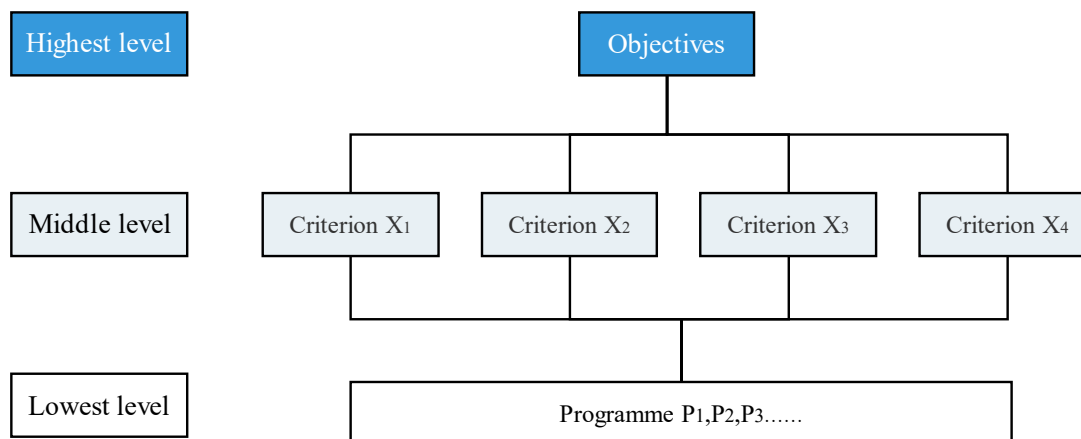


Figure 1. Schematic diagram of the hierarchy

STEP2 Construct the judgment matrix for each level:

Pairwise comparison matrices were constructed according to their relative importance and assigned using scales 1 to 9 as suggested by Saaty et al. The meanings of the scales are shown in Table 2.

Table 2. Saaty scales description

Scale a_{ij}	Definition	Description
1	Equally important	Factor i is of equal importance to factor j
3	Slightly more important	Factor i is slightly more important than factor j
5	Obviously important	Factor i is significantly important relative to factor j
7	Strongly Important	Factor i is strongly important relative to factor j
9	Extremely important	Factor i is extremely important relative to factor j
2, 4, 6, 8	Adjacent median scales	Intermediate values for the above comparisons The ratio of the importance of factor i to factor j is
Countdown	Inverse comparison	a_{ij} , and vice versa is $\frac{1}{a_{ij}}$

STEP3 Hierarchical single sorting and consistency check:

The eigenvector w of the maximum eigenvalue $\lambda_{\max}$ corresponding to the judgement matrix A , after normalisation, is the ranking weight of the corresponding factor at the same level with respect to the relative importance of a factor at the previous level. A consistency test is also required for the comparison results, and the consistency of the judgment matrix is acceptable when $CR \leq 0.10$.

STEP4 Hierarchical total ordering and decision making :

The steps are similar to the hierarchical single sort.

3.3 Combined with the fuzzy AHP

AHP is mainly used to analyse decisions by building judgement matrices, but the rationality and scientificity of decisions are affected to a certain extent by over-reliance on subjective experience, which can only exclude serious non-conformities. To solve the above problems, the majority of scholars introduced the fuzzy concept to make the analytical evaluation of AHP more scientific, where Faran Ahmed ^[10,11] et al. evaluated the performance of various algorithms by comparing three parameters such as the size of the comparison matrix, fuzziness and inconsistency level. The performance of the fuzzy inverse column sum method (FICSM) was found to be superior at low to medium inconsistency levels, and the results were made more realistic through analysis.

4. Application of Management Accounting Based on Fuzzy Analytic Hierarchy Process Model in Enterprise Strategy

4.1 Construction of the Rating Matrix

In order to quantify the decision-making judgment, in the analytic hierarchy process, the 1-9 scale method proposed by Satty is generally used to compare the two indicators to construct the judgment matrix. This paper invites eight project managers and experienced managers who are familiar with the development of the enterprise to form an expert group to compare the elements of management accounting at the same level of the enterprise strategic index system, and take the comparison results as the basis for decision-making, and then make scores on this basis. Through sorting out, communication and repeated validity measurement, on the basis of expert scoring integer average, finally obtained the effective expert scoring. The judgment matrix is as follows:

$$\begin{pmatrix} 0.5 & 0.7 & 0.6 & 0.75 \\ 0.3 & 0.5 & 0.4 & 0.7 \\ 0.4 & 0.6 & 0.5 & 0.7 \\ 0.25 & 0.3 & 0.3 & 0.5 \end{pmatrix} \quad \begin{pmatrix} 0.5 & 0.7 & 0.7 & 0.75 \\ 0.3 & 0.5 & 0.3 & 0.7 \\ 0.3 & 0.7 & 0.5 & 0.75 \\ 0.25 & 0.3 & 0.25 & 0.5 \end{pmatrix} \quad \begin{pmatrix} 0.5 & 0.3 & 0.2 \\ 0.7 & 0.5 & 0.4 \\ 0.8 & 0.6 & 0.5 \end{pmatrix} \quad (1)$$

$$\begin{pmatrix} 0.5 & 0.4 \\ 0.6 & 0.5 \end{pmatrix} \quad \begin{pmatrix} 0.5 & 0.3 & 0.25 & 0.25 \\ 0.7 & 0.5 & 0.3 & 0.3 \\ 0.75 & 0.7 & 0.5 & 0.4 \\ 0.75 & 0.7 & 0.6 & 0.5 \end{pmatrix} \quad (2)$$

4.2 AHP and FAHP calculation

Based on the above constructed matrix and the use of software, this paper calculates the weights of AHP and FAHP respectively. The calculation results are shown in Table 3 :

After collecting and analyzing a lot of data, it can be intuitively found that among the four first-grade indicators (criterion level) set in this paper, the weights of AHP and FAHP of economic benefit B1 are the largest, with values of 0.46 and 0.31 respectively, while the share of management B4 is the smallest, and the weights of AHP and FAHP are 0.08 and 0.18.

Specific solution to each index layer, according to the calculation results, it can be concluded that for the economic benefit B1, the business development strategy C11 is more prominent, and its AHP and FAHP weights are 0.49 and 0.32; in the competition and cooperation B2, customer group C23 is the most important factor, and its AHP and FAHP weights are 0.58 and 0.43; in the cost B3, the quality cost C31 has less impact, and the weight values of AHP and FAHP are 0.33 and 0.40; finally, for the management of B4, the market positioning C44 occupies a relatively critical position, and its AHP and FAHP weights are 0.45 and 0.31 respectively.

In summary, AHP and FAHP have their respective scope of application and limitations. The calculation formula of AHP has a scaling effect on the result, which makes the result extremely important. However, the FAHP formula has no scaling effect on the results and the scale interval difference is small, which can well indicate the slight and obvious importance. Therefore, when using the analytic method, the weight obtained by FAHP can satisfy the intention of the decision-maker.

Table 3. Position of Management Accounting in Enterprise Strategy Weight Calculation Comparison Table

Criterion layer	AHP weight	FAHP weight	Indicator layer	AHP weight	FAHP weight
economic benefit (B1)	0.463	0.311	Business Development Strategy (C11)	0.490	0.322
			Value chain creation ability (C12)	0.152	0.228
			product market share (C13)	0.283	0.278
			Comprehensive Performance Evaluation(C14)	0.076	0.172
competition and cooperation (B2)	0.176	0.239	Compound ' accounting ' big data talent training(C21)	0.109	0.208
			Competitor(C22)	0.310	0.358
			Customer group(C23)	0.582	0.433
cost(B3)	0.275	0.272	Quality cost(C31)	0.333	0.400
			Human resource costs(C32)	0.667	0.600
Management (B4)	0.085	0.178	Accounting information system(C41)	0.077	0.172
			Risk control(C42)	0.154	0.228
			Sustainable development in environmental protection(C43)	0.318	0.289
			Market positioning(C44)	0.450	0.311

5. Discussion and recommendations

Through the calculation of the FAHP weights in the criterion-level indicators of the influencing factors of the application of management accounting in enterprise strategy, it can be seen that: economic efficiency is the main factor affecting enterprise strategy. In order to achieve the strategic objectives of the enterprise, management accounting of the enterprise can enhance the economic efficiency of the enterprise in the following four aspects: (1) using scientific and advanced management methods to analyse and forecast the capital movement of the enterprise in a certain period of time in the future and formulate the business development strategy of the enterprise; (2) optimising the supply chain of the enterprise, establishing scientific operational processes and creating interactive relationships with customers; (3) analysing market demand, improving analyse market demand, improve product quality and expand product market share; (4) use the balanced scorecard to evaluate the strategic performance of the enterprise and give guidance for the formulation of the enterprise's next stage goals.

Through the analysis of the weighting of each influencing factor in the index layer, it can be seen that in terms of economic benefits, the enterprise business development strategy has the greatest weight (0.32); in terms of competition and cooperation, customer groupness has the greatest weight (0.43); in terms of cost, human resources cost has the greatest weight (0.60); and in terms of management, market positioning has the greatest weight (0.31). In order to enhance the application of management accounting in corporate strategy, this paper makes the following recommendations:

(1) Develop a suitable business development strategy for the enterprise. The business development strategy determines the future development direction and major action steps of an enterprise and is related to the rise and fall of the enterprise. The most important of these is to determine the direction of development as well as business objectives.

(2) Developing the customer base. The success of an enterprise is to satisfy its customers. By analysing the preferences of its customer groups, it develops appropriate strategies to improve its

products and services and achieve internal value optimisation. By establishing good relationships with customer groups, companies can both reduce costs and realise external value.

(3) Reducing human resource costs. Human resource costs are the input of all resources in the operation of a business. Management accounting can reduce human resource costs by reducing functional costs, creating a corporate culture and realising the best use of resources to reduce human resource costs.

(4) Capture the market positioning of the enterprise. Market positioning is the beginning of an enterprise's strategy, which aims to establish a unique image in the minds of target customers in order to enhance the competitiveness of products.

6. Conclusion

In this paper, in order to study the factors affecting management accounting in enterprise strategy evaluation, we firstly construct the enterprise strategy index system from the perspective of management accounting, secondly ask experts to score each index, and finally use FAHP method to calculate the weight value of each index to evaluate each index set quantitatively and qualitatively. The conclusions are as follows:

(1) The most important aspect of management accounting in the evaluation of corporate strategy is economic efficiency.

(2) Among the indicator layers, business development strategy, customer groupness, human resource cost and market positioning are better weighted.

In this paper, by using FAHP method to evaluate the factors of management accounting in the strategic evaluation of enterprises to evaluate the preferential selection, and finally arrive at the index with the greatest influence factor, which is of great significance to the construction of the new management accounting system.

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