Research on the Cause of Marketing Risk of New Tea Beverage Enterprises in China Based on the ISM-MICMAC Model

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Abstract. In order to provide an effective reference for the operation, development and investment decisions of new tea beverage enterprises, this paper investigates the influencing factors of marketing risk in the new tea beverage industry, determines 14 indicators affecting marketing risk in the new tea beverage industry by reviewing relevant literature and expert research. Then, an explanatory structural model (ISM) is constructed to reveal the logical relationship between the factors, and the cross-influence matrix multiplication method (MICMAC) is used to analyze dependency and driving force analysis. The results show five levels of the recursive structural model of marketing risk factors in China's new tea beverage industry. Based on the MICMAC driving force analysis, we believe that the more dependent influences need to be controlled by strengthening other risk factors that can have an impact on them, and that sufficient attention should be paid to the influences with higher driving forces, so as to facilitate the normal corporate marketing activities of new tea beverage companies.

Keywords: New tea beverage industry; Influencing factors; ISM; MICMAC.

1. Introduction

At the beginning of 2022, in order to maintain profitability, Tea Face and Xi Cha announced price increases. In recent years, with the upgrading of consumption in China, new tea drinks as a synonym of "fashion and leisure", loved by consumers. Because of this, China's new drinking industry has developed rapidly, intensifying the competition of the new tea drinking industry. However, there are also many problems behind the rapid growth of the new tea beverage industry. The imperfect industry standards and low entry barriers have led to frequent food safety and production hygiene problems and a high degree of product homogenization in the industry due to the low production technology content. There are few studies on this subject.

China's new tea and beverage industry research mainly focuses on the current development status, development trends and marketing strategy. Li [1] takes Xi Cha as an example, analyzes the environment faced by Xi Cha, and analyzes its marketing strategy; Yin [2] mainly analyzes the current status and development trend of the new tea and beverage industry; Liu [3] explores the current characteristics and problems of the new tea and beverage consumer market and proposes relevant strategies for the industry's development; Liu mainly analyzes the existing problems of the new tea and beverage industry, mainly its food safety. Liu [4] analyzes the existing problems of the new tea beverage industry, mainly its food safety issues. Li [5] analyzes the definition, classification and development history of the new tea beverage industry, and explores the current situation of the new tea beverage industry chain as well as the opportunities and challenges it faces; Jiang [6] analyses the characteristics of the new tea beverage and the current situation of the industry, and puts forward several future prospects. Industry's current situation, trends and development strategies have been studied. However, there is no systematic research on the direction of many variables, complex
relationships and unclear structures, such as corporate marketing risk factors, as well as the failure to visualize the results.

This paper constructs 14 influencing factors affecting the marketing risk of new tea beverages from three aspects: enterprise's own marketing risk, macro-environment marketing risk and micro-environment marketing risk, and uses the explanatory structural model (ISM) technique to determine the correlation between factors affecting marketing risk in the new tea beverage industry, calculates and decomposes the reachability matrix, and derives the inherent hierarchy of marketing risk factors in the new tea beverage industry. Then, using the driver-dependency diagram of the cross-influence matrix (MICMAC), the influencing factors are classified into three types of factors: dependent, spontaneous and independent, and for the different types of influencing factors, the critical factors and priority links affecting the marketing risk of the new tea and beverage industry are identified, and then the underlying risk factors, as well as the core drivers affecting the marketing risk of the new tea and beverage industry, are discovered. Through the research and combing of the causes of marketing risks in the new tea and beverage industry, it provides a powerful reference value for decision making in business operation, company development and investment decisions, and provides a powerful guarantee for companies to seize the market opportunities.

2. Construction of a marketing risk indicator system for the new tea beverage industry

2.1 Problems in marketing the new tea and beverage industry

With the rapid development of China's economy and society, people's living standards are also improving. Coupled with the change in consumer attitudes, the new tea and beverage, as an integral part of leisure and entertainment consumption, have been expanding in industry scale, and there are also many marketing risks.

As far as the enterprises themselves are concerned, the new tea beverage industry has a low technological content, the recipes are easily imitated, and the industry lacks effective barriers. Hence, the degree of product homogenization is high, and the degree of competition between enterprises has increased. Secondly, the lack of protection of intellectual property rights in the new tea industry often leads to trademark infringement, causing serious problems for businesses and consumers and negatively impacting the brand image.

In terms of the external environment, the new tea and beverage industry have significant food safety concerns that directly affect the industry's future development. In addition, the risk of marketing the new tea and beverage industry is further exacerbated by the changing economic situation, unclear product policy direction, and various unforeseen circumstances.

2.2 Indicators affecting marketing risk in the new tea and beverage industry

Through an in-depth search of the literature related to new tea beverage, combined with the knowledge learned, we communicate with industry experts and enterprises. In this paper, a total of 14 factors influencing the marketing risk of new tea beverages were selected from three perspectives: the company's own marketing risk, the micro-environment marketing risk, and the macro environment marketing risk. Among them, the influencing factors of the enterprise's own marketing risk are $S_1 \sim S_6$. The factors influencing micro-environment marketing risk are $S_7 \sim S_8$ and the macro environment marketing risk factors are $S_9 \sim S_{14}$. In summary, this paper constructs the new tea beverage industry marketing risk influence factors index system, as shown in Table 1.
<table>
<thead>
<tr>
<th>Table 1. New Tea Industry Marketing Risk Factors</th>
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<tbody>
<tr>
<td>Tier 1 indicators</td>
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<tr>
<td>High product homogenization</td>
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<tr>
<td>Complex and changing marketing channels</td>
</tr>
<tr>
<td>Inadequate protection of product intellectual property rights</td>
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<tr>
<td>Operating costs continue to rise</td>
</tr>
<tr>
<td>Low technological innovation capacity</td>
</tr>
<tr>
<td>Inefficient corporate marketing</td>
</tr>
<tr>
<td>Rapid product renewal</td>
</tr>
<tr>
<td>Food safety issues</td>
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<tr>
<td>Lack of management talent</td>
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<td>Changes in the economic situation</td>
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<td>Instability of unexpected factors</td>
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<tr>
<td>Low-tech products are easily copied</td>
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<tr>
<td>Lack of industry oversight mechanisms</td>
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<td>Unclear policy direction</td>
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</table>
3. Interpretative Structural Modeling Method

The Interpretative Structural Modeling Method (ISM) is a systematic scientific research method proposed by John N. Warfield in 1973 to analyze and solve complex social problems. After analyzing and judging the relationship among the elements of each subsystem, the matrix deals with the elements and their relationship, and the conceptual model is mapped to a directed graph. The ISM model is mainly qualitative analysis, transforming the complex system into an intuitive structural relationship model. The causal hierarchy and ladder structure of each system element can be clearly seen through the structural relationship model. Based on the complexity and diversity of the influencing factors of marketing risk factors of new tea beverage enterprises, the ISM model is adopted to analyze them. The steps of the ISM model are as follows.

**STEP1: Build Adjacency Matrix A.**

According to whether there is a direct relationship between the influencing factors $S_i$ and $S_j$ of the marketing risk factors of new tea beverage enterprises, the adjacency matrix $A = \left( a_{ij} \right)_{n \times n}$ between each factor can be determined. The adjacency matrix element $a_{ij}$ is defined as follows:

$$a_{ij} = \begin{cases} 
1, & S_i \text{ directly influence } S_j \\
0, & S_i \text{ indirectly influence } S_j 
\end{cases}$$

**STEP2: Calculate the reachable matrix.**

The Adjacent matrix A can reflect the direct relationship between the elements but cannot reflect the indirect relationship between the various elements. It is necessary to calculate the reachable matrix $R$ to describe the extent to which the internal factors in the system can reach through various channels. According to the Boolean algebra operation rules, the adjacency matrix A can be calculated, that is, $R = (A + I)^{\lambda+1} = (A + 1)^{\lambda} \neq (A + I)^{\lambda-1}$, where $I$ is the identity matrix. The reachable matrix $R$ can represent the direct and indirect effects between the elements from $S_i$ to $S_{j4}$, as well as the transitivity between the elements, that is, $S_i$ can reach $S_j$, $S_j$ can reach $S_h$, then $S_i$ can reach $S_h$.

**STEP3: Decompose the hierarchy of reachable matrix.**

After calculating the reachable matrix $R$, it is necessary to decompose the reachable matrix and establish the structural model. According to the analysis of the reachable set $R(S_i)$, the antecedent set $Q(S_i)$ and the common set $R(S_i) \cap Q(S_i)$ of each factor $S_i$, the risk-sharing factors are decomposed into a different independent hierarchy. Among them, $R(S_i)$ is composed of the elements corresponding to the column whose all matrix elements are 1 in the $S_i$ row of the reachable matrix $R$; $Q(S_i)$ is composed of the elements corresponding to all rows of matrix element 1 in the $S_i$ column of reachable matrix $R$. After finding out $R(S_i)$, delete the corresponding rows and columns from the reachable matrix, and then calculate the remaining reachable matrix.

**STEP4: Build the ISM model.**

According to the result of factor hierarchy and reachable matrix, the ISM model of influencing factors of marketing risk in new tea beverage enterprises can be obtained.

4. Cross-impact matrix multiplication Method

Based on determining the Interpretative Structural Modeling, we can use the cross-impact matrix multiplication (MICMAC) to analyze the marketing risk factors of new tea beverage enterprises. MICMAC model is generally used to study the interaction and dependence of various elements in the system in a complex environment, so as to match the appropriate solutions. Using the principle of
matrix multiplication, the driving force and its dependence on each element in reachable matrix \( R \) can be obtained. The results can be presented in the coordinate axis, and the horizontal and vertical coordinates represent each element's dependence and driving force, respectively. The stronger the driving force of an element, the greater the impact of that element on other elements in the system; the stronger the dependence of an element, the greater the influence of other elements in the system on that element. The operation steps of MICMAC are as follows:

**STEP1:** According to formula (2) and formula (3), the driving force \( D_i \) and dependence \( R_j \) of each element in reachable matrix \( R \) is obtained, where \( i = 1, 2, \ldots, n \), \( j = 1, 2, \ldots, n \).

\[
D_i = \sum_{j=1}^{n} S_{ij}
\]

\[
R_j = \sum_{i=1}^{n} S_{ij}^{m}
\]

In the formula, \( S_{ij}^{m} \) is an element in reachable matrix \( R \); the driving force \( D_i \) is the degree to which the element is driven by other elements in the system; the dependence \( R_j \) is the degree to which an element in the system depends on other elements. It can be seen from the formula that the driving force of each factor is determined by the sum of the corresponding row elements corresponding to the factor in the reachability matrix \( R \), and the dependence is determined by the sum of the corresponding column elements corresponding to the factor in the reachable matrix \( R \).

**STEP2:** Draw the driving force-dependence quadrant diagram.

Depending on the driving force and dependence, the influencing factors of marketing risk in new tea beverage enterprises can be divided into four categories: spontaneous, dependence, linkage, and independent. Among them, the driving force and dependence of spontaneous factors are relatively weak, and the overall connection and correlation with the system are minor, but the influence of the system is strong; The driving force of the dependent factors is weak, and the dependence is strong, which is greatly affected by other factors. The solution of such factors usually depends on the solution of other problems. The driving force and dependence of linkage factors are exceedingly strong, and all their changes may interfere with other factors and have a feedback effect on themselves, which is extremely unstable; Independent factors have a strong driving force and weak dependence, which strongly influence other factors, but are not easily affected by other factors, and are the most fundamental and deepest factors in the set of influencing factors. Based on the above four categories, we can draw the driving force-dependence quadrant diagram to analyze the interaction between marketing risk factors of new tea enterprises.

5. **Empirical Analysis**

5.1 **ISM construction of marketing risk factors for new tea beverage companies**

5.1.1 **Establishing adjacency matrix and reachability matrix**

There may be a direct correlation between the influencing factors of developing new tea beverage enterprises in the Chinese market. The Delphi method is used to generate the adjacency matrix by comparing the factors affecting the marketing risk of new tea beverage enterprises by seven experts in related fields. Since the role of each influencing factor may be mutual, only the direct influence relationship is considered, but not the indirect influence relationship. The direct influence relationship between the factors can be expressed by establishing the adjacency matrix \( A = (a_{ij})_{n \times n} \), if the influencing factor \( S_i \) directly affects the factor \( S_j \), then note \( a_{ij} = 1 \), \( (i > j) \), if the influencing
factor $S_i$ does not directly affect the factor $S_j$, then note $a_{ij} = 0 (i > j)$, establish the adjacency matrix in Table 2.

<table>
<thead>
<tr>
<th>Table 2. Adjacent Matrix</th>
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<tr>
<td>$S_1$ $S_2$ $S_3$ $S_4$ $S_5$ $S_6$ $S_7$ $S_8$ $S_9$ $S_{10}$ $S_{11}$ $S_{12}$ $S_{13}$ $S_{14}$</td>
</tr>
<tr>
<td>$S_1$ 0 0 0 1 0 1 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>$S_2$ 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>$S_3$ 1 0 0 1 0 0 0 0 0 0 0 1 1</td>
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<td>$S_4$ 0 0 0 0 1 0 0 0 0 0 0 0 0</td>
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<td>$S_5$ 1 0 0 0 0 0 0 0 0 0 1 0 0</td>
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<tr>
<td>$S_6$ 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
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<tr>
<td>$S_7$ 1 0 0 0 0 1 0 0 0 0 0 0 0</td>
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<td>$S_8$ 0 0 0 1 0 0 0 0 0 0 1 0 0</td>
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<td>$S_9$ 0 0 0 1 0 0 0 1 0 0 0 0 0</td>
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<td>$S_{10}$ 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
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<td>$S_{12}$ 1 1 0 0 0 0 0 0 0 0 0 0 0</td>
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<td>$S_{13}$ 0 0 1 0 0 0 0 1 0 0 0 0 0</td>
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<tr>
<td>$S_{14}$ 0 0 0 0 0 0 0 1 0 0 0 0 0</td>
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</table>

5.1.2 Calculate the reachable matrix

According to Table 2, adjacency matrix $A$ to get the reachable matrix $R$, its operation process is based on the adjacency matrix to introduce the unit matrix, through the software $SPSSAU$, using $MMult$ and $If$ functions, and applying Boolean algebraic calculation to the matrix $A + 1$, until $R = (A + I)^{i+1} = (A + I)^2 \neq (A + I)^{i+1}$, where $R = (A + I)$ is the reachable matrix. After calculation, $r = 4$, then $R = (A + I)^4 = (A + I)^5$.

5.1.3 Hierarchy division of Influencing factors

Based on the reachable matrix, the influence relationships between each risk factor and the influenced relationship are summarized, where the influence relationship is called the reachable set and denoted by $R$; the influenced relationship is called the antecedent set and denoted by $Q$; the intersection set of factors $S_i$ is obtained and denoted by $R(S_i) \cap Q(S_i)$.

5.1.4 Construction of ISM model

According to Table 5 and the reachable matrix to find out the division of influencing factors between each level in turn, and can find out all the division of influencing factors and the interrelationship between them (Figure 1).

Fig. 1 Explanatory structure model of influencing risk factors of TEA DRINKS enterprises
5.1.5 ISM model analysis

Influencing factors at the top: As can be seen from Figure 1, the influencing factors located in the \( L_1 \) are element \( S_2 \) variable marketing channels, element \( S_6 \) low efficiency of enterprise marketing, element \( S_{10} \) changes in the economic situation. These three influencing factors are the risk factors affecting the surface of the new tea beverage enterprise marketing and the most direct factors affecting the development of new tea beverage enterprises. They are the ultimate goal of the system. This layer of factors is mainly dependent on the middle layer and the bottom layer of influencing factors to be solved, and the factors of this layer do not affect each other, independent of each other.

Influencing factors in the bottom layer: As can be seen from Figure 1, the influencing factor located in the \( L_5 \) is element \( S_{14} \) unclear policy guidance. This only risk factor is the deep risk affecting the marketing risk of new tea beverage enterprises, which is the primary risk factor for new tea beverage enterprises to consider in the face of enterprise marketing.

Other influencing factors between the top and bottom: the influencing factors located in \( L_2, L_3 \) and \( L_4 \) are the intermediate risk factors affecting new tea beverage enterprises: elements \( S_1, S_4, S_5, S_{11}, S_{12}, S_7, S_8, S_3, S_9, S_{13} \). Although these factors are not at the bottom of the system, they are obstacles that need to be addressed independently. And they are also playing a key role in the risk factors new tea beverage enterprises will face in the corporate marketing process.

5.2 MICMAC Analysis

5.2.1 Driving force-dependence quadrant division

The average value of both driving force and dependency is 6.4286. The results are divided into quadrants according to each influencing factor's driving force and dependency, as shown in Figure 2. Driving force is located at the x-axis and dependency is located at y-axis.

Explanation: Here, the abscissa and ordinate are the driving force and dependence, respectively.

5.2.2 Influencing factors MICMAC analysis

According to Figure 2, which analyzes the driving force and dependency values, all the influencing factors are divided into different quadrants. It is found that the risk factors affecting the marketing of new tea beverage enterprises can only be categorized into three types of risk factors: spontaneous, dependent, and independent. MICMAC analysis was conducted for each factor affecting the marketing of new tea beverage enterprises.
Spontaneous factors include: $S_{11}$ which is located in quadrant III. It has a certain driving force, and also has certain dependence, and is in the second layer of risk factors affecting the marketing of new tea beverage enterprises, involving the most superficial factors of the marketing of new tea beverage enterprises in $L_1$. It increases the possibility of causing the risk that enterprises' marketing cannot be carried out according to the plan, so they are the risk factors that should be paid attention to by new tea beverage enterprises.

Dependency factors include: $S_1, S_4, S_5, S_{10}, S_{12}, S_2$, which are located at quadrant IV. Compared to the drivers, these risk factors are more dependent, that is, very susceptible to the influence of other risk factors, such as the $S_{12}$ is influenced by $S_{11}$ and $S_3$, therefore, this quadrant of risk factors can be strengthened by strengthening the control of other risk factors that can impact it, to make this quadrant of factors in a benign state, to promote the normal business marketing activities of new tea beverage enterprises.

Independent factors include: $S_7, S_8, S_{14}, S_9, S_{13}$ located in quadrant II. Compared to dependency, these risk factors have a higher driving force. They can be considered as the source of risk affecting the marketing of new tea beverage enterprises. Not only are they not easily controlled by other risk factors, but once these risk factors are uncontrolled, a series of "butterfly effects" will occur, so they should be given attention. $S_{14}$ is located at the bottom, indicating that the driving force value in the deepest risk factors may be relatively large.

6. Conclusion

Marketing risk factors of new tea drink enterprises are complex and diverse. This paper divides them into 14 factors from three aspects: the enterprise itself marketing risk, macro-environmental marketing risk, and micro-environmental marketing risk, and uses the ISM model and MICMAC model to analyze these 14 factors:

(1) By using ISM technology, this paper analyzes the relevance of the 14 influencing factors of the marketing risk in new tea drink enterprises, calculates and decomposes the reachable matrix, and draws the hierarchical directed graph, thus obtaining the internal hierarchical structure of the influencing factors of marketing risk, which is divided into "bottom,""middle" and "top."

(2) MICMAC method analyzes the driving force and dependence of each influencing factor, which is integrated into three types of factors: dependence, spontaneous and independent, and then the corresponding risk response measures are obtained. Among them, the instability of sudden factors should be paid more attention to by enterprises; The replicability of low-tech products has high dependence and low driving force, indicating that the key to solving this factor lies in solving other factors first; The ambiguity of policy orientation has a high driving force and low dependence, indicating that the solution to this factor does not lie in solving other factors.

Acknowledgments

The order of the author's name is in alphabetical order, and the workload of each author is equivalent.

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