

Value Assessment of Enterprise Marketing Channels

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Abstract

The factors that impose influence on the value assessment of enterprise's marketing channels are numerous, and complex in relations with each other. Whether the value of enterprise's marketing channels is good or not can finally be determined by using principal component analysis to eliminate the related effects among the assessment indicators and reduce the workload of selecting indicators, and expert evaluating and assessing the value of enterprise's marketing channel by relevant indicators.

Keywords: Marketing channel, Value assessment, Principal component analysis

1. Introduction

Marketing Channels refers to the concrete passages or paths through which the products and services transfer from the producers to the consumers. As the marketing environment of enterprises at present is constantly changing, the establishment of high-value marketing channels has becoming the key to influence the market's marketing ability and thus get successful in competition. Therefore, enterprises have to make decision in terms of the channel's value, from the selection of the channels' design plan to the periodic analysis of existing channels, even to the adjustment of the overall marketing channels. The value of marketing channels is an issue of polytomy variable. When statistical analysis is used to study problems of polytomy variable, the number of the variable, if many, will make the analysis more complex, thus, attempt to reduce the number of variable but keep the information content unchanged proves to be the key to solve such problems. Conventional value assessment of marketing channels usually proceeds from the angle of performance. However, in practice, there are so many factors influencing the assessment of enterprise's marketing channels and what's more, the relations among them are intricate. Principal component analysis is such a statistical method that converts one multivariable who relates to each other into few aggregate variables that is unrelated to each other. Moreover, making the variance contribution rate of the principal component as the weighting can give birth to an objective scoring model for the object to be assessed.

2. Methods

Principal component analysis is also called factor analysis, whose basic principle is to form a linear combination fit to original variables to produce a series of new discrete variables, from which a few variables are chosen and make them contain enough information that the original variables bring. Then such several new variables are used to analyze and solve problems, thus making problems relatively simpler. The principal component analysis consists of the following steps:

(1) Initialization indicators

If provided with P indicators, and n objects observed, there will be n P-vector, which can be expressed by matrix table.

(2) Normalizing processing is taken for the matrix above and a relative matrix of variables will be created, whose formula is as follows:

$$\bar{X} = \frac{1}{n} \sum_{j=1}^n X_{ij} \quad (i=1,2,3,\dots,p)$$

$$S_j = \frac{1}{n-1} \sum_{j=1}^{n-i} (X_{ij} - \bar{x}_i)_{n-1} \quad (i=1,2,3,\dots,p)$$

$$R=(r_{ij})_{p \times p}$$

(3) Calculation of characteristic root of related matrices

Upon calculating related matrices, the characteristic values of such matrices shall be figured out respectively.

And then evaluate the characteristic roots of P for a in accordance with the characteristic equation $|R - aE| = 0$.

$$0 \leq a_1 \leq a_2 \leq \dots \leq a_p$$

(4) Calculation of the contribution rate and expression of principal component

Define $r_k = a_k / \sum_{i=1}^p a_i$ as the contribution rate of the K^{th} principal component, and $\sum_{i=1}^m a_i / \sum_{j=1}^p a_j$ as the

cumulative contribution rate of principal component from the first to m^{th} . In the actual problems, if the cumulative contribution rate of principal component from the first to m^{th} exceed over 85%, these principal components from the first to m^{th} can replace all the original assessment indicators.

(5) Calculation of the value of principal component

The comprehensive assessment shall be conducted on the basis of the principal component. The comprehensive assessment indicator V can be valued as the weighted average of the principal component from the first to m^{th} , the weight number as the contribution rate. All channels can be ranked in accordance with the V value. The one with the largest V value is the channel to be chosen.

3. Assessment Indicators and Processes of Enterprise Marketing Channels

3.1 Assessment indicators of marketing channels

The path that products transfer from the producers to the consumers is marketing channel. Marketing channels vary with such factors as channel structure and channel member. Therefore, enterprises are in face of decision on optimization of marketing channels. In practice, to make assessment and selection for channel values, enterprises should have a set of indicator system to assess and select the channel values. Currently, enterprises depend on channel objectives and various channel limit conditions (such as products, market conditions and enterprise's own conditions) to make decision on marketing channels. Understood from maintaining the sustained competitive power, ensuring channel members' satisfaction and proving strong support for enterprise marketing management, the assessment of marketing channels is a comprehensive assessment problem of multiple levels, factors and objectives; its operation is effected and limited not only by the large system of society outside, but also by its own current operational factors inside, and even more by structure deep in the enterprise's channel system. The assessment indicators of channel values should consist of channel's controllability, completion of channel objectives, satisfaction of channel members, channel costs, channel's stable sustainability and channel efficiency.

3.2 Processes of enterprise marketing channels

According to the characteristics of enterprise products and the marketing situation, and in combination with the principle of principal component analysis for multivariate statistics, the process of enterprise marketing channels is as follows:

Step 1: determining the assessment factor of marketing channels;

Step 2: establishing expert group and scoring;

Step 3: acquiring original data;

Step 4: establishing the model of principal component analysis;

Step 5: establishing comprehensive assessment model

Step 6: calculating and comparing assessment analysis

4. Examples of Value Evaluation on Enterprises Marketing Channel

4.1 Defining the evaluation factors and mark

According to the actual situation of the enterprises and the related channel evaluation standard, the evaluation

factors of the value evaluation models of enterprise marketing channel can be designed as follows:

- X₁.....The steerability of channel
- X₂.....The completion of Channel objective
- X₃.....The inspiration to channel members agent
- X₄.....Channel cost
- X₅.....The stable and sustainable capacity of channel
- X₆.....Channel efficiency

4.2 Obtaining the raw data by taking expert marking

Marking rules mean that every expert mark channel' situation of every year under every evaluation. The most optimum one can gain 9 scores, while the least optimum one gain 1 score. After a preliminary statistical, the scores of channel at every year under every evaluation factors has been reached, see the table below:

The score table on overall evaluation of marketing channel

| The year of channel | Evaluation factors | | | | | |
|---------------------|--------------------|----------------|----------------|----------------|----------------|----------------|
| | X ₁ | X ₂ | X ₃ | X ₄ | X ₅ | X ₆ |
| 2006 | 6.5 | 2.5 | 3 | 7 | 3.5 | 5 |
| 2007 | 7 | 2.5 | 2.5 | 6 | 3.2 | 5.8 |
| 2008 | 7.5 | 2.5 | 2 | 5 | 3.1 | 6.4 |

4.3 The establishment of value evaluation models of enterprise marketing channel

(1) Get the correlation matrix R

Write the data table above as matrix

$$X = \begin{pmatrix} 6.5 & 2.5 & 3 & 7 & 3.5 & 5 \\ 7 & 2.5 & 2.5 & 6 & 3.2 & 5.8 \\ 7.5 & 3 & 2 & 5 & 3.1 & 6.4 \end{pmatrix}$$

After normalizing the matrix, we get:

$$X = \begin{pmatrix} 1 & 0.59 & 1 & 1 & 1.1 & 1.04 \\ 0 & 0.59 & 0 & 0 & 0.26 & 0.1 \\ 1 & 1.14 & 1 & 1 & 0.81 & 0.96 \end{pmatrix}$$

x_{ij} is the sample correlation coefficient between X_i (the factor i) and X_j (the factor j). sample correlation matrix is R=(r_{ij})_{6×6}. After calculating, we get sample correlation matrix R as a symmetric matrix.

$$R = \begin{pmatrix} 1 & 0.49 & 1 & 1 & 0.94 & 1 \\ 0.49 & 1 & 0.49 & 0.49 & 0.18 & 0.43 \\ 1 & 0.49 & 1 & 1 & 0.94 & 1 \\ 1 & 0.49 & 1 & 1 & 0.94 & 1 \\ 0.94 & 0.18 & 0.94 & 0.94 & 1 & 0.96 \\ 1 & 0.43 & 1 & 1 & 0.96 & 1 \end{pmatrix}$$

(2) Obtain characteristics root and eigenvector of R

Find 6 characteristics roots by |R - aE|=0. Among the 6 characteristics roots, a₁=5.12 a₂=0.87, the corresponding contribution rates are r₁=0.83; r₂=0.14, the contribution rates have reaches r₁+r₂>0.90, in other

words, the principle component has included 90% information, therefore, we can use this principle component as a new aggregative indicator to replace the primary 6 indicators.

$$A_1 = |0.44 \quad 0.22 \quad 0.44 \quad 0.44 \quad 0.41 \quad 0.44|$$

$$A_2 = |0.001 \quad -0.92 \quad 0.001 \quad 0.001 \quad 0.37 \quad 0.001|$$

(3) Calculate main components and evaluate.

$$Z_1 = 0.44X_1 + 0.22X_2 + 0.44X_3 + 0.44X_4 + 0.41X_5 + 0.44X_6$$

$$Z_2 = 0.001X_1 - 0.92X_2 + 0.001X_3 + 0.001X_4 + 0.37X_5 + 0.001X_6$$

Solve:

$$\text{For channel 2006 year} \quad Z_1 = 11.49 \quad Z_2 = -0.39$$

$$\text{For channel 2007 year} \quad Z_1 = 11.28 \quad Z_2 = -0.44$$

$$\text{For channel 2008 year} \quad Z_1 = 11.17 \quad Z_2 = -0.89$$

Upon that, enterprise marketing channel value evaluation collective model is:

$$V = 0.83Z_1 + 0.14Z_2$$

Substitute Z_1, Z_2 in different years separately in the collective model above, we get:

$$V_1 = 9.845$$

$$V_2 = 9.3$$

$$V_3 = 9.15$$

It is obvious that, during the years 2006, 2007 and 2008, the marketing value of this enterprise has changed, and had declined every year, that is: the marketing value of this enterprise has dropped from 9.845 in year 2006 to 9.15 in 2008, $V_1 > V_2 > V_3$. Although the fall was small, in 2006 and 2007, separately drop 2% and 3.5%, the decline of the marketing value of this enterprise is the integrated representation of the situation that all aspects of the channel have problems, meanwhile, it is also the sign that the channel must be adjusted. Therefore, the enterprise should find out the causes of the decline of the marketing value of this enterprise, adjust the channel, and ensure the continuous upvaluation of channel on the base of fulfilling the primary channel's value.

5. Conclusion

Evaluating the enterprise channel value by principle component analysis is not only suitable for vertical channel comparison but also suitable for lateral channel comparison, and can not only selectively evaluate various channel plan but also evaluate the current channel value. So, this model provide simple and practical method for the enterprise to make right choice and adjust the channel correctly. This method applies to all the enterprises. When use this method, different enterprise should firstly adjust the evaluation indicator from the practical situation, and according to the channel value evaluation target, and secondly scientifically and rationally chose and the personal component should make sure the primary data obtained for marking is true, reliable and representative.

References

- Ding, Chuanyong. (2007). The Assessment and Selection of Suppliers Based on Principal Component. *Modern Logistics*, (1).
- Han, Lijiao. (2006). The Construction of Assessment Indicators System of Marketing Channels. *Business Research*, (8).
- Li, Xiao. (2009). Performance Assessment of Enterprise Marketing Channels Based on AHP and Fuzzy. *Pioneering with Science & Technology*, Monthly, (3).