

The Research on SPA Distribution Channel from the Perspective of International Supply Chain Environment

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Abstract. In the context of economic globalization, the environment of distribution industry has changed in essence. The rapid development of e-commerce based on Internet information technology has changed and even subverted the production and sales model of products. Personalized and diversified consumption characteristics have become the new common things. Based on the consumer demand, this paper studied SPA distribution channels and constructed a unique supply chain. On the basis of summarizing previous studies, this research used analytic hierarchy process to confirm the weights and used the empirical study to prove practicality of the index system and model.

1. Introduction

SPA(Specialty retailer of Private label Apparel) model refers to a business model in which clothing enterprises have their own brands, and the head office is responsible for the planning of clothing, product design, purchase of raw materials, production and sales of commodities, which is highly vertical and unified in the supply chain. Specialized stores centered on textiles and clothing are pioneers in the internationalization of retail. Moreover, because the internationalization of specialized stores adopts more standardized ways, it is easy to apply the research methods of internationalization of manufacturing industry.

2. Evaluation Index Selection of SPA Format in International Supply Chain Environment

Under the background of economic globalization, SPA mode takes meeting consumer demand as the primary goal, which can effectively connect consumers and suppliers, and connect the procurement, production and retail links of enterprises. Through the innovation of supply method and supply chain process, it can achieve rapid response to the market. Under the international supply chain environment, the evaluation index selection of SPA format is the basis of constructing the evaluation system.

In the international supply chain environment, the research of SPA format mainly focuses on consumer demand, procurement, production and retail. In this paper, 35 evaluation indexes with high occurrence frequency are preliminarily selected through the frequency statistics of evaluation indexes of SPA business form research at home and abroad. Professional shops are studied from the perspective of supply chain, and the indexes are modified according to the investigation of enterprise evaluation personnel, in an attempt to establish a set of applicable index system.

This paper conducted two questionnaire surveys. In the first survey questionnaire, namely the expert questionnaire, industry experts, university teachers and leaders of well-known enterprises were invited to score the importance of indicator factors according to the designed expert questionnaire. According to "unimportant, slightly important, relatively important, very important and most important", experts set scores of 1, 3, 5, 7 and 9 respectively for the importance of major indexes. A



preliminary survey of the importance of subdivision index under the five major indexes of the clothing SPA model in the international supply chain environment was completed.

In the first survey, 18 questionnaires were issued and 15 were recovered. After statistical sorting of the questionnaire results, 35 indicators were obtained. In this paper, SPSS22 was used to process the data in order to identify the key factors affecting the clothing SPA. It can be determined that these 15 factors are the main factors affecting SPA enterprises in the international supply chain environment, as shown in table 1:

Table 1. Factor Variances and Weights Table

Factor	Characteristic Roots	Variance ratio %	Cumulative Contribution Rate %	The Weight
Business Circle	17.694	17.091	17.091	0.172043638
Brand Management	13.688	13.221	30.312	0.133092196
The Regional Economy	12.409	11.985	42.297	0.120656127
Location	9.583	9.256	51.554	0.09317815
Commodity Combination	9.350	9.031	60.585	0.090912627
Price	7.749	7.485	68.070	0.075345662
Regional Culture	6.772	6.541	74.611	0.065846022
Visual Identification	5.549	5.359	79.971	0.053954456
The Service Level	4.659	4.500	84.471	0.045300741
Image Recognition	4.079	3.940	88.411	0.039661241
Sales Promotion	3.222	3.112	91.524	0.031328394
Experience Marketing	2.969	2.868	94.392	0.028868405
Demographic Factors	2.082	2.011	96.403	0.02024386
Flow of Customer	1.876	1.812	98.215	0.018240865
Concept Identifying	1.165	1.126	99.341	0.011327616

3. The Construction Process of the Evaluation Index System of SPA for SPA Format in the International Supply Chain

The second questionnaire compares the relative importance of primary and secondary indicators. This paper conducted research on the five departments of marketing, production, sales, purchasing and management of two typical private brand chain enterprises, and scored the proportion relationship between SPA indexes in pairs under the international supply chain environment from their perspective.

3.1. Questionnaire Distribution and Recycling

This questionnaire was conducted by the staff of the Marketing Department, production department, sales department, purchase department and management department of private brand chain enterprises. A total of 12 questionnaires were issued and 11 valid questionnaires were collected, reaching 90%.

3.2. The Data Analysis

In order to ensure the effectiveness of the results of the questionnaire, the results of the questionnaire were analyzed.

3.2.1. The reliability analysis

The questionnaire data were analyzed by SPSS22, and Cronbach's alpha was 0.872. The higher Cronbach's alpha coefficient is, the higher the reliability is. When the Cronbach's alpha coefficient is greater than 0.6, the higher the reliability is. It can be seen that this questionnaire has a high reliability and the results are reliable.

3.2.2. Validity analysis

Further statistical test was conducted on the questionnaire. KMO value and Bartlett test showed that KMO=0.736 and KMO value was greater than 0.5, indicating that the questionnaire was effective and

suitable for AHP analysis. The significance of Bartlett sphericity test is 0.000, less than 0.001, and this questionnaire is valid.

This questionnaire has reached the design specification, so the data collected and processed according to this questionnaire can objectively reflect the needs of customers. These 15 factors are classified into five categories: retail mix, specialty store management, business environment, specialty store design and specialty store location.

3.2.3.Determination of index weight based on AHP

Based on the analysis results of questionnaire data, this part constructs the evaluation index system of SPA format in the international supply chain environment. Based on AHP, the index weight is calculated to determine the important indexes affecting SPA, providing a basis for the study of SPA formats in the international supply chain environment.

3.2.3.1. Evaluation index system

Based on the analysis of questionnaire data, this part constructs the evaluation index system of SPA format in the international supply chain environment. Based on AHP, the index weight is calculated to determine the important indexes affecting SPA, providing a basis for the study of SPA formats in the international supply chain environment. According to the survey results of SPA indicators and the results of the first expert survey questionnaire, 15 factors were classified and named into 5 categories: retail mix, professional store management, business environment, professional store design and site selection.

3.2.3.2.Evaluation model and construction of judgment matrix

The general target layer A is composed of subsets B1, B2, B3, B4 and B5. B1 is composed of C11, C12 and C13, that is, $B1=\{C11, C12, C13\}$. Similarly, B1 is composed of B2, B3, B4 and B5. See figure 1.

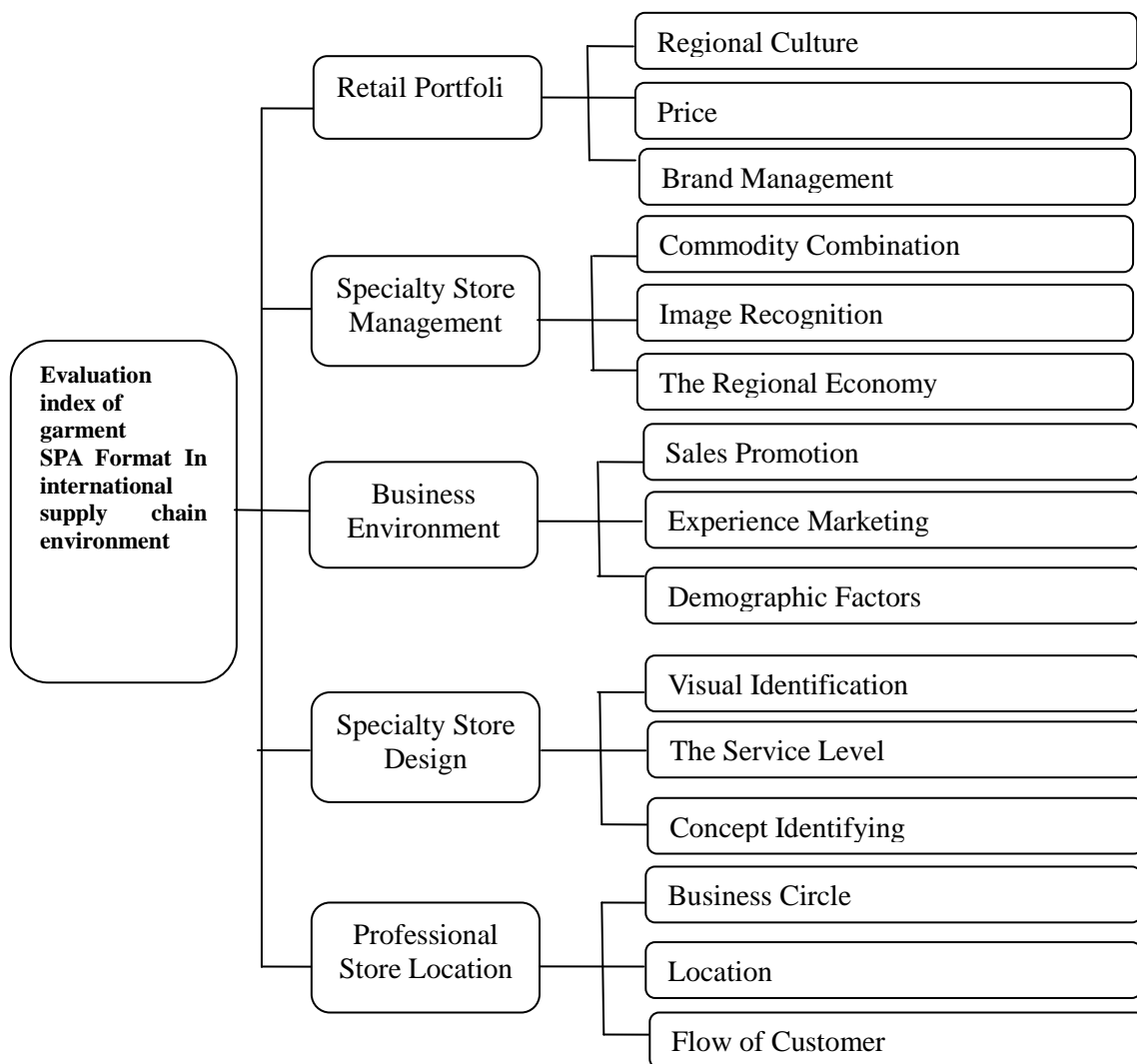


Figure 1. Evaluation Index Level of SPA Format in the International Supply Chain Environment

3.2.3.3. Consistency test and index weight determination

After the scores of 12 experts, a matrix is established. Among them, the consistency ratio of evaluation index A of SPA format in the international supply chain environment: 0.0148; Weight of "evaluation index A of SPA format in the international supply chain environment" : 1.0000; Lambda Max: 5.0341.

According to the weight ordering, the first layer is a very important layer, that is, the weight value is greater than 0.1, and they are C51 and C13 respectively. The second level is the important level, that is, those with weight value between 0.05 and 0.1 are C52, C21 and C11, respectively. The rest are the third level with weight value between 0.05 and 0.02, and the fourth level with weight value less than 0.02, the general level.

Table 2. Ranking Weights of Factors in Scheme Layer to Decision Objectives

Plan	The Weight	The Sorting
Business Circle C51	0.2314	1
Sales Promotion C13	0.1601	2
Experience Marketing C23	0.1232	3
Location C52	0.0712	4
The Service Level C21	0.0611	5
Price C12	0.0534	6
Commodity Combination C11	0.0503	7
Regional Culture C41	0.0446	8
Image Recognition C42	0.0428	9
Brand Management C22	0.0411	10
The Regional Economy C31	0.0373	11
Visual Identification C32	0.0301	12
Demographic Factors C33	0.0223	13
Flow of Customer C53	0.0178	14
Concept Identifying C43	0.0133	15

4. The Empirical Research

X clothing enterprise, with an international advanced clothing production line, mainly operates in the form of professional shops at home and abroad, has great popularity and market space in the international market. In this paper, six specialized stores of the clothing enterprise are summarized and counted according to the operation data that lasts for half a year before and after the countermeasures are taken according to the evaluation index weight of the clothing SPA format.

4.1. Regression Model of Dummy Explanatory Variables

If there is a significant change in sales volume before and after the introduction of dummy variables to explain the change of countermeasures, the explanatory variables have only two mutually exclusive qualitative variables and no regression of quantitative variables. Therefore, the variance analysis model is set, with the type as follows:

$$Y_t = aD_t + b + u_t \quad (1)$$

Where, Y_t is the operating quota of X enterprise in month t (yuan), D_t is the dummy variable; And the game changes, the game doesn't change.

The significance of formula (1) is that, assuming that other factors remain unchanged, it studies whether there is a difference in regional express turnover before and after the change of strategy. When the classical hypothesis is satisfied, formula (1) can be written:

Average monthly operation without countermeasures:

$$E(Y_t | D_t = 0) = b \quad (2)$$

Average monthly operation after the change of countermeasures:

$$E(Y_t | D_t = 1) = a + b \quad (3)$$

That is, in formula (1), intercept term b gives the average monthly operation amount of the unimplemented game, while another coefficient indicates the part that changes the average monthly operation amount of the game is different from the average monthly operation amount of the unchanged game, which can be obtained from formula (2) and formula (3). The left and right of dummy variable is to change the intercept level of the set model.

To test whether there is a significant difference between the average monthly operation of the unchanged game and the changed game, we can construct a hypothesis that there is no difference

between the changed game and the monthly operation. For the regression of formula (3), the acceptance or non-acceptance of hypothesis can be judged according to whether the t-test of the estimated value is significant.

4.2. Regression Analysis of Monthly Operating Income

Regression analysis was made on the sales volume of 9 consecutive months before and after the implementation of countermeasures by 9 professional stores of X enterprise. Since the t test of each coefficient is greater than 2, it indicates that the coefficient of each explanatory variable is significantly different from 0, which indicates that the regression equation of the change in countermeasures to the monthly operating amount is indeed different in statistical significance. Regression results are summarized in table 3:

Table 3. Regression results

parameter	Speciality Store					
	A	B	C	D	E	F
DI	632.5500	3013.600	1322.750	4028.700	674.2500	4033.250
	t=(2.3147)	t=(2.3325)	t=(2.2143)	t=(3.9935)	t=(2.1875)	t=(3.1473)
	p=(0.0514)	p=(0.0214)	p=(0.0614)	p=(0.0052)	p=(0.0416)	p=(0.0196)
C	5421.300	9420.500	12131.45	15001.70	5660.75	18132.70
	t=(2.1322)	t=(18.7188)	t=(25.1467)	t=(21.1463)	t=(30.7427)	t=(19.3124)
	p=(0.0000)	p=(0.0000)	P=(0.0000)	p=(0.0000)	p=(0.0000)	p=(0.0000)

Through the above table, it can be concluded that the change of countermeasures does have a positive effect on the monthly operation volume of various regions, and it also has certain reference significance for other professional stores and enterprises.

5. Acknowledgement

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