

Evaluation on the International Competitiveness of Japanese Culture Industry

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Abstract

This paper researches on the strategy of Japanese culture industry, and makes analysis on the achievements of the implementation of the strategy as well as the problems that it is encountered with, and reckons that the strategy has achieved great results, and has gained widespread influence. Based on the characteristics of the competitiveness of the Japanese culture industry, it selects 18 indicators to build the evaluation index system for the competitiveness of the Japanese culture industry; and makes the competitiveness evaluation on the Japanese culture industry, so as to test the reliability of the model. The model can be applied as a scientific approach to determine the regional positioning of the culture industry, and to provide a scientific foundation for the formulation of the appropriate development strategy for the culture industry.

Key words: JAPANESE CULTURE INDUSTRY, INTERNATIONAL COMPETITIVENESS; EVALUATION MODEL, INDEX SYSTEM

1. Introduction

The position of the output of the culture industry has become increasingly important in the international relations; the better a country's culture industry develops, the greater room for development there is for the country to enhance its soft power. In the beginning of this century, Japan put forward a strategy of culture industry power nation, and Japan is the first country to implement the culture industry power nation strategy in Asia and has made a corresponding successful example [1]. Japan's successful experience in the culture industry in Asia is worthy of the in-depth research and reference by all the countries in Asia. In 2010, in the "Content Industry Revitalization Policy - National Strategy at the Era of Soft Power" which was published in 2010, Japan clearly put forward the target to build Japan into the first intellectual property great power in the world within 10 years. In 2012, Japan's Cabinet Intellectual Property Strategic Af-

fairs Bureau declared the "2012 Intellectual Property Strategy Plan", and in 2013 it formally established the "Culture Industry Power Nation Strategy". These decisions have gained success in practice in succession; especially its "Comic and Animation" effect, which has created a stunning impact in the whole world [3].

In respect of the research on the competitiveness of the culture industry, Jacquemin et al has made in-depth systematic analysis and discoursed upon the significance of the competitiveness of the culture industry and the core competence of the culture industry, as well as the international pattern, the regional integration, and the enhancement of the strength of the culture industry and development strategies [4]. Ciampi et al based on the factors of five essential elements including production, demand conditions, related auxiliary industries, cultural enterprise strategy, and the government acts as the fundamental content, and established a comprehensive evaluation indica-

tor system that covered 17 competition aspects and 67 competitiveness evaluation indicators to reflect the competitiveness of the national culture industry comprehensively, to have a relatively comprehensive and accurate evaluation on the overall competitiveness of the culture industry and the main industrial competitiveness situation from the national level [5]. Cheshire et al started from the research on the theoretical basis of the industrial clusters and models, and presented the competitiveness evaluation model on the regional comparative advantages of the Japanese culture industry [6]. However, the results of the aforementioned studies have yet to clearly put forward a concrete method with strong operability, and have emphasized on the qualitative research, especially there was no clear proposal for the specific method on the determination of the weight of indicators. In this paper, the competitiveness evaluation index system for the Japanese regional culture industry is proposed, and such quantitative research method not only can facilitate the transition of cultural undertaking to culture industry at the technical level, but also can be applied as a scientific method to determine the positioning of the regional culture industry, so as to provide a scientific basis for each region to develop an appropriate development strategy for the culture industry.

2. Connotation of the strategy of Japanese culture industry power nation

The strategy of Japanese culture industry power nation can be summarized and defined as the following: "Japanese government implements the export of the culture industry to foreign countries, so as to achieve the target of improving the economic and political interests of the country, and develops a set of strategy for foreign cultural exchange and propaganda to deepen the understanding of all other countries to the Japanese culture." Despite the wide praise that the Japanese popular culture and lifestyle (Japanese fashion apparel, food, animation, daily necessities, traditional crafts, etc.) has gained in the international community and has also been highly respected, Japan has yet to become a power nation of culture industry. Therefore, the Japanese government must link the cultural resources with the latest technological development and social development, so as to make it possible to maintain the long term vitality of the culture industry. In the "Strategy of Japanese Culture Industry Power Nation" and the relevant policy documents, the Japanese government has proposed a number of practical policies, which can be summarized in the following main aspects:

2.1. To Create the Globalization of Talents

Japan is gradually advancing the strategic support

for the globalization of professionals in the creative industry. In order to attract international talents, the Japanese government has made the arrangement of temporary residency which is required for foreign creators. Meanwhile, it has cooperation with Asian countries and regions such as Singapore, India, Hong Kong and others to provide a space for young creators to publish works and take active part in. It has interaction and communication with Asian creators and designers, and expands the joint network with the university students who study abroad in Asia and Oceania and the Waseda University.

2.2. To Implement Projects in the Foreign Country

Currently Japan has implemented a number overseas projects with broad range, the modern enterprises and distribution industry join hands to create products in the areas of fashion, diet, housing, local products, traditional handicrafts and other fields, and to create the products in these areas into the major commodities of Japan's overseas development project.

2.3. To Establish Appropriate Mechanism to Achieve the Maximization of Profits

Currently, Japan's plan is to seize the global market of 8-11 trillion yen. Therefore, how to achieve this goal, the Japanese government believes that it should make adjustment in the following three stages. Firstly, to widely publicize the culture industry, such as the creation of fashion, food and tourism project of the Japanese origin with the Japanese upsurge for overseas consumers through foreign media. Secondly, to create a local mechanism to obtain profits through the sales of the products and the provision of services, such as shops, EC, television shopping and other distribution projects. Thirdly, to establish propaganda mechanism in Japan, and invite "meccas", the Japanese followers, to have more consumption in foreign countries.

2.4. To Provide Sufficient Risk Capital: Content Fund and Creative Fund

"Cool Japan" films, animation, TV programs, games, books, etc. are highly appreciated abroad, however, the ratio of exports abroad accounts for only 5% which has yet to meet the growing demand of Asian countries in recent years. Meanwhile, the foreign export ratio of American culture industry is 17.8%, which is about three times of Japan, and the sales of home video game software accounts for more than 97% in the export industry. In order to enter the global markets including Asian countries as well as the American film market, Japan has taken the development of the gateway as a shortcut. The industrial innovation agency is initially funded by the new com-

pany All Nippon Entertainment Works with the 100% investment to provide sufficient funding.

2.5. The National Government Plays an Important Role to Make the Necessary Strategic Deployment

As the country's leading institution, the government should play the important role of decision making, and make the necessary strategic deployment for the economic expansion abroad. This includes the considerations in the aspects of the following: Firstly, as shares are in an important position in the country, all the ministries and agencies shall act as a whole and have cooperation, such as strengthening the strategic cooperation, attracting more tourists and exporting Japanese food to other countries; Secondly, to introduce the Japanese brands, culture and lifestyle comprehensively; Thirdly, to create a new incubation system, and collaborate with small and medium enterprises, global head of human resources and provide public and private risk currencies. Fourthly, develop the common infrastructure, such as ensuring the local radio and distribution network. Fifthly, cooperate with other administrative service companies, and combat with the piracy and illegal distribution of materials, loosen up the entry requirements regarding the foreign government needs, and support the localized content industry. And the Japan External Trade Organization shall provide the market information, and develop relevant legal and accounting procedures.

3. The index system of the regional culture industry competitiveness evaluation model

3.1. The Construction Principle of the Index System

In the practical operation, the more deep-seat-

ed the competitiveness is, the more difficult it is to measure directly with the existing indicators, such as the institutional indicators that reflect the industrial policy and the environment system, are difficult to accurately quantify in a scientific manner in reality. In addition, the operability of the evaluation system should also be taken into consideration, and it would be best if the selected indicators can be obtained directly from a variety of statistical data or acquired after calculation, so that the idealized index system can be realized, and can be treated in a quantitative way. For good indicator in theory, if there is no existing database or measurement instruments and thus cannot be quantified, it should generally be excluded or to find other alternative indicators. The economic meaning of the evaluation indicator should be clear and consistent, and the accounting and integration method should be unified, so as to achieve dynamic comparability, and to ensure the rationality, objectivity and impartiality of the comparative results of the indicators.

3.2. Selection of the Index Data and Construction of the Evaluation System

According to the aforementioned general framework, combined with the actual development of the Japanese culture industry and in consideration of the possibility and scientificity of access to data, the evaluation index system for the competitiveness of the Japanese culture industry is constructed with 18 indicators that reflect the eight competitive aspects (Table 1). These 18 indicators can be obtained through data consolidation and sorting and calculation on the basis of the data enquiry etc.

Table 1. Evaluation Index System for the Competitiveness of Regional Culture Industry

Competitiveness Module	Competition Aspect	Competitiveness Index Name / Unit of Measurement	Weight	Value
Explicit Competitiveness A	Industrial Scale A_1	Regional culture industry added value A_{12} / thousand Yuan	W_1	X_1
		The total output of regional culture industry A_{12} / thousand Yuan	X_1	X_2
	Industrial Efficiency A_2	Regional culture industry fixed asset yield A_{22} /%	W_4	X_4
		Regional culture industry labor return yield A_{22} /%	W_4	X_4
		Regional cultural assets tax rate A_{23} /%	W_5	B_{11}

Basic Competitive B	Industrial Relevance B_{11}	International tourism foreign exchange earnings of the region B_{11} / million US dollars Regional tourist arrivals head count B_{12} / million tourists	W_7 W_7	X_6 X_7
	Industrial Resources B_{21}	Regional per capita cultural heritage protection institutions and museum heritage collections B_{21} / % Regional per capita volumes of public library collection of books B_{23} / volume Locally owned global natural and cultural heritage quantity B_{23} / place Locally owned national intangible cultural heritage B_{24} / item	W_9 W_9 W_{10} X_8	X_8 X_9 X_{11} X_{11}
	Industrial Factors B_3	Cities and towns investment in recreation and entertainment fixed assets proportion of the total investment B_{31} / % Cities and towns employment in the recreation and entertainment proportion of the total urban employment W_{13} / %	W_{13} W_{13}	X_{13} X_{13}
Potential Competitiveness C	Industrial Innovation C_1	Regional art education and science and technology added value proportion of the culture industry added value C_{12} / % Regional cultural research institutions completed number of research projects C_{12} / month	W_{14} X_{14}	X_{14} X_{15}
	Industrial Policy C_{21}	Regional cultural expenses proportion of the total fiscal expenditure C_{21} / %	W_{16}	C_3
	Industrial demand C_3	Regional urban resident household cultural and recreation goods per capita consumption expenditure C_{31} / yuan Regional urban resident household cultural and recreation services per capita consumption expenditure W_{17} / yuan	W_{17} W_{18}	X_{18} X_{18}

3.3. Hierarchical Evaluation Method Based on Clustering Analysis

3.3.1. Cluster Analysis

This section applies the comprehensive evaluation method on the basis of clustering analysis to analyze the Japanese culture industry, and the cluster analysis method is described as below. The principle of cluster analysis lies in the great degree of individual correlation in the same category, while very small degree of individual correlation in the different categories.

The cluster analysis is divided into the variables clustering and the sample clustering, and this section focuses on the application of sample clustering to ex-

ploit the competitiveness of the Japanese culture industry [7]. In the specific calculation that applies the cluster analysis, it is necessary to compare the original data and make the calculation, while the various raw data due to the different units of measurement may affect such comparison and calculation. Therefore, we need to perform dimensionless treatment to the raw data so as to eliminate the influence of the different units of measurement on the values of the data. We apply a standardized method of processing.

Assuming there are m evaluation objects, n evaluation indexes, and the index is x_1, x_2, \dots, x_n respectively, the raw data of the i -th evaluation object for the

j -th index is x_{ij} ($i = 1, 2, \dots, m; j = 1, 2, \dots, n$), that is, the original data matrix is $X = (x_{ij})_{m \times n}$.

In the matrix $X = (x_{ij})_{m \times n}$, let

$$y_{ij} = \frac{x_{ij} - \bar{x}_j}{s_j} \quad (1 \leq i \leq m, 1 \leq j \leq n)$$

Where, the mean of the sample is

$$\bar{x}_j = \frac{1}{m} \sum_{i=1}^m x_{ij}$$

The mean variance of the sample is

$$s_j = \sqrt{\frac{1}{m-1} \sum_{i=1}^m (x_{ij} - \bar{x}_j)^2}$$

Matrix $Y = (y_{ij})_{m \times n}$ is called the standardized matrix

After the raw data is subject to normalization processing, the mean of the sample in the standardization matrix is 0 and the variance is 1, which has eliminated the influence of quantities and dimensions, meanwhile the standardization method also eliminates the variability of the difference in the indexes, therefore, after the data is subject to the normalization treatment, it cannot contain all the information in the original data, resulting in the huge deviation of the results in the comprehensive evaluation from the actual situation.

Clustering statistics is through the non-dimensional treatment of the raw data and the new data obtained after calculation [8-9]. It is used to illustrate the degree of closeness of the correlations between the samples or indexes. We make use of the distance clustering statistics, and regard the observation value of each sample as a point in the P-dimensional space, so that the degree of similarity between two samples can be measured from the P-dimensional space. The smaller the distance is, the higher the degree of similarity will be, and the two samples should be classified as one cluster.

$$d_{ij} = \left[\sum_{k=1}^p (y_{ik} - y_{jk})^2 \right]^{\frac{1}{2}}$$

3.3.2. Evaluation Method Procedure

Comprehensive evaluation method is applied based on the cluster analysis, namely by calculating the comprehensive competitiveness index of the culture industry, to determine the level of competitiveness of the regional culture industry. The comprehensive index of the culture industry competitiveness is a reflection of the integrated value of the competitiveness of the culture industry in a certain period at a region. The higher the comprehensive index is, the stronger the competitiveness will be. It is com-

parable in time and space. When compared in space, the relative strength of the different regional culture industry competitiveness can be analyzed; compared with different times, it can reflect the changes in the competitiveness of the regional culture industry.

The specific operating steps are as follows.

a). Standardization Process for the Index Data

Apply differential conversion on the 18 indicators data for each region, and carry out the standardization process, so as to eliminate the dimension

$$I_{ij} = 100 \times \frac{X_{ij} - \min(X_j)}{\max(X_j) - \min(X_j)}$$

Where: I_{ij} is the j -th indicator standardized result in the i -th region; X_{ij} is the j -th indicator data in the i -th region; $\min(X_j)$ is the minimum of all samples of the j -th indicator; $\max(X_j)$ is the maximum of all samples of the j -th indicator. The data after conversion has the unified dimension, with the maximum value of 100, and the minimum value of 0; and all data is changing between 0 and 100. Its geometric meaning is to move the coordinate origin to the maximum (minimum) value, while with its degree of correlation between variables constant.

b). The Weight Determination of the Model Index

Adopting the analytic network process (ANP) so as to scientifically determine the index weight [7], the aforementioned elements of the index system are divided into two categories: The first category is the control element layer, including those objectives of issues (competitiveness of regional culture industry) and decision criteria (A explicit competitiveness, B basic competitiveness, C potential competitiveness), and all decision making criteria are considered independent of each other, and only subject to the control of the target element, and all the weight of each criteria in the control layer is obtained by the application of the traditional method of AHP; The second category is the network layer, which is composed of all the elements set of indicators that is governed by the control layer, that is, the 8 competition aspects (A_1 industrial scale, A_2 industrial efficiency, C_1 industrial correlation, B2 industrial resources, B3 industrial elements, C_1 industrial innovation, industrial policy, and A_1 industrial demand) and 18 indicators, and its internal structure is a network with interrelated influence. In accordance with the principle of analytic network process, by the application of the Super Decision software, with the three criteria indicators of the control layer (A, B, C) as the determination criteria, make pair-wise comparison on the elements set indicators ($A_1, B_3, B_3, B_3, B_3, C_3, C_3$), according to the opinions of experts, to establish the judgment

matrix, and to determine whether to accept the matrix with the test results of consistency, and then further determine the weight value of each element set of indicator by the weighted hyper matrix. Next, take the element set of indicators as the judgment standard, and consider the relationship between the model indicators, establish the judgment matrix based on expert opinion, to determine whether to accept the matrix with the test results of consistency, and determine weight value of each index by the extreme ultra matrix. Implement the ANP weighting process on the network layer indicators, then the corresponding weights of three competitive modules can be further determined with the AHP method as follows: The weight value of the explicit competitiveness module A is 0.412, the weight value of the basic competitiveness module B is 0.301, and the weight value of the potentially competitive module C is 0.287; the weight value of industrial scale A_2 and industrial efficiency A_2 are 0.263 and 0.149 respectively; and the weight of industrial correlation B_2 , industrial resources B_2 and industrial elements B_3 are 0.077, 0.116 and 0.108 respectively; the weight of industrial innovation, industrial policy and industrial demand are 0.106, 0.082 and 0.099 respectively.

c). Implementation of the Mean Processing for the Indicators Data, and Calculation of the Distance be-

tween Groups

Apply the cluster analysis standardized dimensionless equation as mentioned in the last section to perform the mean processing on the indicator data, and then use the distance statistic value to make distance calculation.

d). Establishment of Evaluation Model

After the completion of the processing of the indicator data and weight, the competition aspects, competitiveness modules and comprehensive competitiveness index can be calculated in succession, and the comprehensive evaluation model can be constructed as follows:

$$A_i = \sum_{k=1}^5 W_k I_{ik}$$

Where: A_i is the i -th culture industry competitiveness module data; I_{ik} is the k -th standardized result of the i -th index; W_k is the weight of the k -th index.

4. The empirical demonstration of the competitiveness of the Japanese culture industry

According to the raw data of each evaluation index of Japan collected in 2014, adopt the SPSS software to standardize the data. Make use of the factor analysis herein, to obtain the KMO detection and spherical hypothesis detection results as shown in the table below.

Table 2. KMO Test and Spherical Hypothesis Test Result

KMO detection	0.715	
Spherical Detection	Approx chi-Square	658.700
	df	201
	Sig	0.000

Table 3 shows the result after rotation of the factor loading matrix in accordance with the maximum value method of the variance. Before the rotation of the matrix factor variables, most variables have certain load, its actual meaning is not clear enough, however, by rotation, the meaning of all its four factor variables become relatively clear. After factor analysis after the structural relationship of the 15 indicators in the factor loading matrix after rotation is derived through factor analysis. Therefore, the load value of each index is:

$$\begin{cases} F_1 = 0.925_{x_8} + 0.919_{x_9} + 0.895_{x_7} + 0.773_{x_{13}} + 0.686_{x_{12}} \\ F_2 = 0.894_{x_1} + 0.893_{x_2} + 0.701_{x_5} + 0.523_{x_6} \\ F_3 = 0.818_{x_{11}} + 0.691_{x_{10}} + 0.681_{x_3} \\ F_4 = 0.931_{x_4} + 0.862_{x_{14}} + 0.596_{x_{15}} \end{cases}$$

Through the above formula, $W_i = \frac{\lambda_i}{\sum_{i=1}^m \lambda_i}$ makes

analysis on the normalization of the weight of the four main factors, and obtain $W_2 = 0.242$; $W_2 = 0.242$; $W_3 = 0.209$; $W_4 = 0.198$. And in accordance with the score of the weight and each factor score to simulate the evaluation of the competitiveness of Hebei culture industry:

$$F = 0.351F_1 + 0.242F_2 + 0.209F_3 + 0.198F_4$$

In equation (3), F is the comprehensive score of the competitiveness of the Japanese culture industry.

5. Conclusion

This paper studied and explored the international competitiveness analysis on the Japanese culture industry, adopting the comprehensive evaluation model for the culture industry competitiveness evaluation based on cluster analysis method, and made evaluation on the Japanese culture industry. The test results show that evaluation model for the competitiveness of the culture industry can make effective evaluation on the competitiveness of the culture industry, which also effectively proves the feasibility and effectiveness of this model.

Table 3. Factor Loading Matrix after Rotation

	Main Factor			
	1	2	3	4
X1	0.302	0.9170	0.071	-0.160
X2	0.351	0.889	0.051	-0.108
X3	-0.029	0.052	0.679	0.321
X4	-0.024	-0.130	-0.068	0.931
X5	0.276	0.721	0.238	0.236
X6	0.315	0.583	0.446	0.339
X7	0.889	0.169	0.118	0.272
X8	0.919	0.226	-0.103	-0.007
X9	0.921	0.167	0.249	0.140
X10	0.560	-0.322	0.691	0.022
X11	0.209	0.289	0.818	-0.005
X12	0.686	0.314	0.558	0.003
X13	0.773	0.355	0.376	0.017
X14	0.107	-0.122	0.130	0.862
X15	0.169	0.155	0.265	0.596

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