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## Construction and Measure of the Evaluation Index System of Regional Soft Power - Taking Shandong Province as an Example

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### Abstract

Based on the concept and connotation of regional soft power, combined with the actual situation of the economic and social development in Shandong Province, this paper builds a strong operational regional soft power rating index system. Using the data of the Statistical Yearbook of the 17 cities in Shandong Province in 2008, z-score standardized methods and factor analysis and so on, finally the paper have a comprehensive evaluation and analysis about the status quo of regional soft power of the 17 cities in Shandong Province.

**Key words:** Regional soft power; Evaluation index system; Factor analysis

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### INTRODUCTION

Nowadays the competition in the world is the competition of comprehensive national strength, which not only includes the strength bout of the economic, political, military, also contains the intense competition of culture, science, technology and education and so on. Soft power is the economic growth's relative index, it is a sign of the level of development of a country in terms of scientific,

educational, cultural, and legal environment. The first proposed concept is soft power in foreign and domestic, when the country's soft power concept specifics to a certain region, the concept of regional soft power appears. You can use the index of regional soft power Judging the status of a region's economic development, also this index can be used for comparison between the different regions, of course the premise is building a more reasonable evaluation index system.

Shandong province's GDP in 2011 ranked third in the country, as a major economic province, the role of soft power is particularly important, using the built index system of regional soft power to measure and compare the soft power of the 17 cities in Shandong province, and then makes appropriate advices to promote the soft power, thus contributing to the economic development of Shandong province.

## 1. THE CONCEPT AND ELEMENTS OF REGIONAL SOFT POWER

### 1.1 The Concept of Soft Power

The concept of regional soft power stems from the concept of national soft power in the level of international relations, and is the application and extend of national soft power in the level of regional competition and development. The more authoritative definition of the concept comes from "the theory and practice of regional soft power", published in 2007. In this book, regional soft power is defined as "In the regional competition, the power sum of the regional government's credibility, the regional social cohesion, the charisma of characteristic cultural, the residents' creativity and the attraction to the outside of the region established in the top of the non-material elements of regional culture, government public service (service system and service behavior), human qualities (the quality of residents)".

## 1.2 The Elements of Regional Soft Power

According to the above definition, the majority of scholars think regional soft power elements include four aspects: regional culture, human quality, the image of the region and public services. The elements of regional soft power in this paper adds the element of technological innovation in addition to the above four aspects.

### 1.2.1 Regional Cultural

Due to the difference of geographical environment and natural conditions, historical and cultural background are different, every region forms the cultural characteristics relating to the location, this culture is the regional culture.

The cultural history of Shandong province has a long time, and gradually have formed a kind of “self-reliance, respect for integrity, selfless and hard-working wisdom” Qilu culture. This paper mainly uses the physical state of the culture, such as cultural buildings and cultural sites on behalf of the regional culture.

### 1.2.2 Human Quality

Human quality is the comprehensive level of the population within the region in a certain period, such as ideological and moral, intellectual, physical, scientific and cultural level. The level of the human quality Determines the human resources’ innovation, and radically restrict the role of regional soft power.

### 1.2.3 Regional Image

Regional image means the overall image of residents, cultural landscape and development image in an area. This element have a more important influence and attractiveness to the region outsides, is particularly conducive to investment, and will help promote the development of tourism and other industries in this region, its role can not be replaced by the other elements.

### 1.2.4 Public Service

Public service is the functional activities which can meet the direct needs, such as some sort of civic life, survival

and development, make citizens benefit or enjoyment. Benign public services can promote the credibility of the government, social cohesion and entrepreneurial creativity, attract a lot of funds and investors, and create a favorable environment for the development of the social, economic and quality of life.

### 1.2.5 Technological Innovation

Technological innovation is technical activities which improve existing products or creating new products, production processes or service mode. The major technological innovation will lead to a fundamental shift of the socio-economic system. With the development of economic, technological innovation plays more and more important role in economic progress of a region. Technological innovation can produce new technologies, new products, finally the application of new technology and the sales of new product can promote the economic development of the region.

## 2. THE BUILDING OF THE EVALUATION INDEX SYSTEM OF REGIONAL SOFT POWER

### 2.1 Design of the Index System

According to the elements of regional soft power, its evaluation system is constituted by three indicators: one class index is the composite index of regional soft power, it reflects the comprehensive level of some area’s soft power in a certain period, which consists of five Secondary indexes, namely the regional culture, the human quality, the regional image, public services and technical innovation, Secondary index sets three-level index. In addition, all indexes are positive indexes. The index system of Shandong province’s regional soft power shown in Table 1.

**Table 1**  
**The Index System of Shandong Province’s Regional Soft Power**

one class index	Secondary index	three-level index
regional soft power	regional culture	the number of Cultural institution
		the number of library
		the number of museum
	human quality	the number of General university
		the number of R&D personnel
		the enrollment rate of school-age children
	regional image	the proportion of the number of graduation
		the number of incoming passenger
		the total value of exports
	public services	the number of application for a patent license
		the number of star grade hotel
		the number of health agency
technical innovation	the rate of Cable TV households	
	the number of public buses and trams Per million people	
	internal expenditures of R&D activities	
		full-time equivalent of R&D personnel
		the number of patent license
		the number of scientists and engineers
		FDI

## 2.2 Data Sources

The data come from “the Statistical Yearbook of Shandong Province 2009 “,” Shandong Science and Technology Statistics Yearbook 2009 “and the Statistical Yearbook of 17 cities in Shandong Province.

## 2.3 Evaluation Method

Due to the different dimension of three-level indexes, data six to one. In order to eliminate this influence, this paper uses z-score standardization methods to pretreat the original data as dimensionless treatment,

$$\text{New data} = (x - \bar{x}) / \delta$$

Factor analysis is used to determine index weights. Factor analysis transfers the multiple indexes into a few representative general indexes that reflect most information of the original indexes (typically more than 80%), and the various indexes are independent to avoid overlapping information, factor analysis plays the role of dimensionality reduction and simplify the data

structure. In this paper, comprehensive index of the five major aspects of regional soft power is built using factor analysis, respectively, which lays the foundation for measuring soft power.

## 3. COMPREHENSIVE EVALUATION AND ANALYSIS OF SHANDONG PROVINCE’S REGIONAL SOFT POWER

### 3.1 Empirical Analysis of the Evaluation Index System of Regional Soft Power

After dimensionless processing to the raw data of the three indexes, factors composite scores are calculated by factor analysis, based on various factors scores continue to use factor analysis to determine the weights of the various factors, finally calculate the composite score of regional soft power, as shown in table 2.

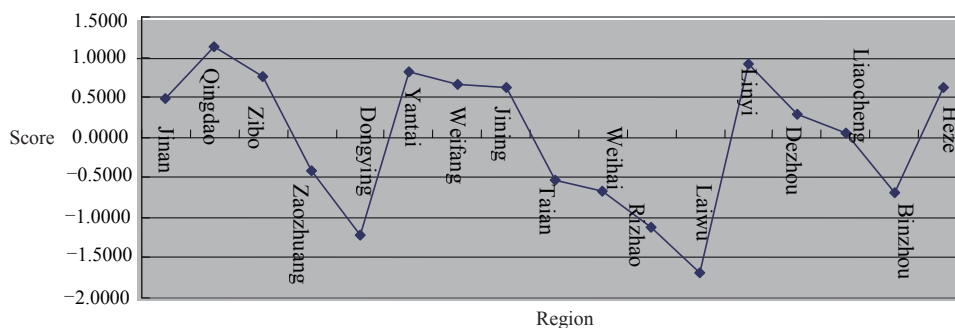
**Table 2**  
**Score of 17 Cities’ Regional Soft Power in Shandong Province**

Region	Regional culture	Human quality	Public services	Regional image	Technical innovation	Comprehensive score
Jinan	0.4842	2.9593	0.8471	0.8463	2.1846	1.5230
Qingdao	1.1333	1.3861	1.9107	2.7432	2.2878	1.9581
Zibo	0.7474	0.0870	0.8479	-0.2451	0.0426	0.2610
Zaozhuang	-0.4138	-0.6636	-0.7833	-0.7505	-0.7956	-0.7013
Dongying	-1.2272	0.0672	0.1382	-0.3830	-0.0198	-0.2231
Yantai	0.8176	0.1432	0.9594	1.2205	0.6520	0.7613
Weifang	0.6625	0.1460	0.2763	0.1149	0.5399	0.3312
Jining	0.6297	-0.3316	-0.0819	0.0889	-0.1506	-0.0074
Taian	-0.5418	-0.1051	-0.7020	-0.1175	-0.3039	-0.3419
Weihai	-0.6694	-0.0402	0.4501	0.4204	-0.1470	0.0468
Rizhao	-1.1248	-0.2987	-0.4608	-0.3326	-0.7436	-0.5612
Laiwu	-1.6836	-0.5733	-1.0060	-0.7077	-0.5912	-0.8588
Linyi	0.9163	-0.4711	0.1933	-0.1911	-0.3102	-0.0328
Dezhou	0.2886	-0.4834	0.3314	-0.6655	-0.7384	-0.2973
Liaocheng	0.0511	-0.5656	-0.9984	-0.6033	-0.4990	-0.5600
Binzhou	-0.6880	-0.5923	-0.4906	-0.6856	-0.5641	-0.5987
Heze	0.6106	-0.6723	-1.4325	-0.7519	-0.8435	-0.7019

### 3.1.1 Regional Culture

According to the scores listed in the above table, the regional culture scores’ line chart of Shandong province is shown in Figure 1. From the line chart, we can see that Qingdao has the highest regional culture score, the lowest score is Laiwu. As the capital city of Shandong province,

Jinan is only located in ninth place, mainly because Jinan has less Cultural institutions, significantly less than the other cities. Jinan should give full play to the advantages of the capital city, and make efforts to improve the development of regional culture by focusing on cultural institutions and building construction.

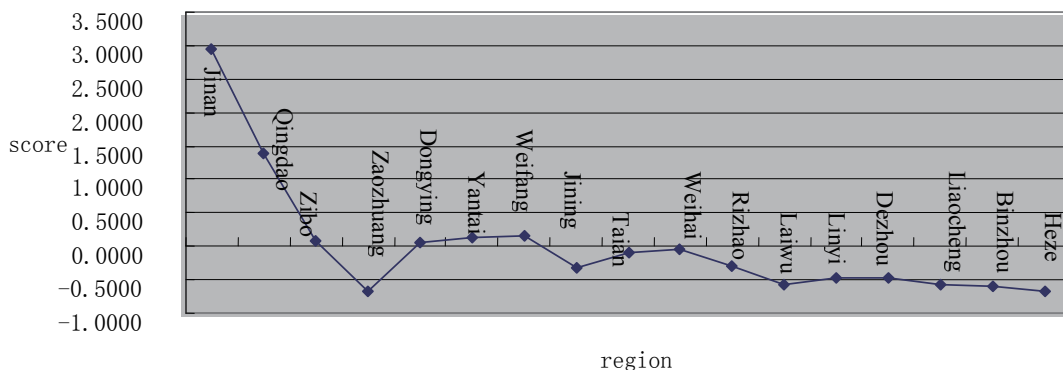


**Figure 1**  
**The Line Chart of Regional Culture’s Score**

### 3.1.2 Human Quality

According to the regional scores of 17 cities in Shandong province in Table 2, the human quality scores' line chart is shown in Figure 2. As we can see from the figure, Jinan's human quality score is far ahead of other cities, mainly because Jinan has numbers of general universities, the proportion of the number of college graduates is large,

and the number of R&D personnel is larger. However, the enrollment rate of school-age children in Shandong Province is relatively close, close to 100%, Binzhou is minimum, reached to 99.51%. The lowest score of the human quality is Heze, which is directly related to the smallest number of the College and the lowest proportion of the number of college graduates.

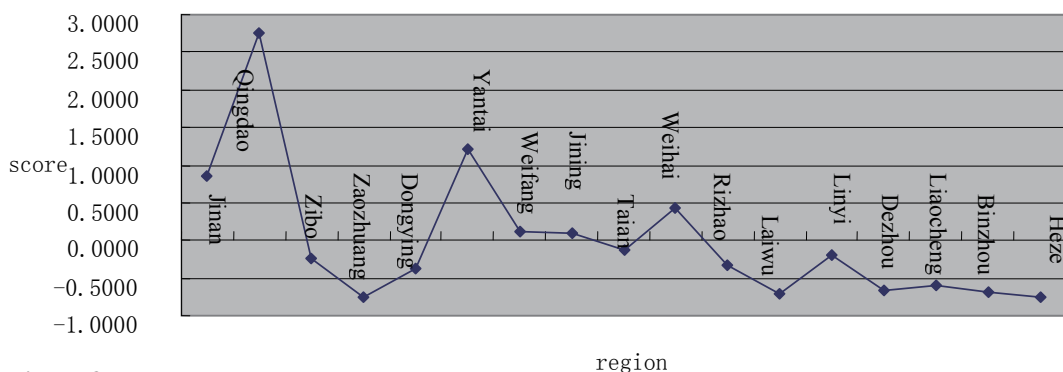


**Figure 2**  
The Line Chart of Human Quality's Score

### 3.1.3 Regional Image

According to the regional scores of 17 cities in Shandong province in Table 2, the regional image scores' line chart is shown in Figure 3. As we can see from the figure, the regional image score of Qingdao is far ahead of the other regions, Jinan is located in third place, and locating in the top, in addition to the provincial capital of Jinan, the rest are coastal cities (Qingdao, Yantai, Weihai). The number of incoming passenger, the total value of exports and the number of star hotels of Qingdao are locating in the first

place, and the number of patent applications authorize is only less than Jinan, located in the second place. Jinan, as the capital city, whose patent application for authorization number is the most, but the development of tourism even is in arrears of Qingdao and Yantai, Jinan should make full use of its own tourism resources, make efforts to do a good job of city publicity to develop the tourism of Jinan. The lowest score of the regional image and is Heze, this region's publicity work needs to be strengthened.

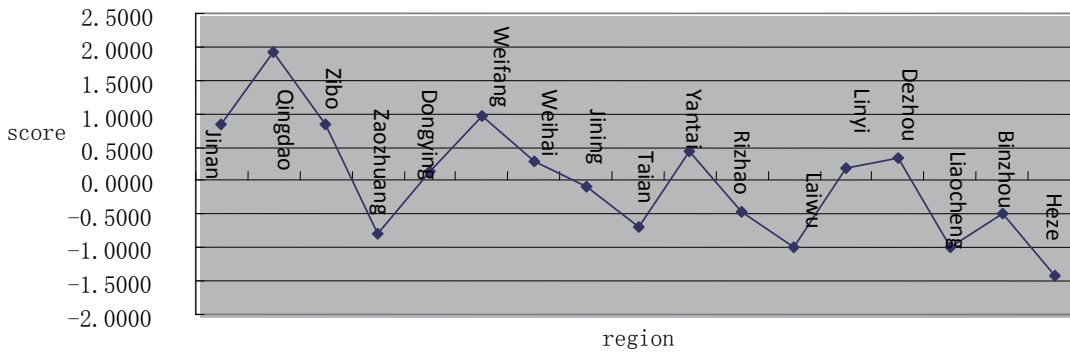


**Figure 3**  
The Line Chart of Regional Image's Score

### 3.1.4 Public Services

According to the regional scores of 17 cities in Shandong province in Table 2, the public services scores' line chart is shown in Figure 4. As we can see from the figure, Qingdao's public services has the highest score, the lowest score is Heze, Jinan is only located in the fourth. The number of health institutions and the number of public buses and trams Per million people of Qingdao is located

in the first place, only the rate of Cable TV households is lower than Yantai, Qingdao shows the high level of public services. Jinan has the larger number of health institutions and the number of public buses and trams Per million people, but the rate of Cable TV households is only 65.9%, far behind of Yantai (100%) and Qingdao (90.5%). So Jinan's Social Security building needs to be improved.

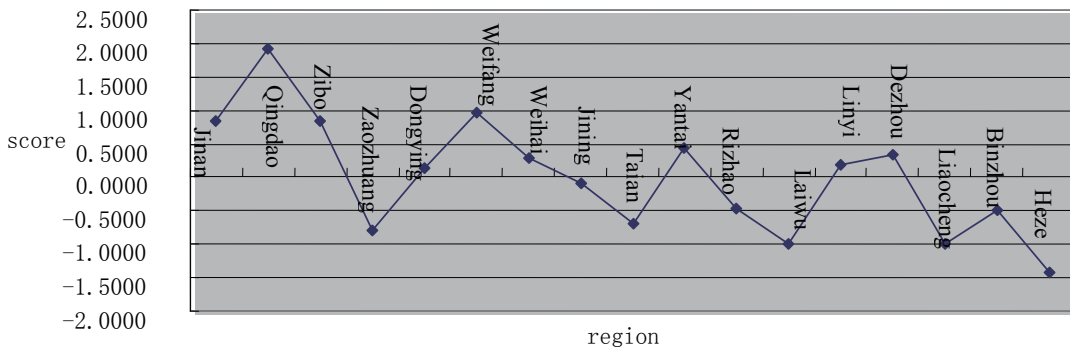


**Figure 4**  
**The Line Chart of Public Services' Score**

**3.1.5 Technological Innovation**

According to the regional scores of 17 cities in Shandong province in Table 2, the technological innovation scores' line chart is shown in Figure 5. As we can see from the figure, the highest technological innovation score is Qingdao, Jinan is the secondary only to Qingdao, the lowest score is Heze. Jinan's internal

expenditures of R&D activities and FDI are less than Qingdao, specially FDI(\$864.48 million), far lower than Qingdao(\$2,642,950,000)and Yantai(\$1,057,860,000). From the numerical analysis, we can conclude that Jinan's ability of attracting foreign investment is lower than the coastal cities of Qingdao and Yantai.

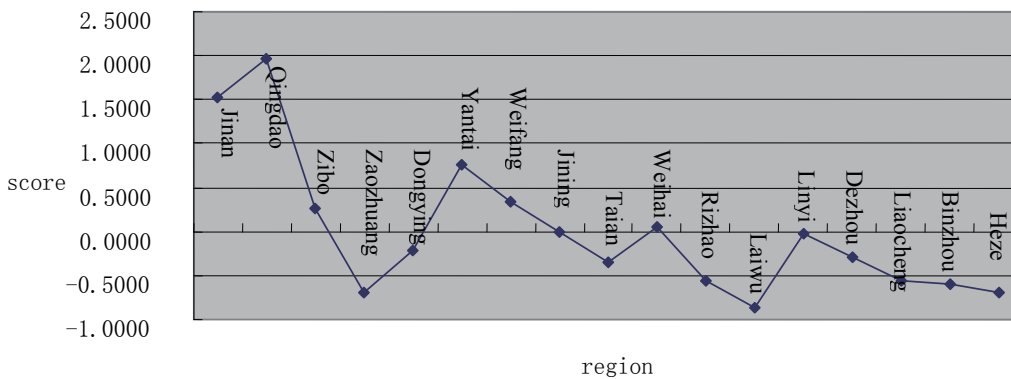


**Figure 5**  
**The Line Chart of Technological Innovation' Score**

**3.2 Composite Score Analysis and Evaluation of Regional Soft Power in Shandong Province**

According to the regional scores of 17 cities in Shandong

province in Table 2, the Shandong province's regional soft power scores' line chart is shown in Figure 6.



**Figure 6**  
**The Line Chart of Regional Soft Power' Composite Score**

As can be seen from the figure, the highest composite score of regional soft power is Qingdao, Jinan is located in the second place, the lowest composite score is Laiwu. From the above regional soft power score ranking analysis, Qingdao's regional culture, regional image, public services and technological innovation are four factors that are located in the first place among 17 cities, the only factor of human quality is only lower than Jinan, located in the second place. In conclusion, Qingdao's soft power composite score is the highest. This also explains Qingdao has balanced development of all aspects of the construction of the regional soft power, not biased. Jinan's regional soft power composite score is located in the second place, its human quality score is the highest, but other factors scores are lower than Qingdao, especially the score of regional culture, therefore, in order to strengthen the construction of soft power, Jinan should focus on cultural development, and strengthen the regions image of publicity, and make efforts to attract foreign investment. Heze and Laiwu's regional soft power score is lower, in order to improve the development of the regional economy, the government should strengthen the construction of regional soft power from regional culture, human quality, regional image, public services and technological innovation.

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## 4. RECOMMENDATIONS

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### 4.1 Recommendations for Enhancing Regional Soft Power

#### 4.1.1 Accelerating Economic Construction to Create a Solid Material Foundation for the Enhancement of Soft Power

Development is the key to resolve the contradictions and problems in advance. The most urgent and effective work of the 17 cities in Shandong province is to accelerate economic development. After knowing the current level of economic development in Shandong, we should grasp the economic advantages of the coastal area in Shandong Province, through their own efforts with national support, make efforts to maximize the guiding role of the conversion of the limited external policy of regional mechanisms, and give full play to the original economic advantages, and constantly enhance the economic strength of the coastal areas, to create broad relying space for the enhancement of soft power.

#### 4.1.2 Actively Abstract Characteristics and Culture of the City in Shandong Province, Vigorously Develop the Cultural Industry

In the process of enhancing regional soft power, cultural construction should be the layout of urban space, tourism development in close connection with the further integration of cultural tourism resources, and constantly

improve the cultural content of the industrial economy, to enhance the added value of cultural products; actively promote the news publishing industry, cultural tourism, the development of the entertainment industry; pay attention to the construction of cultural institutions and improvement of libraries, museums.

#### 4.1.3 Vigorously develop education, improve the human quality

The human quality is the most fundamental competitiveness. We must improve the human quality from the view of promoting social comprehensive, coordinated and sustainable development. Improving human quality is Not only from the local education by increasing investment to improve teachers' wages and benefits and working environment to provide a good educational environment for the cultivation of talents, but also actively by the introduction of high-end talent. Encourage universities, research institutes closely contact with the local high-end industry and set up a personnel training base, finally train shortage in the region for a variety of high-end talent in the region's economic development.

#### 4.1.4 Step up City Publicity and Make Efforts to Expand the Popularity of the City, Influence, Charisma, so as to Enhance the Regional Image

By excavating existing cultural resources, especially industrial and cultural resources, we should play features brand effect, change the industrial advantages to tourism resources to extend the original industrial chain. Shandong province has its unique tourism resources, tourism industry is an important industry in Shandong province, the local government should firmly grasp the advantages of tourism, increase the city's image propaganda in the province, other provinces and even abroad.

#### 4.1.5 Improve Public Service Capacity

Local governments should strengthen the construction of public facilities, improve public service network to provide more convenient services for the work and life of the local residents. Improving public services also can enhance the image of the region, the two factors are complementary.

#### 4.1.6 Strengthen Regional Technical Innovation Capability

With economic development, technological innovation becomes more important in enhancing the economy of a region. Rely on the original technical capabilities to enhance economic can slightly improve economy, we need technology innovation, new technology, new product generation can bring direct economic benefits. The government departments should vigorously support of technology innovation-oriented enterprises in the human and material resources, and provide a solid material foundation for technology innovation.

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## CONCLUSION

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This paper evaluates regional soft power of the 17 cities in Shandong province from five aspects, regional culture, human quality, regional image, public services and technological innovation, choose 19 evaluation indexes, finally build a operability strong regional soft power evaluation index system. Based on this evaluation index system, each city either horizontally compare to find their own strengths and weaknesses, but also by vertical comparison, every city can sum up the reason of the improvement of the soft power, and then formulate development strategies to improve regional soft power thereby improve the overall strength of the region.

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Peninsula Blue Economic Zone -- the comparative analysis between Yangtze River Delta and Pearl River Delta" (2012087).

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