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The Evaluation of Comprehensive Competitiveness of the Jinjialing Financial District

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Abstract: **Based on the research method of constructing evaluation system, this paper constructs the competitiveness evaluation system including three aspects of finance, talent and environment. In order to evaluate the comprehensive competitiveness of Jinjialing Financial District, we choose six financial center, such as Qingdao JinjiaLing Financial District, Beijing Financial Street, Shanghai Lujiazui Financial District, Shenzhen International Financial Center, Chongqing Jiangbeizui Financial District and Hangzhou Financial Center. By variable Screening, six influencing factors of financial competitiveness are selected as covariant for analysis of covariance (ANCOVA). The analysis results show that the comprehensive competitiveness of Jinjialing financial district is relatively weak, and some suggestions are given.**

Keywords: Jinjialing Financial District; comprehensive competitiveness; ANCOVA

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1. Introduction

In February 2012, Qingdao started the planning and construction of the Jinjialing Financial District. In August 2013, "Some Opinions On Speeding Up the Reform and Development of the Province" was put forward by Shandong Province. It proposed that Qingdao should be built into a leading and international wealth management center of China. In February 2014, the financial comprehensive reform test area of wealth management in Qingdao was approved and established by the State Council. It has become the only experimental area of comprehensive financial reform on the theme of wealth management in China. Jinjialing Financial District is near Laoshan scenic area. It is the core area and main position of Qingdao wealth management and financial comprehensive reform test area. It covers an area of 4.3 square kilometers, with a planned total construction area of more than 10 million square meters.

Jinjialing Financial District has excellent natural conditions and institutional conditions, which are closely linked with finance. However, the financial scale of the financial district is not coordinated with the urban economic status. The spatial layout, planning and construction of the financial district are lagging. The development level of the financial district is still in the primary stage, which shows as overall adaptation and local backwardness. This is the problem that the Jinjialing Financial District facing now. Therefore, comprehensive evaluation can provide a reliable basis for enhancing the financial comprehensive competitiveness of Jinjialing Financial District. Then we can formulate a financial development strategy with a strong pertinence. It promotes better and faster development of Jinjialing Financial District. So the study on comprehensive competitiveness of the Jinjialing Financial District has a very practical significance.

Financial competitiveness is a competitive advantage, which is shown by the financial or financial system of a country or region when competing with other countries or regions. It is an important component of a country or region's competitiveness [1]. It has the characteristics of integrity, dynamism, the relativity of space and time elements and the importance of environmental factors[2]. The study of the comprehensive competitiveness of the financial district is to research the financial competitiveness under the regional competitiveness[3]. The idea of this article is to conduct a comprehensive evaluation of Jinjialing Financial District.

As for the method of comprehensive evaluation of financial competitiveness, Choi S R, Park D and Tschoegl A E(2003) ranked the attractiveness of 14 financial centers by regression analysis[4]. Ren Wenhan(2014) gave the position and promotion measures of Qingdao wealth management ,which is on the basis of SWOT. Luan Wei(2014) evaluated comprehensively Qingdao wealth management center by using fuzzy comprehensive evaluation method and SWTO analysis[6]. Xu Weijun, Luo Tingfang and Guan Xuewei(2015) ranked six major financial cities of China by using factor analysis and cluster analysis[7]. Apart from these, the methods of evaluating urban financial competitiveness also include the principal component analysis, fuzzy mathematics, analytic hierarchy process, and so on[8-10].

The construction of Jinjialing Financial District as a regional financial district which is designed to be international and to influence surrounding areas, has an important significance of urban comprehensive development to Qingdao. In order to improve the comprehensive competitiveness of Jinjialing Financial District, we conducted analysis of covariance (ANCOVA) of the data from 2001 to 2016 of Qingdao, Beijing, Shanghai, Shenzhen, Chongqing and Hangzhou. By statistical study, we evaluate the comprehensive competitiveness of Jinjialing Financial District, and put forward some suggestions.

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2. Data Sources and Evaluation System

In order to evaluate the comprehensive competitiveness of Jinjialing Financial District, we select six cities, such as Qingdao, Beijing, Shanghai, Shenzhen, Chongqing and Hangzhou. The data selected in this paper are from the statistical yearbook of 2001-2016 years of six cities. According to the principle of scientific, comprehensive, hierarchical and data availability, the evaluation index system of the comprehensive competitiveness is constructed. In order to reflect the details, we have designed 5 second-level indexes and 18 third-level indexes (Table 1).

Table 1. The evaluation system of financial competitiveness

I	II	III	sign
Finance	Financial total	The financialvalue added(% of GDP)	y
		Per capita balance of deposits	x_1
		Per capita balance of loans	x_2
Talents	Professional talents	Financial practitioners/Tertiary industry practitioners	x_3
	Preparatory talents	Colleges and Universities	x_4
		The number of students in college and university	x_5
Environment	Living environment	AQI	x_6
		Tourists	x_7
		RPK	x_8
		Annual average wage of employees	x_9
		Per capita consumption	x_{10}
	Economic environment	GDP	x_{11}
		Per capita GDP	x_{12}
		Per capita added value of tertiary industry	x_{13}
		Annual import and export value	x_{14}
		Public budget receipts	x_{15}
		Public budget outlays	x_{16}
		Disbursement of foreign capital	x_{17}

3. Variable Screening

As for missing data, data interpolation method is used to get a complete data set. The financial value added is taken as response variable y. Other indexes are taken as independent variables x_1, x_2, K, x_{17}. The result of regression analysis is shown in Table 2.

According to the result, the*F* statistic for the regression equation is p<2.2e-16<0.05. So the regression equation is significant. Then we take the significance test for each variable, the value of intercepts, x_2, x_4, x_6, x_7, x_9, x_{10}, x_{13}, x_{14}, x_{15}, x_{16} and x_{17} is significant. In other words, the effect ofx1, x_3, x_5, x_8, x_{11}, x_{12}on yis not significant. It means that there is multiple collinearity between these variables. In other words, some variables can be interpreted or included by other variables. Therefore, we screen the variable by stepwise regression to eliminate collinearity. Finally, we select x_2, x_3, x_7, x_{13}, x_{14},$x_{17}$for the further study. The 6 variables are analyzed by regression analysis and the result is shown in Table 3.

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Table 2. The results of the regression analysis

	Estimate	Std.Error	t value	Sig.
Intercept	$1.519e+00$	$3.631e-01$	4.184	$7.46e-05$
x_1	$-1.631e-08$	$6.287e-08$	-0.259	0.79603
x_2	$2.551e-06$	$1.491e-06$	1.711	0.09106
x_3	$1.178e-01$	$7.430e-02$	1.585	0.11705
x_4	$1.011e-02$	$6.068e-03$	1.665	0.09988
x_5	$-6.564e-03$	$6.117e-03$	-1.073	0.28660
x_6	$-6.236e-03$	$3.701e-03$	-1.685	0.09600
x_7	$2.884e-05$	$1.543e-05$	1.869	0.06532
x_8	$2.935e-04$	$3.657e-04$	0.803	0.42470
x_9	$-1.211e-05$	$5.183e-06$	-2.336	0.02203
x_{10}	$5.009e-05$	$1.722e-05$	2.908	0.00474
x_{11}	$-9.854e-05$	$6.872e-05$	-1.434	0.15560
x_{12}	$7.808e-06$	$7.055e-06$	1.107	0.27185
x_{13}	$-1.136e-05$	$6.178e-06$	-1.839	0.06977
x_{14}	$2.372e-04$	$8.263e-05$	2.871	0.00526
x_{15}	$-5.460e-04$	$1.863e-04$	-2.932	0.00442
x_{16}	$5.551e-04$	$1.895e-04$	2.930	0.00445
x_{17}	$-5.342e-03$	$2.920e-03$	-1.829	0.07119

Table 3.The results of the adjusted regression analysis

	Estimate	Std.Error	t value	Sig.
Intercept	$1.484e+00$	$9.268e-02$	16.008	$<2e-16$
x_2	$4.014e-06$	$9.653e-07$	4.158	$7.36e-05$
x_3	$9.076e-02$	$4.663e-02$	1.946	0.0548
x_7	$3.014e-05$	$5.775e-06$	5.219	$1.16e-06$
x_{13}	$-8.844e-06$	$3.601e-06$	-2.456	0.0160
x_{14}	$1.678e-04$	$3.145e-05$	5.336	$7.17e-07$
x_{17}	$-6.288e-03$	$1.456e-03$	-4.319	$4.07e-05$

4. Descriptive Analysis

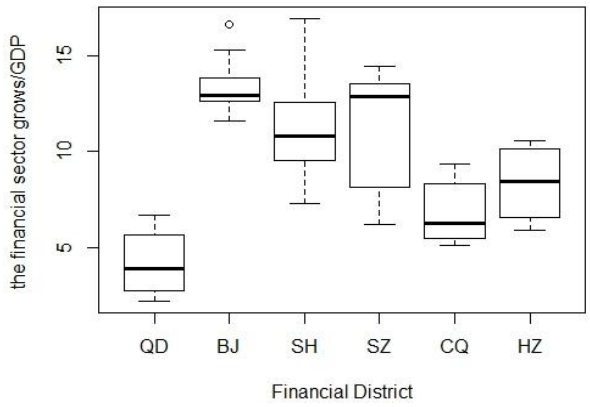

Figure 1. The box plot of the financial value added.

According to the data from 2001 to 2016, we draw a box plot of the financial value added in the six areas. Through box chart, the level of financial competitiveness between six financial areas can be compared intuitively. As shown in Figure 1.

With the help of the description method based on graph theory, the strict definition of industrial linkage can be as follows:

In Figure 1, the level of financial competitiveness of the six financial areas from high to low is Beijing Financial Street, Shenzhen International Financial Center, Shanghai Lujiazui Financial District, Hangzhou Financial Center, Chongqing Jiangbeizui Financial District and Qingdao JinjiaLing Financial District. Obviously, the financial competitiveness of six financial districts can be divided into three classes:

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Beijing Financial Street, Shenzhen International Financial Center and Shanghai Lujiazui Financial District, Hangzhou Financial Center and Chongqing Jiangbeizui Financial District, Qingdao JinjiaLing Financial District. The financial competitiveness of Jinjialing is much worse than other financial districts. Then we will give a more reasonable evaluation by ANCOVA.

Table 4. ANCOVA

	SS	Df	MS	F	Sig.
Regression	139.426	5	139.426	45.803	.000
α	923.892	1	184.778	60.702	.000
Error	270.919	89	3.044		
Total	1334.237	95			

Table 5. The average value of the level effect

Financial district	Mean	Standard error	95% confidence interval	
			Lower limit	Upper limit
Qingdao	0.638	0.031	0.577	0.699
Beijing	1.067	0.036	0.996	1.139
Shanghai	1.006	0.036	0.935	1.076
Shenzhen	1.022	0.033	0.955	1.089
Chongqing	0.877	0.036	0.805	0.949
Hangzhou	0.91	0.031	0.848	0.973

5. Financial Competitiveness Analysis of Covariance

ANCOVA is a statistical analysis method, which could combine linear regression analysis with variance analysis. Its basic idea is to consider the factors as a covariate, the corrected mean values of response variable could be compared in each group. In recent years, ANCOVA has been applied to many fields. For example, in the field of education and teaching, scholars use ANCOVA to evaluate teachers' teaching quality[11]. In the medical field, this method is used to select the treatment of disease[12].

ANCOVA is used to consider the financial competitiveness of six areas, is taken as the responsevariable.x_2, x_3, x_7, x_{13}, x_{14}, $x_{17}$are taken as covariate，which are denoted by z_1, z_2, z_3, z_4, z_5, z_6 respectively. Let$z_{ij,k}$be the value of influential factors of covariate $z_k$in jth year of ith financial district,α_i be thefinancial competitiveness level effect in ith financial district. Since the proportion of the financial value added (% of GDP) can reflect the degree of financial deepening and rapid growth of the financial industry[13], we choose the financial value added (% of GDP) as the response variable, y_{ij}represents the financial value added (% of GDP) in the jth year of the ith financial district.The evaluation model of financial competitiveness could be written as

$$logy_{ij} = \mu + \alpha_i + z_{ij}\beta + \varepsilon_{ij}, i = 1,...,6,\ \ j = 1,...,16 \quad (15)$$

Here, $\beta = (\beta_1, \beta_2, \cdots, \beta_6)', z_{ij} = (z_{ij,1}, z_{ij,2}, \cdots, z_{ij,6})$. Hence, in order to answer the question if these the financial districts have same financial competitiveness, we consider the following hypothesis test $H_0 : \alpha_1 = \alpha_2 = \cdots = \alpha_6 \leftrightarrow H_1 : \alpha_1, \alpha_2, \ldots, \alpha_6$not all equal.Table 4 shows the result of hypothesis test.Table 5 shows the financial level effectα_i.α_i represent the level of financial competitiveness. From observation, Beijing Financial Street has the strongest financial competitiveness, and it is followed by Shenzhen International Financial Center. The third district is Shanghai Lujiazui Financial District. The fourth area is Hangzhou Financial Center. Chongqing Jiangbeizui Financial District is the fifth financial area. AndQingdao JinjiaLing Financial District has the weakest financial competitiveness.

6. Conclusions

In this paper, we obtain the meaningful data of the financial competitiveness through constructing the evaluation system and screening variables. And then we rank six financial districts by ANCOVA. Although the comprehensive competitiveness of Jinjialing Financial District is not strong, Jinjialing Financial District has a rapid pace of development, stable trend of development and good development environment. By learning from the development strategies of other financial districts and making full use of their own development advantages, Jinjialing Financial District will have a sustained, stable and scientific development in the future. In recent year, the development trend of Jinjialing Financial District is relatively fast. But the economic development of the financial district is still in the primary stage. We need to improve the financial competitiveness of the financial district from three aspects, such as finance, talent and environment.

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