

# The correlation analysis between Tianjin higher education professional structure and industrial structure based on the gini coefficient

Hong Zhao<sup>1, a</sup>, Chen Zhu<sup>2, b</sup>

<sup>1</sup>School of economics, Tianjin Polytechnic University, Tianjin 300387, China;

<sup>2</sup>School of economics, Tianjin Polytechnic University, Tianjin 300387, China.

<sup>a</sup>zhaohong300160@126.com, <sup>b</sup>497880132@qq.com

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**Abstract.** The essay, based on analysis of gini coefficient about tianjin, studies regional industrial concentration degree in tianjin, and the degree of correlation between the tianjin industrial structure and higher education professional structure. On the basis of industrial structure changing trends, combined with higher education colleges and universities of professional evaluation index system, the essay puts forward some Suggestions on how to adjust professional structure under the background of "new normal", in order to enhance the level of specialty construction and improve the employment rate, strengthen the region's economic strength.

## Introduction

China's New Normal lead to adjust industrial structure optimization, which leads to the talent demand structure changes. In order to adapt to the "new normal" of cultivating high quality talents, making the students' own quality into full play, higher education should be carried out on major construction and professional assessment from a new, fully understand the quality of education and industrial development promote each other, the necessity of education professional and industry demand influence each other. So we must quickly optimize the professional structure, professional structure and the industrial seamless docking, talents training and social needs closely.

## The relationship between the professional structure and industrial structure

Professional structure refers to the various specialty especially ordinary undergraduate majors in the professional category, scale, professional level and professional quality connotation of proportional relationship and composition. Professional structure is according to the need of the subject frame and regional economic development. The change of industrial structure restricts the change direction of higher education professional structure, and professional structure in the region of the impact of industrial structure change. Further study of the relation between industrial structure and higher education professional structure, it is not only beneficial to the industrial structure of the construction of a scientific, reasonable, but also contributes to the rapid development of the regional economy.

## Professional structure evaluation model of colleges and universities

Talent supply and demand balance is a dynamic balance. The task of education reform is the reform of the structure of academic disciplines and industrial structure change. Education structure should be actively adapted to the economic structure. This requires professional structure must be established on the basis of scientific prediction of the demand, and the scientific prediction of

talents demand structure as its basis. According to the present situation of our country's higher education, this study established the evaluation index system of our country's higher education colleges and universities of professional structure, and applies the AHP method to calculate the relative weight, the result should be shown in the table below:

Table 1 Evaluation index system of our country's higher education colleges and universities of professional structure

Level indicators	The secondary indicators	The main points	The weight
Professional construction resource configuration	The practice teaching	Practice class accounted for	0.4221
		Industry and education cooperation projects	0.2079
	Professional facilities	infrastructure	0.1608
		Laboratories and experiment bases	0.0792
	funding	The four teaching funds	0.0938
		Other funds	0.0462
Professional teaching quality	faculty	Title and degree	0.2475
		Published in the scientific research achievements	0.5025
	Training scheme	Professional disciplines development planning	0.0594
		The rationality of the scheme	0.1206
	The construction achievements	Teaching quality of provincial level and above	0.0496
		Teaching achievement prizes at the provincial level and above	0.0231
Professional development space	Professional academic situation	Professional academic status and field	0.0396
		With the social and economic development adaptability	0.0804
	Professional demand	Related industries talents demand information	0.3752
		Related industry development prospects	0.1848
	Professional development	Social recognition	0.1056
		Graduate employment	0.2144

## The empirical research

### 1. Industrial concentration degree analysis of TianJin area.

Gini coefficient is used to measure the regional industrial concentration and the degree of agglomeration index, Its formula is:  $GINI = \frac{1}{2(N-1)} \sum_{i=1}^N \sum_{j=1}^N |\lambda_i^s - \lambda_j^s|$ ,  $\lambda_i^s$  and  $\lambda_j^s$  respectively the

i and j area of the proportion of S industry in the country, N said the total number of the national regions. This research chooses Rstudio software, on the basis of TianJin statistical yearbook data, calculate the department of TianJin in recent 10 years related industry cluster, and the ranking of each industry agglomeration (See table 2).

Table 2 The gini coefficient of each industry in TianJin in 2013 (general and divisions)

Name of the industry( general )	The GINI coefficient	The sorting
The first industry(A)	0.3907401	3
The second industry(B)	0.4127149	2
The third industry(C)	0.4190728	1

  

Name of the industry (divisions)	The GINI coefficient	The sorting
Agricultural(A)	0.3907401	12
Chemical raw materials and chemical products manufacturing(B1)	0.4696879	2
Communications equipment computer and other electronic equipment manufacturing industry(B2)	0.4646531	3
Black metal smelting and rolling processing industry(B3)	0.4165031	8
Transportation equipment manufacturing industry(B4)	0.4230257	7
Industrial(B5)	0.4279807	6
The construction industry(B6)	0.3289542	13
Transportation, warehousing(C1)	0.3922166	11
Wholesale and retail(C2)	0.4619908	4
Accommodation catering industry	0.3922509	10
The financial sector(C3)		
The financial sector(C4)	0.4617037	5
The real estate industry(C5)	0.5000295	1
Other tertiary industry(C6)	0.4062426	9

From table 2 shows, as a whole, overall agglomeration level of the third industry of TianJin is higher than the second industry, which illustrate the potential of TianJin in the rapid development of the third industry. The development of the secondary industry in the whole tianjin industry still has an important position. Although the third industry development level have improved recently, but the second industry development level is still in the advanced ranks in TianJin.

## 2. Higher education professional structure and the correlation analysis of the industrial structure.

Selection in the second and the third industry concentration degree is higher and lower industrial, through professional structure of higher education colleges and universities evaluation index system, using spss19.0 software to test the tianjin area industrial structure and the relationship between the higher education professional structure. The model is:

$$y = \beta_0 + \beta_1 \chi_1 + \beta_2 \chi_2 + \beta_3 \chi_3 + \mu \quad (1)$$

Through from the TianJin bureau of statistics data from 2002 to 2014 statistical bulletin, the results are obtained.(see table 3)

Table 3 Return to the summary

industry	Chemical raw materials and chemical products manufacturing	The construction industry	The financial sector	Transportation and warehousing
The coefficient of $\beta_0$	2.556 (0.700)	7.095 (0.085)	-0.365 (0.746)	3.865 (0.059)
The coefficient of $\beta_1$	1.381 (0.042*)	2.707 (0.916)	1.975 (0.023*)	1.405 (0.558)
The coefficient of $\beta_2$	0.339 (0.022*)	-1.902 (0.327)	0.537 (0.022*)	0.237 (0.477)
The coefficient of $\beta_3$	0.725 (0.027*)	1.434 (0.748)	0.602 (0.022*)	-0.022 (0.977)
r-squared	0.965	0.275	0.989	0.870
adjusted r-squared	0.945	0.160	0.986	0.826
regression sum of squares	1.925 (0.000a)	1.354 (0.625a)	1.588 (0.000a)	2.259 (0.000a)

Note: () values for probability P values, \* is significant at the 0.05 level, \*\* is significant at the 0.01 level

First of all, through the comparison of the value in table 3, you can see the chemical raw materials and chemical products manufacturing and construction regression fitting on the two times to have fundamentally different(adjusted r-squared are 0.945 and 0.165 respectively). Changes in the structure of education for the construction industry is obviously does not constitute a significant effect. Secondly, this article compared financial industry and transportation, warehousing. The fit of the two industries numerical difference is not big(adjusted r-squared are 0.986 and 0.826), but the significance test of regression coefficients of performance is different. Thus, according to the institutions of higher learning professional evaluation indexes of several of the most influential factors for technology-intensive industries have considerable influence.

### Conclusion

To sum up, the rapid development of technology intensive industries without higher education professional structure adjustment, and the labor-intensive industry development affected by higher education professional structure adjustment is relatively smaller. Technology-intensive industry development needs innovative high quality talents, and the labor-intensive industry for this type of talent demand is relatively much smaller. Therefore, under the "new normal", in order to change the pattern of economic development, adjust industrial layout, make from the labor-intensive, to technology intensive, we will increase the number of high quality talents, the professional structure of higher education can be adjusted.

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