Analysis of the Coordination Degree of Regional Science and Technology and Economy in China

Haiyan Huang [1], Ming Li [2], Hongbo Liu [2]

[1] Sichuan TOP IT Vocational Institute, Chengdu 611743, China

[2] Chengdu University of Information Technology, Chengdu 610103, China

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Abstract: Science and technology is an important factor and main force in promoting economic development. Starting from the development of science and technology and economy in China, this paper discusses the coordinated development of regional science and technology and economy. The evaluation index system of the coordinated development of science and technology and economic system is constructed through the two major systems of science and technology and economy, and the coordination and relevance of China's science and technology and economy are analyzed. In order to evaluate the coordination degree of science and technology and economy by using the coupling coordination degree model in five orientations and six provinces in the East, the west, the north and the south, the relevant suggestions on the coordinated development of regional science and technology and economy are put forward.

1. Introduction

Science and technology are an important factor and main force to promote economic development. It has not only made great contributions to the historical process of human civilization, but also will be the driving force of profound social changes. Science and technology determine national strength, and science and technology change national transportation. Promoting the development of science and technology is a realistic subject and objective requirement put forward to us in the present era. When discussing deepening the reform of science and technology system, General Secretary Xi Jinping pointed out that the prosperity of science and technology means the prosperity of the nation, while the strength of science and technology means the strength of the country. Nowadays, the state vigorously implements such strategies as "rejuvenating the country through science and education", "strengthening the country with talents" and "driving by innovation", which provides strong support for improving our comprehensive national strength and promoting economic and social development. Especially, the great achievements made in science and technology, economy and military in recent years have further confirmed the science and technology to the economy. The leading role of growth.

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From many relevant documents and materials, we can see that more and more scholars and experts have carried out qualitative or quantitative analysis and Research on the relationship between science, technology and economy, and put forward many suggestions and Countermeasures to promote the coordinated development of the two. However, in many academic discussions and theoretical studies, there are few studies based on the degree of coordinated development of science, technology and economy in different regions. Starting from the analysis of the situation of the development of science and technology and economy in China, this paper probes deeply into the coordinated development of science and technology and economy, constructs the evaluation index system of the coordinated development of science and technology and economy, and analyses its coordination and correlation, and selects six provinces (cities) from five directions of east, west, North and south. The coupling coordination degree model is evaluated.

2. Establishment of Index System

In this paper, the relevant factors and data affecting the strength of science, technology and economy are analyzed, to constitute an evaluation index system for the coordinated development of the two. In view of the complexity of the data variables of science and technology and economic system, the corresponding series of indicators are selected from the input, output, contribution of science and technology and the scale, structure and benefit of economic development. The specific index system is shown in Table 1.

3. Relevant Analysis of China's Scientific and Technological and Economic Strength

3.1 Measurement of China's Economic Strength

Because the dimension of each evaluation index of raw data is different, and its magnitude is different, in order to eliminate this influence, it is necessary to standardize the original data before specific analysis.

The standardized treatment formula is as follows:

For positive indicators: $Xij = \frac{Xij - Xjmin}{Xjmax - Xjmin} \qquad Xij \in (0,1)$

For reverse indicators: $Xij = \frac{Xjmax - Xij}{Xjmax - Xjmin} \qquad Xij \in (0,1)$

Formula: Xij is the original data of index J in year I and standardized data; Xj macx and Xj min are the maximum and minimum values of Xij's sequence respectively.

After standardization, the data were analyzed by principal component analysis, and two principal components were determined. The weights of the two principal components were 0.8672 and 0.1328, respectively. The evaluation function of economic and social development was constructed as follows: F=FAC1_1*0.8672+FAC2_1*0.1328. Factor scores are shown in Table 2.

Table 1. Evaluation Index System of Science, Technology and Economy

	First-level indicators	Secondary indicators	Three-level indicators
Evaluation Index System	Science and Technology Subsystem	Science and Technology Input Index	Full-time equivalence of R&D personnel
			Expenditure on research and experimental development
			Expenditure for large and medium-sized industrial enterprises to develop new products
			Government Funds Expenditure for Research and Experimental Development
			Research and Test Development Enterprise Funds
		Scientific and Technological Output Indicators	Publishing scientific and technological works
			Publishing scientific papers
			Number of scientific research and development institutions
			Number of patent applications authorized for invention
			Sales Income of New Products in Large and Medium-sized Industrial Enterprises
		Indicators of Scientific and Technological Contribution	Import and export volume of high-tech products
			Turnover in technology market
	Economic Subsystem	Economic Scale Index	gross domestic product
			Primary Industry Value Added
			Value added of secondary industry
			Value added of tertiary industry
			The Growth Rate of Fiscal Revenue
			Total imports and exports
			Consumption Level of Residents
			External debt balance
			National external debt ratio
			Taxes
		Economic structural indicators	The Contribution Rate of Primary Industry to GDP
			The Contribution Rate of Secondary Industry to GDP
			Contribution rate of tertiary industry to GDP
		economic benefits indicators	Per capita GDP
			The Impact of Final Consumption Expenditure on Domestic Production

Table 2. Factor Score

F1	1.58	1.33	0.73	0.49	0.11	-0.57	-0.6	-0.69	-1.14	-1.23
F2	-1.18	-0.2	0.26	0.56	1.14	1.85	0.18	-0.86	-0.58	-1.17
Score	1.21	1.12	0.67	0.5	0.24	-0.25	-0.49	-0.71	-1.06	-1.22

3.2 Measurement of China's Scientific and Technological Strength

After the same treatment, the weights of the two principal components are 0.866 and 0.134, respectively. The evaluation function of scientific and technological strength is F= FAC1_ 1* 0.866 + FAC2_1*0.134. Factor scores are shown in Table 3.

Table 3. Factor Score

F1	1.64	1.1	0.77	0.39	-0.24	0.17	-0.34	-0.95	-1.22	-1.32
F2	0.18	0.12	-0.34	-0.23	-0.44	-0.6	0.89	2.2	-0.18	-1.6
Score	1.45	0.97	0.62	0.3	-0.27	0.07	-0.18	-0.53	-1.08	-1.35

3.3 An Analysis of the Relevance between Economy and Science and Technology

The relationship between objective phenomena is interdependence or mutual restriction. It is a kind of unrestricted and uncertain interdependence, which is usually found in a large number of phenomena or through a large number of observations; it is a kind of relationship between phenomenal variables in an average sense. Dependence relation, which has a certain randomness, can be quantitatively described by a certain functional simulation under certain conditions.

According to the score of economy and science and technology, the correlation coefficient method is used to judge it. The formula is as follows:

$$R = \frac{\sum_{i=1}^{n}(Xi - \overline{X})(Yi - \overline{Y})}{\sqrt{\sum_{i=1}^{n}(Xi - \overline{X})^2 \cdot \sum_{i=1}^{n}(Yi - \overline{Y})^2}}$$ (R is the correlation coefficient, X and Y are the economic score and science and technology score respectively).

According to the different values of China's economic score (X) and science and technology score (Y) in Tables 2 and 3, the correlation coefficient R = 0.987 is calculated. Data show that there is a high correlation between science, technology and economy in China.

4. Selecting Some Regions to Make a Comparative Analysis of the Degree of Coordination between Science and Technology and Economy

This paper selected six key provinces (cities) from different geographical locations (east, west, south, north and middle), namely, Beijing, Zhejiang, Sichuan, Guangdong, Heilongjiang and Hubei.

In order to reduce the influence of subjective factors on the evaluation system and ensure the objectivity, authenticity and scientific of the evaluation, this paper uses the entropy method of information theory to make a quantitative comprehensive evaluation of the situation of science, technology and economy among regions in China. Firstly, the weights of science, technology and economy in these six regions are obtained by using the method of entropy, then the comprehensive evaluation index of regional science, technology and economy is obtained by the method of weighted summation. Finally, the coordination degree of economy and science and technology in each region is obtained by using the coupling coordination degree model.

4.1 Calculation of Weight Value and Comprehensive Evaluation Index

The calculation method of each index weight is as follows:

The calculation of index proportion. The proportion of index J in the first year is as follows: $P_{ij} = \frac{X_{ij}}{\sum_{i=1}^{m} X_{ij}}$

The calculation of information entropy. The information entropy value of item J is:

$$E\mathrm{j} = -\mathrm{k}\sum_{\mathrm{i}=1}^{\mathrm{m}} P\mathrm{ij} I\mathrm{n} P\mathrm{ij}$$

The calculation of weight. The weight of index J is: $W\mathrm{j} = \frac{(1 - E\mathrm{j})}{\sum_{\mathrm{i}=1}^{\mathrm{m}} (1 - E\mathrm{j})}$

The calculation of comprehensive evaluation value. The comprehensive evaluation index for the first year is as follows:

$$S\mathrm{i} = \sum_{\mathrm{j}=1}^{\mathrm{n}} W\mathrm{j} X\mathrm{ij}$$

The weights of economy and science and technology in these six provinces are obtained by using the method of entropy. The results are as follows: Table 4 and Table 5:

Table 4. Weights of Regional Economic Indicators in China

region	Sichuan	Hubei	Guangdong	Zhejiang	Beijing	Heilongjiang
Gross domestic product	0.03256	0.03742	0.02031	0.02093	0.02193	0.01922
Consumption Level of Residents	0.03097	0.0287	0.01756	0.01945	0.01629	0.02766
Revenue	0.05496	0.07194	0.0406	0.03181	0.03658	0.03344
Investment in Fixed Assets	0.05504	0.07856	0.03593	0.03925	0.01456	0.04956
Expenditure	0.04632	0.0585	0.04753	0.04075	0.03966	0.03759
Consumption Level of Urban Residents	0.01722	0.01976	0.01307	0.0131	0.01531	0.02397
Per capita GDP	0.03289	0.03642	0.01536	0.01715	0.01117	0.01911
Primary Industry Value Added	0.01389	0.02303	0.0135	0.01236	0.00700	0.03779
Value added of secondary industry	0.03658	0.04004	0.01596	0.01491	0.01301	0.00806
Value added of tertiary industry	0.03896	0.04072	0.0265	0.03039	0.02538	0.03469

Table 5. Weights of Regional Science and Technology Indicators in China

region	Sichuan	Hubei	Guangdong	Zhejiang	Beijing	Heilongjiang
R&D personnel	0.01007	0.02195	0.02263	0.03938	0.00356	0.00371
R&D Funds	0.09670	0.10505	0.07427	0.06877	0.03688	0.01193
Number of R&D Projects	0.01179	0.01887	0.02882	0.05994	0.00313	0.00368
Number of New Product Projects	0.00977	0.00902	0.01981	0.02489	0.00651	0.00433
Funds for developing new products	0.03795	0.05927	0.08126	0.03620	0.04533	0.00593
New Product Sales Revenue	0.00975	0.09126	0.06161	0.08284	0.00397	0.00124
Turnover in technology market	0.10805	0.19786	0.06841	0.01268	0.08088	0.07843
Number of patent applications	0.13928	0.08838	0.04395	0.03121	0.05669	0.05117

According to the method of weighted summation, the comprehensive evaluation index of regional economy and science and technology in China is obtained. The results are as follows: Table 6 and Table 7:

Table 6. Comprehensive Evaluation Indicators of Regional Economy in China

Particular year	Sichuan	Hubei	Guangdong	Zhejiang	Beijing	Heilongjiang
2015	0.572	0.752	0.383	0.366	0.294	0.424
2014	0.535	0.674	0.341	0.332	0.271	0.412
2013	0.490	0.599	0.314	0.308	0.255	0.396
2012	0.439	0.525	0.284	0.280	0.232	0.362
2011	0.385	0.459	0.261	0.258	0.211	0.320
2010	0.322	0.368	0.226	0.221	0.186	0.266
2009	0.270	0.304	0.193	0.187	0.163	0.221
2008	0.233	0.267	0.178	0.170	0.148	0.201
2007	0.192	0.222	0.154	0.149	0.135	0.167
2006	0.156	0.182	0.130	0.129	0.113	0.143

Table 7. Comprehensive Evaluation Index of Regional Science and Technology in China

Particular year	Sichuan	Hubei	Guangdong	Zhejiang	Beijing	Heilongjiang
2015	0.539	0.845	0.525	0.472	0.251	0.143
2014	0.542	0.804	0.49	0.433	0.261	0.16
2013	0.472	0.704	0.466	0.4	0.253	0.155
2012	0.404	0.56	0.405	0.346	0.228	0.149
2011	0.292	0.465	0.334	0.29	0.189	0.138
2010	0.282	0.42	0.304	0.253	0.19	0.142
2009	0.269	0.336	0.233	0.223	0.146	0.112
2008	0.224	0.247	0.188	0.194	0.146	0.09
2007	0.196	0.211	0.156	0.139	0.125	0.101
2006	0.166	0.143	0.105	0.098	0.107	0.093

4.2 Analysis of Coupled Coordination Degree

There is a certain degree of interaction between economy and science and technology, which is the coupling body of interaction. Next, the coupling coordination degree model is introduced to analyze the coupling relationship and coordination degree of the interaction between different regional economies and science and technology. Specific models are as follows:

$$C = \left(\frac{f(x) * g(y)}{\left(\frac{f(x)+g(y)}{2}\right)^2}\right)^2$$

Among them, C is the coordination degree, f (x) and G (y) are the comprehensive evaluation index functions of economy and science and technology respectively.

$$T = \alpha f(x) + \beta g(y)$$

Among them, T is the comprehensive coordination index of economy and science and technology, and alpha and beta are the undetermined coefficients. Here, the author thinks that science and technology are equally important to economy, so it is assumed that alpha = beta = 0.5 is discussed.

In combination with the previous overview of coordinated development, D should be regarded as the coordinated development degree of economy and science and technology $D（X，Y）= \sqrt{C * T}$, It reflects the coupling degree of the overall coordination between economy and science and technology.

According to the above regional science and technology comprehensive evaluation index, economic comprehensive evaluation index and coupling coordination degree model, the coupling coordination degree of science and technology and economy of six provinces (cities) during 2006-2015 is obtained. As shown in Table 8.

Table 8. Coordination Degree of Regional Science, Technology and Economy Coupling in 2006-2015

Years	Sichuan	Hubei	Guangdong	Zhejiang	Beijing	Heilongjiang
2015	0.745	0.891	0.657	0.637	0.519	0.402
2014	0.734	0.853	0.624	0.608	0.516	0.431
2013	0.693	0.802	0.601	0.585	0.504	0.424
2012	0.648	0.736	0.569	0.553	0.480	0.418
2011	0.571	0.680	0.537	0.522	0.446	0.403
2010	0.547	0.625	0.504	0.485	0.434	0.410
2009	0.519	0.564	0.457	0.449	0.392	0.364
2008	0.478	0.506	0.427	0.425	0.383	0.326
2007	0.440	0.465	0.394	0.379	0.360	0.344
2006	0.401	0.397	0.339	0.331	0.331	0.328

According to the relevant literature, the classification criteria of coordination degree are as follows: Table 9:

Table 9. Coordination Degree Criteria

Coordination Degree	0.00-0.09	0.10-0.19	0.20-0.29	0.30-0.39	0.40-0.49	0.50-0.59	0.60-0.69	0.70-0.79	0.80-0.89	0.90-1.00
type	Extremely maladjusted recession	Serious maladjustment recession	Moderate maladjusted recession	Mild maladjustment recession	On the verge of imbalance recession	Barely coordinated development	Primary coordinated development	Moderate coordinated development	Good and coordinated development	High-quality and coordinated development

4.3 Analysis of Results of Regional Coordination Degree

The analysis shows that from 2006 to 2015, the coordination degree between science and technology and economic development of six provinces (cities) has been improved in varying degrees, and the order of promotion is Hubei, Sichuan, Guangdong, Zhejiang, Beijing and Heilongjiang. Among them, the promotion of larger Hubei Province from the stage of mild maladjustment recession to the stage of good coordinated development, and the promotion of smaller Heilongjiang Province from the stage of mild maladjustment recession to the stage of coordinated development on the verge of maladjustment recession. Generally speaking, the coordination degree of science, technology and economic development of six provinces (cities) has been on the rise in varying degrees during the decade.

Among the six selected provinces (cities), Hubei Province has been in the leading position in coordinating the development of science, technology and economy in the past ten years. Although Hubei Province was on the verge of coordinated recession and reluctant coordinated development in 2006 and 2007, after that, it paid more attention to the coordinated development of science, technology and economy; in 2013, its coordination degree reached 0.802, which was in a good coordinated development state; in 2015, it reached 0.891, which was close to the ranks of high-quality coordination state. From Table 4 and Table 5, we can see that the "R&D expenditure", "new product sales income", "technology market turnover" and "fiscal revenue and expenditure", "per capita GDP" and "added value of secondary and tertiary industries" in the weight of scientific and technological indicators in Hubei province are all in six provinces. This shows that Hubei Province attaches more importance to the advanced development of science and technology. By increasing the funds for research and experimental development and paying more attention to and investment in innovative science and technology, it effectively improves the ability of economic development and finally achieves economic growth.

Guangdong Province and Zhejiang Province are located along the coast. They have convenient land and water transportation and smooth information. They are major provinces in economic development. In 2015, the expenditure on research and experimental development in the two provinces reached 152 billion yuan and 85.3 billion yuan respectively, suggesting that their scientific and technological investment is relatively large and their scientific and technological strength is constantly increasing. However, due to the fact that the output of science and technology is far below the economic development benefit, the turnover of Guangdong's technology market reached 66.257 billion yuan in 2015, while the GDP reached 7281.255 billion yuan in that year; the turnover of Zhejiang's technology market in 2015 was 9.809 billion yuan, and the GDP in that year was 428.649 billion yuan, which resulted in the relative coordination between science and technology and economy in these two provinces. Low, but the degree of coordination is basically similar, are in a balanced state of development. This shows that the original industry is still the main body of the

local national economy, and the characteristics of the local industrial structure determine the degree of market and the speed of transformation and upgrading.

The coordinated dispatch of Sichuan, Beijing and Heilongjiang provinces is on the rise, and depressions occur in all three provinces during their development. In 2011, Sichuan Province had a depression, and its economy and science and technology were in a state of barely coordinated development. In 2011, the research and experimental development personnel in Sichuan Province had a full-time equivalent of 36,839 person-years, R&D expenditure of 10.446 billion yuan, and GDP of that year was 2102.668 billion yuan. In 2009 and 2011, there were depressions in Beijing, and the economy and science and technology were off the verge of imbalanced recession. They were reluctantly coordinated. In 2009, the R&D expenditure of Beijing accounted for 0.7% of GDP, 0.75% in 2010 and 1.01% in 2011. In terms of the proportion of three consecutive years, the investment in science and technology in Beijing was increasing, but due to the increase in 2010. Long and slow, so that in 2009, 2011, the coordination of the depression. Heilongjiang Province is not optimistic about the degree of coordination, the index has been maintained at about 0.4, the development is slow, and there have been depressions for many years. Although Heilongjiang Province has been increasing in science and technology investment for many years, the growth is slow. In 2015, the research and experimental development personnel equivalent is 317.62 million person-years, which is only 5% of the developed province of Guangdong. This shows that there are some problems in Heilongjiang Province in recent years, such as relatively insufficient investment in science and technology, relatively weak science and technology, and so on.

The results show that from the macro level, there is a high correlation between science and technology and economy in China, and they are interdependent and mutually reinforcing; from the micro-regional level, there is a big difference in coordination between science and technology and economy among regions, which shows that resources allocation, science and technology input and output, and industrial transformation among regions in China. There are still obvious gaps in upgrading.

5. Countermeasures and Suggestions

Through the above analysis, we can reach the following consensus. Under the background of "new economy", it is particularly important to realize the interaction and coordinated development between regional scientific and technological progress and economic growth. To this end, this paper suggests that:

5.1 Continue to Increase Investment in Science and Technology, and Constantly Improve the Quality and Quantity of Economic Development

According to the research in this paper, the development of science and technology has a highly linear positive correlation with economic development. Therefore, the development of science and technology will have a good role in promoting economic development. However, from the current situation, China's investment in science and technology is relatively low. For example, in 2016, China's R&D investment intensity reached 2.11%, 0.05 percentage points higher than in 2015, but there is still a certain gap compared with the average level of 2.40% in OECD countries. Therefore, in order to promote the relative coordinated development of science and technology and economic level in different regions of China, we must continue to increase investment in science and technology from all levels and channels, accelerate the construction of local advanced infrastructure network, guide traditional industries to accelerate equipment renewal and technological progress, and promote more industries. Leap to the middle and high-end, and then enhance the quality and quantity of economic development of the whole country.

5.2 Planning Regional Scientific and Technological Input in an Integrated Way According to Local Conditions

Because of the different geographical location, population density, traffic situation and industrial structure, there are obvious differences in the matching degree between scientific and technological input and economic development level. From the index of regional R&D investment intensity, we can see that the R&D investment intensity in some regions lags behind the economic development level. For example, the R&D investment intensity in Heilongjiang is 0.99%, Sichuan is 1.72%, Hubei is 1.86%, Zhejiang is 2.43%, Guangdong is 2.56%, and Beijing is 5.96%. In fact, from these six provinces and cities, the economic and technological investment intensity is 0.99%, Sichuan is 1.72%, Hubei is 1.86%, Zhejiang is 2.43%, Guangdong According to the broken line chart of coupling coordination degree, the order of better coordination degree is Hubei, Sichuan, Guangdong, Zhejiang, Beijing and Heilongjiang, so the more input, the better coordination degree is not. Therefore, all localities should be good at summarizing and discovering the commonness and characteristics among regions, combining with the specific situation of the region itself, overall layout, rational planning, allocation and efficient use of scientific and technological resources, so as to better transform science and technology into productive forces, so that the mode of economic growth in the era of knowledge and technology depends on technological progress, and economic development can be realized. Technology feedbacks.

5.3 Government-led Implementation of Differentiated Science and Technology Support Policies

To further strengthen the research on Regional Science and technology and economic issues, especially in the specific policy of national support for science and technology and economy, we should focus on subsidizing the leading industries or leading industries in the region. For example, Hubei Province took the lead in introducing innovative policies such as Ten Articles of Science and Technology and Nine New Articles of Science and Technology throughout the country to promote the reform of science and technology system in an all-round and in-depth way, and vigorously implemented the "Doubling Plan of Leading Industries" and the "Continuous Plan of 100 billion RMB Industries". Among them, Fast Boat Small Solid Launch Vehicle pioneered the integration of satellite and rocket technology, single-mode optical fiber super-large capacity optical transmission has repeatedly refreshed the national record, wide-area real-time precision positioning key technologies to achieve the nationwide decimeter-level and key regional centimeter-level positioning services and other major scientific and technological achievements landed on the ground, with remarkable scientific and technological results. The annual turnover of technology contracts in the whole province maintained a growth rate of more than 50%, and maintained the first place in the central and western regions and leaped to the second place in the country, breaking through 83 billion yuan. Thus, local governments should implement differentiated support policies to guide different regions to form innovative systems with their own characteristics; strengthen research on regional superior industries, focus on regional strategic pillar industries, and create regional innovation poles with multi-support; and seek ways and means of market-oriented technology and strive to acquire science and technology. The inflow of technology and knowledge resources.

5.4 Constructing an All-round Platform System for Scientific and Technological Innovation to Effectively Promote the Transformation of Scientific and Technological Achievements

First, we should build a diversified platform for scientific and technological financial cooperation, give full play to the special initiative function of policy-based financial institutions, guide other financial organizations to support technologically innovative small and medium-sized enterprises financially, and increase their investment; and establish a government-led seed fund or credit guarantee system for high-tech entrepreneurship, so as to enable them to More venture capital institutions are involved in supporting the growth of small and medium-sized technological innovative enterprises. Second, build a multi-dimensional science and technology service platform to effectively promote the transformation of scientific and technological achievements. (1) Promote and improve the professional construction of various service institutions for the transformation of scientific and technological achievements, and further guarantee the declaration, promotion, transfer

and transaction of scientific and technological achievements; (2) Encourage more scientific and technological personnel to participate in or even directly establish small and medium-sized scientific and technological enterprises, so as to build a comprehensive technology that understands both professional technology and market and management. The team of brokers will provide the guarantee of human resources for the transformation of scientific research achievements; (3) Introducing market mechanism to change the original administrative allocation mode of scientific and technological resources, so as to conform to the law of scientific and technological innovation and the national strategy-oriented allocation mode of resources, and improve the efficiency of input and output.

References

[1] Ge Jintian. On the coordinated development of economy and society based on scientific and technological innovation [J]. Journal of Jinan University (Social Science Edition), 2008, 18 (2): 80-83.

[2] Wang Yanming, Xu Qiao. A comparative analysis of the degree of coordination between science and technology and economy among regions in China [J]. Science and technology progress and countermeasures, 2009, 20 (3): 29-31.

[3] Xu Xu, Jia Jingru. Research on the Coordination between Scientific and Technological Progress and Economic Development [J]. China Science and Technology Forum, 2012, 7:50-55.

[4] Wei Jinyu, Bai Dongdong. Study on the difference of coordination between science and technology and economy under the coordinated development of Beijing, Tianjin and Hebei [J]. Science and technology and economy, 2015, (05):96-100.

[5] Sumin. Analysis of coordinated development of regional science, technology and economic system [J]. Economic and trade practice, 2016, 15 (1): 42.

[6] Dong Ye, Aniwar Amuti. Evaluation of Coordination Degree between Regional Science and Technology and Economic and Social Development Based on Empirical Research in Xinjiang [J]. Exploration of Economic Issues, 2010, (12):82-88.

[7] Guo Jiangjiang, Qiwei, Miao Runner-up. Research on the Measurement of Coordination between Science and Technology and Economic and Social Development in China [J]. China Science and Technology Forum, 2012 (05): 123-129.