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The Convergence of "Made in China-2025" and Prevention Mechanism

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Abstract. After years of rapid development Chinese manufacturing industry has become the world's largest, independent and complete manufacturing system. Still, there are some problems such as being big but not strong, lacking independent innovation and irrational industrial structure. Therefore, the Sate Council has issued "Made in China-2025", putting forward the macro strategy for its innovation-driven development. Correspondingly, all the provinces and big cities in China have issued relevant "Platform for Action" and "*Implementing* Regulations". This article analyzes the new policy by statistics, and correlation analysis. It finds the issue of convergence, and suggests establishing a prevention mechanism of provincial strategic planning homogeneity, to solve the problem of provincial policy convergence and avoid the risk of industry homogeneity.

Introduction

May 8,2015,China's State Council unveiled its first 10-year national plan for transforming China's manufacturing, entitled "Made in China 2025". This strategy sets the direction for the transition from "Made in China" to "Create in China". Under the guidance of this ambitious strategy, all over the country have put forward the innovative development strategy direction of the province and the city, and issued their action outline. China's rapid development of manufacturing shows that if the state encourages the direction of science and technology ,the local industries and local governments will tend to form a huge impetus throughout the country to seize the opportunity .And the result is repeated construction, excess capacity, resulting in a huge waste of resources. For example, in April 2014, the Yangtze River economic zone was promoted to a national strategy. Some studies have calculated 11 specialized industries in 11 provinces and cities, of which 8 provinces and cities in the printing industry to form a specialized sector, 7 provinces and cities in the chemical Raw materials and biomedical departments to form specialized departments, six provinces in the textile industry to form a specialization, etc.. The problem of industrial homogeneity is very serious. So that China has to implement the "address overcapacity" policy, the "supply-side structural reform." Although the state has strengthened the "top-level design", developed a leading strategy, there is still information asymmetry between regions, the lack of effective meso-level and micro-collaborative mechanism. The consequences of policy implementation is the regional industry convergence, resulting in a new round of waste of resources. So governments focus on inter-provincial strategy of coordination, under the guidance of national strategy, can help them to avoid homogenization risk early .

Review of Innovation Policies and Innovation Strategies

After Schumpeter studied "innovation theory" in 1912,the domestic and foreign theoretical circles researched "innovation" for a systematic study from economics , Management, Political Science, Sociology and Philosophy respectively. Countries have introduced "innovative" policies and bills. For example, in 1976 the US government adopted the "National Science and Technology Policy Organization and the focus of the law".And a few years later the government passed the "Technology Innovation Law" and "Federal Technology Transfer Act".Clinton government issued "technology and national interests" report in 1996. Japan in 1981 developed "creative science and technology to promote the system". And in March 1986, the cabinet decided the 21st century science and technology policy framework, as the basic policy of science and technology

revitalization, which determined the future development of science and technology and the work point.

Seeing the importance of innovation policies in United States and Japan, governments have made a lot of policy efforts to develop innovation.The earlier definition of innovation policy appeared on the OECD report in 1982: “Innovation Policy”“Innovation policy” is a policy that supports the development of innovative activities ,according the idea of innovative theory,and focus on the dimension of national science, technology, education and industry. In 2004,Chen Jinhe, Xu Dake and other scholars put forward their own opinions on the innovation policy. “Innovation policy means that the sum of the public policies adopted by a national or regional government to promote innovation”.Later studies have found that innovation policies among countries and regions continue to converge. Sam Garrett-Jones argued that “Because of the response to globalization, national and inter-regional policies will lead to convergence with mutual learning.” Tarm Lemola further argued that “Although the region and the state will adjust its policies according to its own characteristics, convergence (in the OECD countries) still could become an important trend.” According to CNKI database statistics,the literature of our government's innovation policy has increased significantly. However, the current research on China's innovation strategy is mainly focused on the whole national strategy and evolution process.Only a few analyzes the policies of individual provinces or areas provinces,which lacks opinions or suggestions from the overall perspective on China's different provinces and municipalities.

Data and Methodology

This paper focus on “China made 2025” provincial “Action Plan” of the municipalities and municipal governments on the official website published excluding Hong Kong, Macao and Taiwan.Because the Heilongjiang, Inner Mongolia and Tibet ,the limited economic & technological level,did not release the action outline,and Shanghai, Chongqing, Liaoning, Ningxia, Guizhou did not publish its “outline”. This article finally selected 23 provinces and autonomous regions of the innovation policy as a research object. The purpose of this study is to provide advice or advice on follow-up development.This article mainly uses the general statistical method, the content analysis method,and the correlation analysis method.

Data

Over the past decade, 17 provinces and cities in China blindly have followed the national strategy,which made the common “photovoltaic industry”as a local strategic emerging industries.

In order to show whether there are high repetition rates in some key sectors in China's interregional innovation policy, this part statistics the action plans of 23 provinces and municipalities as table 1.

Table 1 The Coverage of the Provinces Innovative Strategic Industries

Ten key sectors	Segmentation of industry coverage	Primary industry coverage
New information technology	91.30%	79.71%
	86.96%	
	60.87%	
Numerical control tools and robotics	91.30%	82.61%
	73.91%	
Aerospace equipment	69.57%	69.57%
	69.57%	
Marine engineering equipment and high technology ships	56.52%	56.52%
Advanced rail transit equipment	69.57%	69.57%
Energy saving and new energy vehicles	100.00%	100.00%
Power equipment	69.57%	69.57%
Agricultural equipment	60.87%	60.87%
New material	95.65%	95.65%
Biomedical and high performance medical devices	95.65%	95.65%

According to the horizontal comparison, interregional innovation policy does have a high repetition rate in some key sectors. For example,the strategic coverage rate of energy-saving and new energy vehicles field ,in this article,reached 100%,which means that 23 provinces will develop new energy vehicles as a city innovation strategy in the future.Agricultural machinery and equipment field is the least coverage rate of the area reaching 60.87%.The coverage rate of ten key sectors has reached more than half .It is unreasonable that different provinces and cities make the same choices with their different conditions.This is likely to cause vicious competition, waste of resources, repeated construction and overcapacity.

Methodology

On the basis of semantic analysis, the term correlation analysis is used to further sort out the relationship between interregional innovation policies and verify its convergence.Let W = {W_1、W_2、…， W_n} be the set of important terms, T = {t_1,t_2,…， t_m} is the set of documents to be studied. The frequency of the term W_K in t_i is X_{ki}, then the similarity between t_i and t_j is:

$$S_{i(t,t)} = \frac{\sum_k X_{ki} \bullet X_{kj}}{\sqrt{\sum_k (X_{ki})^2} * \sqrt{(\sum_k X_{kj})^2}} \quad (1)$$

The similarity S can represent the similarity of the two documents.

The term correlation analysis method was used to calculate the provincial and municipal strategies The similarity of the national strategy S showed in Table 3.

Table 2 Regional Policy Similarity with National Policy

Province	China	Beijing	Fujian	Gansu	Guangdong	Guangxi	Hainan	Hebei
S	1	0.1105	0.1156	0.1029	0.1140	0.1102	0.1099	0.1155
Province	Henan	Hubei	Hunan	Jilin	Jiangsu	Jiangxi	Qinghai	Shandong
S	0.1108	0.1291	0.1096	0.1115	0.1092	0.1097	0.1117	0.1117
Province	Shanxi	Shaanxi	Sichuan	Tianjin	Xinjiang	Yunnan	Zhejiang	Anhui
S	0.1117	0.1104	0.1084	0.1084	0.1108	0.1104	0.1103	0.1101

Note: Because of too much high frequency words,this table only selected the top 40 as the calculation.

According to Table 1, the repetition rate of key sectors in 23 provinces is over 60%. After the term correlation analysis, 11% of the main features are the same, indicating that interregional innovation policy does exist Convergence problem.

Prevention Mechanism of the Inter-provincial Policy Convergence

Under the guidance of the national strategy, the inter-provincial co-ordination and differentiation of development depends on the meso-level and micro-level synergies established.

- To establish a national macro-level coordination mechanism.

In the formulation of regional innovation policy, governments should take into account the problem of industrial layout, the use of Industry-University-Research Collaboration to avoid a single perspective of the limitations and one-sided, and the establishment of national macro-level coordination mechanism. At the same time, the guidance of national strategies should be emphasized rather than mandatory. The national innovation strategy is, to some extent, merely a guide to local policy and is not enforced. It is necessary to establish a national macro-level coordination mechanism to avoid the local government for the central government to provide resources to blindly launched, forced expansion of the situation.

- To encourage all localities to adapt to local conditions, strengths and weaknesses, differentiated development of the strategic path.

Convergence is an indispensable process in organizational learning. The reason for the regional innovation policy convergence is that it is guided by the national innovation strategy and macroscopic direction. On the other hand, the interdisciplinary interaction and experience diffusion of “excellent” innovation policy resulting in.On the basis of the existing industrial development,government should give full play to the comparative advantages of their respective industries, guide the development of advantageous industries, improve the efficiency of resource allocation, support and encourage strategic cooperation in industrial parks, guide industrial transfer and avoid low-level redundant construction.

- Encourage the formation of inter-provincial strategic coordination and coordination mechanisms.

In the Yangtze River Delta, the Pearl River Delta, the Beijing-Tianjin-Hebei, central and western regions formed a strategic regional strategic coordination mechanism in the inter-provincial region, forming the industrial chain, innovation chain, capital chain closely coordinated, high-intensity advance, as soon as possible to form a breakthrough, to seize the strategic high ground. (1)Regional government set up special coordination departments to strengthen regional cooperation.(2)Regional governments set up special funds to increase the financing channels and reduce the burden on local governments by attracting private capital or foreign capital.

- To encourage autonomous regions, the state support to support the “future industry” mechanism.

The state should encourage policy support in the provinces to vigorously foster future “potential industries” with potential advantages, forward-looking scientific and industrial prospects.If the industry is indeed able to develop in the region, with potential advantages, then the regional innovation policy should encourage the development of such scientific and forward-looking “future industry”, “innovation industry.”

Conclusion

The objective of this paper has been to explore new “made in China 2025”policy by statistics and correlation analysis.It finds the issue of convergence, and suggests establishing a prevention mechanism of provincial strategic planning homogeneity, to solve the problem of provincial policy convergence and avoid the risk of industry homogeneity.Given the nature of our study, some limitations have to be taken into account.On one hand,it’s not comprehensive that this article only to search 23 policy provinces’ “Made in China 2025”. On the other hand,it is not unlikely that there are significance differences across countries with political contexts. Therefore,our results may not be generalised to other countries.

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