

Integration of industry cooperation development research in Bohai Economic Rim

Xing Junwei

Institute of Provincial Research, CPC Liaoning Provincial Party School,
Shenyang, Liaoning 110004

Abstract — Integrated development of industrial cooperation is the core content in the Bohai economic rim. Industrial structure convergence of Bohai economic rim mainly exist in macro three industries while it rarely exist in the manufacturing industry and other internal meso level. Learning from changing tendency, industrial structure convergence in the five provinces and municipality in the Bohai Economic Rim tend to be increasingly intense. For integration of industry cooperation development in Bohai Economic Rim, it is faced with massive separation, industrial development convergence and is restricted by institutional and ideological barriers. As strategic choice based on interest tending, integration of industry cooperation development in Bohai Economic Rim should be further integrated on development concept of industrial transformation to promote institutional system of the integration of industrial development and optimize the industrial layout and division system of Bohai economic rim.

Key Words- Bohai rim; industry; integration

1. INTRODUCTION

As one of Chinese economic growth pole with most comprehensive advantages and development potential, Bohai Sea region has an important strategic position in the global opening up and modernization construction and is compared to one of "troika" of the great rejuvenation of the Chinese nation. In September 2015, issuing by the Prime Minister Li Keqiang, State Council approved the "Outline for Cooperation and Development in Bohai Sea region." The Outline clearly defines the six key tasks for development in Bohai Economic Circle and propose to promote

industry cooperation in Bohai economic circle and vigorously boost the integrated development of industry. However, at this stage, the Bohai economic circle industry still faces structural convergence, weak concentration, aggregation and other issues. Research on the industrial division and integration development of Bohai economic circle is of great importance for speeding up the Bohai economic circle industry upgrading and promoting the regional integration development.

2. Connotation of the industry integration

Since the regional economic integration is the process of formation of rational regional division system, its essence is to integrate isomorphic industry resources to set up industrial chain of division of cooperation, therefore, industry integration is the core of regional economic integration.

2.1 Complementary structure is the foundation for the development of the industry integration

Fundamental motivation of industrial integration lies in integrating resources around. According to the theory of division of labor, because of the existence of comparative advantage and scope economy, complementary industrial structure will facilitate the formation of geographical division of labor, which in turn led to the development of the integration industry. From the better integrated development of industrial area, integration process in the region with complementary industrial structure will be faster. In our case, in

most region proposing to promote urban agglomeration and metropolitan construction, there is a certain complementarity between industrial structure.

2.2 system building is the guarantee for promoting industry integration

Whether it is government-led or market-oriented, the government improve the policy environment of integrated development through system construction, which will play a very important role in promoting the integrated development of industries . On the one hand, institutional guarantee of integration can break barriers and reduce regional transaction and transport costs of integration to promote the rational flow of factors. On the other hand, , coordinated development of regional integration can be achieved and the efficiency of resource use can be enhanced through integrating resources.

2.3 Division of labor and cooperation is the main way of the industry integration

Specific methods of industry integration include industrial cooperation and division. The possibility of division of labor is determined by objective differences of development foundation and conditions between different cities while the necessity of the industrial division of can be explained by the theory of geographical division of labor.

3. Industrial structure convergence analysis of Bohai Economic Rim

In this paper, the industrial structure similarity coefficient is adapted to make a quantitative analysis of the industrial structure convergence of Bohai economic circle.

3.1 Analysis method

This article adopt industrial structure similarity coefficient based on distance discrimination method and its calculation formula is

$$S_{ij} = \frac{\sum_{k=1}^n (X_{ik} X_{jk})}{\sqrt{\sum_{k=1}^n X_{ik}^2 \sum_{k=1}^n X_{jk}^2}}$$

$$0 \leq S_{ij} \leq 1$$

In the formula, X_{ik} and X_{jk} respectively refers to the proportion of industrial sector k in region i and j and S_{ij} stands for similarity coefficient of industrial structure in two regions.

When S_{ij} equals 1, the two industrial structures are completely the same; When S_{ij} equals 0, the two industrial structures are completely different; In general, S_{ij} is between 0 and 1 and if S_{ij} is a higher value, the two industrial structures are more similar. On the contrary, S_{ij} is a smaller value, the two industrial structures are more dissimilar.

It is judged based on experience that usually when we are judging similarity of industrial structure, we use 0.85 to determine which one is higher. When it is compared in various parts of a country, for difference between regions is not that big than it is between countries, the judgment criteria of similar coefficient would be raised to 0.90

3.2 calculation results and its analysis

According to computed result (figure 1), Only Tianjin and Liaoning has a high industrial structure similarity in 2014 with a coefficient of 0.9069 which exceeds the regional experiential value 0.9 and there exists industrial convergence to some extent. The industrial structure similarity coefficient between other provinces and municipality is smaller than 0.9 and industrial structure similarity coefficient between Beijing and Hebei is under 0.5 which is 0.2965. It shows that industrial structure convergence in Bohai economic rim mainly exist in third industry while it rarely exists in meso level of manufacture industry.

Figure 1 Manufacturing industrial structure similarity coefficient in 5 provinces and city in Bohai economic rim from 2010 to 2014

year	Beijing to Tianjin	Beijing to Shandong	Beijing to Shandong	Beijing to Liaoning	Tianjin to Hebei	Tianjin to Shandong	Tianjin to Liaoning	Hebei to Shandong	Hebei to Liaoning	Shandong to Liaoning
2010	0.8393	0.3652	0.5823	0.6410	0.7749	0.6893	0.8406	0.5474	0.7178	0.7068
2011	0.7738	0.3612	0.5966	0.6474	0.8446	0.6422	0.9142	0.5491	0.8522	0.7414
2012	0.8052	0.3663	0.6914	0.6589	0.8234	0.7665	0.9180	0.6244	0.8604	0.8261
2013	0.7296	0.3127	0.6186	0.6683	0.8450	0.7277	0.9218	0.6153	0.8634	0.7625
2014	0.6764	0.2965	0.5832	0.6735	0.8573	0.6948	0.9069	0.5874	0.8505	0.7361

data sources: calculated by related data of statistical yearbook in 5 provinces and city

But from the perspective of the longitudinal comparison, industrial structure similarity coefficient between five provinces and municipality in the Bohai Economic Rim from 2010 to 2014 is showing a trend of expansion. It shows that industrial structure similarity coefficient in Bohai Economic Rim shows convergence to some extent according to cross-sectional data of meso level, but according to the dynamic changing trend, there is increasing tendency on the industrial structure similarity coefficient between five provinces and municipality in the Bohai economic rim.

4. Analysis on cooperation development restrictions of industrial integration in Bohai Economic Rim

In recent years, industrial integration in Bohai economic rim has made positive progress, but compared with the Yangtze River Delta and Pearl River Delta, it shows a relatively low level of industrial integration. Poor coordination of industrial development, flow of production factors, and allocation efficiency is quite conspicuous problems. Cooperation and development of industrial integration is facing subjective and objective constraints.

4.1 Massive separation in regional development

Compared with geographical divergence uniform type of the Yangtze River Delta and

Pearl River Delta, five provinces and municipality in the Bohai Sea region geographically coexist in the same area, next to Beijing and Tianjin, two adjacent geographical central cities, and they have a highly complementarity in factor endowments. Geographical adjacency and complementarity of resources provide great convenience for economic cooperation in Bohai economic rim.

4.2 Regional industrial development convergence

There is industrial structure convergence in Bohai economic rim to some extent and an increasing trend in isomorphic degree. In addition that there are steel, chemicals, equipment manufacturing, automobile and other traditional industries in the majority of provinces and cities, marine outfall is required for high-tech industries such as electronic information, biological pharmacy, new materials.

4.3 Institutional and ideological barriers

Since there is a larger proportion of state-owned economy in Bohai economic circle, its development is deeply influenced by traditional planned economy. Deep mindset formed under the traditional system is still not completely eliminated and concepts of waiting, depending and requiring remain as well. It consider that the industrial integration is mainly

implemented through plan made by government and rely on supportive policy and industrial investment while paying main attention on waiting for policy, investment and national projects at work.

5. Approach and suggestion on cooperation and development of industrial integration in Bohai economic rim

In fact, cooperation and development of industrial integration in Bohai economic rim is the optimization and upgrading of industrial structure of regional integration. From the "economic man" perspective, industrial structure convergence and development imbalance come into shape driven by seeking for maximum interest. Therefore, cooperation and development of industrial integration in Bohai economic rim should be established on the basis of interest and is strategic choice driven by interest.

5.1 Further change the concept of industrial integration

Cooperation and development of industrial integration in Bohai economic rim should follow the rules of market economy and take the market-leading and government-driven development model. Five provinces and municipality in the region should set up the concepts of cooperation in the competition and seeking win-win cooperation, abandon the concepts of waiting, depending and requiring and can not be too independent on policy support.

5.2 Build system to promote industrial integration development

Fully stimulating the initiative of promoting cooperation and development of industrial integration by five provinces and municipality in Bohai economic rim and several market entity is the foundation to promote industrial integration development in Bohai economic rim. We should pay close attention to the establishment of cooperation and development coordination mechanism leading by Beijing city which is explicitly stipulated in

Outline for Cooperation and Development in Bohai Sea region and make full use of the mechanism.

5.3 Optimize the industrial layout and division system in Bohai economic rim

Give full play to a macro guiding role of the government on industrial division and cooperation, eliminate regional protectionism, redundant construction and other issues and break down uneconomical industrial development caused by administrative barriers. We should also follow the ideas of industrial clusters and market-oriented allocation of resource, break administrative boundaries, and promote the flow and concentration of industrial resources within the region to form differential positioning in different region. Finally form complete industrial chain and cluster within the region and enhance the relevance and the agglomeration of local industries.

6. Conclusion

Accurately position city functions in the area and reasonably determine its leading industries. Major central cities in Bohai area should focus on the transformation of modern service industry and high-end manufacturing industries, speed up the transfer of outdated capacity and strengthen the very core driving ability. Other cities should promote the efficient concentration to the area with comparative advantage based on the existing natural resources of their own advantages, foster regional superior industries and implement "dislocation development" strategy to form a rational layout and scientific division of the industrial division of labor system.

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