

Simple Analysis on Industry Selection and Countermeasures Study During Chongqing's Undertaking Industrial Transfer Under Low-Carbon Economy Horizon

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Abstract

In the 1980s China Eastern coastal areas with its coastal superior position and special policy of opening go in attracting foreign capital in the front row, and the foreign capital which is from the developed countries or regions to industry greatly promoted our eastern coastal economic development in the areas. Today, the industrial transfer to the western region is developing in China, Chongqing as the western region only municipalities, in the process of undertaking industrial transfer if there is only undertaking without selection, and the blind industrial transfer or industry selection transferred are unreasonable, they will negatively affect the development of this region. Therefore, in this article it must be pointed that is to carry out the Low-carbon industrial transfer, the industry strategy selection must be implemented first, and relevant countermeasures and suggestion are proposed in the end of article, which indicate that Chongqing shall strive to promote the low-carbon industrial undertaking, increase the adjustment and upgrading of Chongqing's industrial structure, and actively impel the sustainable and coordinated development of economical, social and ecological environment of this region.

Key words: Low-carbon economy; Industry transfer; Industry selection; Countermeasure study

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INTRODUCTION

The Fifth Plenary Session of the Eighteenth Central Committee of the Chinese Communist Party held on October 26, 2015 pointed out: To solve development problems, root development advantages, we must firmly establish and earnestly implement the innovative, coordinated, green, open and shared development philosophy. We must adhere to the basic state policy of resource conservation and environmental protection, adhere to the sustainable development, and firm the civilized development road of production development, affluent life and good ecology, accelerate the construction of resource-saving and environment-friendly society to form a new pattern of modernization construction with the harmonious development between human and nature. We must promote the establishment of green low-carbon industrial system with cycle development, and promote the low-carbon cycle development.

After the Fifth Plenary Session of the Eighteenth Central Committee, Chongqing immediately launched the "13th Five Year Plan" planning and establishment work, and believed that the focus of the establishment work should firmly grasp the development path of eight aspects, among which, the "industrial restructuring, innovation-driven and strengthening of ecological civilization" requires special attention in the eight development path. Thus, Chongqing shall incorporate the development philosophy of low-carbon economy in the process of industrial transfer, and make the appropriate industry selection during the undertaking, in order to promote the

coordinated development between the sustained economic growth and ecological environment in this region.

1. LOW-CARBON INDUSTRIAL TRANSFER

Low-carbon economy is a “future-oriented” mode of economic development, while industrial transfer is a business-led economic activity. Is it possible to integrate the concept of low-carbon economy with the industrial transfer to promote the sustained driving force for coordinated development between the economy and environment in this region? The author believes that the answer is yes. Low-carbon economy is an economic model based on low energy consumption, low emission and low pollution. Its essence is to improve energy efficiency and create clean energy structure, and the core is the technological innovation, system innovation and transformation of the development concept. The industrial transfer refers to a phenomenon or process that some industries in a country or region transfer to other countries or regions due to the change in resource supply or demand conditions, and its essence is the inter-regional investment and transfer of enterprises.

The low-carbon industrial transfer is formed after the comprehensive understanding of two concepts, the low-carbon economy and industrial transfer. During the industrial transfer, the low energy consumption, low pollution and low emission should be regarded as the development mode of industrial transfer; the industrial transfer should be linked with the complementation and upgrade of the industrial structure in this region; and the economic development should be coordinated with environmental protection. Therefore, the author believes that the low-carbon industrial transfer is to undertake the industries that should be transferred according to the low-energy consumption, low-pollution and low-emission requirement in low-carbon economy after selection, and promote the industrial transfer process with the target of the coordinated and sustainable development between the economy and ecological environment in this region.

2. NECESSITY OF CHONGQING'S LOW-CARBON INDUSTRIAL TRANSFER

For whether Chongqing, the only direct-controlled municipality in western region, can take the lead in achieving the goal of building a moderately prosperous society, and promoting the healthy and sustainable development of economy, society and environment in the region, the low-carbon industrial transfer is particularly important.

2.1 Needs of Industrial Restructuring

Chongqing must first consider whether the industries it undertakes have the effect of adjusting the industrial structure in Chongqing during the low-carbon industrial

transfer. On this issue, we first analyze the industrial structure in Chongqing, as a basis for industry selection. Throughout the development history of Chongqing, Chongqing is an old industrial base, and has always been based on manufacturing, thus creating a second industrialized urban development pattern. Through the longitudinal analysis of Chongqing's industrial structure in 2005-2013, we are able to put forward valuable suggestions in the industrial selection process of Chongqing.

Table 1
Data Sheet of Three Main Industries in Chongqing (2005-2013)
 (unit: 100 million yuan)

Year	Gross regional domestic product	The primary industry	The secondary industry	The tertiary industry
2005	3467.72	463.40	1564.00	1440.32
2006	2907.23	386.38	1871.65	1649.20
2007	4676.13	482.39	2368.53	1825.21
2008	5793.66	575.40	3057.78	2160.48
2009	6530.01	606.80	3448.77	2474.44
2010	7925.58	685.38	4359.12	2881.08
2011	10011.37	844.52	5543.04	3623.81
2012	11409.60	940.01	5975.18	4494.41
2013	12656.69	1002.68	6397.92	5256.09

Data source: 2005-2013 Chongqing Statistical Yearbook.

Note. GRP per capita in this sheet is calculated by permanent population.

By the above table, we can understand that from 2005 to 2013, the production value of three major industries in Chongqing all showed a steady upward trend. By 2013, the total output value of the primary industry in Chongqing reached 100.26 billion yuan, with a share of 7.9%; the total output value of the secondary industry was up to 639.792 billion yuan, with a share of 50.5%; the total output value of tertiary industry was 525.609 billion yuan, taking up a share of 41.6%. We found that the structure three major industries showed significant “231” structure model, in which the primary industry accounts for the smallest proportion, basically remaining at 7%-10% level after 2006; the proportion of secondary industry ranks first in three major industries, basically at a leading position of 50% since 2007; the proportion of tertiary industry in GRP is largely unchanged at about 40%.

Therefore, we found that Chongqing presents a “231” industrial structure model, and should be gradually adjusted to the “321” pattern of industrial structure, driving the sustained regional economic growth by the development of the tertiary industry while promoting the development of the primary and secondary industry.

2.2 Needs of the Coordinated Development of Economy and Environment

With the increasing scale of industrial transfer Chongqing undertakes, we cannot pursue the economic development unilaterally, but should pay more attention to the ecological value during the industrial transfer.

In the process of low-carbon industrial transfer, we should replace the development concept of original one-side pursuit of economic growth by economic and environmental coordinated development concept. By comparing Chongqing industrial structure, we can also understand that the total output value of the secondary and tertiary industry in Chongqing occupy the most shares. However, the secondary industry in Chongqing is mainly concentrated in the manufacturing sector, such as conventional car, motorcycle, polyvinyl alcohol fiber, chemical and other related industries, while these traditional manufacturing industries will inhibit the realization of ecological value in Chongqing's industrial transfer to some extent. Therefore, Chongqing should strive to promote the low-carbon industrial transfer to achieve the double objective of ecological value and economic value in the process of low-carbon industrial transfer in the future.

3. INDUSTRY SELECTION IS THE PREREQUISITE FOR LOW-CARBON INDUSTRIAL TRANSFER

The industrial transfer rising in the 1980s has brought the rapid socio-economic development to eastern China. Nowadays, the industrial transfer gradually shifts to the western region, showing the characteristics of a shift from low value added to high value added and the expansion from the simple manufacturing to the whole industry chain. So, faced with the new characteristics emerging in the industrial transfer, the old concept of industrial transfer shall be changed, and industry selection must be regarded as the prerequisite for low-carbon industrial transfer.

3.1 Industry Selection

There are mainly two concepts related to the industrial selection in the academia: one concept is that the industry selection is mainly to determine the leading industries of this region through the industrial structure and economic development characteristics of a region; and the other understanding is that the industry section is a process to select industries through observing the comparison of entry costs and expected benefits in different industry selection in the country and region.

The author believes that the industry selection is a necessary prerequisite for low-carbon industrial transfer, and is a process to selectively transfer industries according to the guidance of low-carbon economic development concept, the needs to adjust and upgrade the industrial structure of this region as well as the requirements of economic growth and coordinated development between the social and ecological environment. At the same time, the author considers that the industry selection should be carried out continuously no matter in the early, middle and later period of

industrial transfer, and it runs through the whole process of industrial transfer, and remains a two-way interactive relationship with the industrial transfer. In order to achieve the target of low-carbon industrial transfer, the industry selection must be implemented first.

3.2 Principle of Industry Selection

Undertaking industrial transfer is an important approach to promote the upgrading of the industrial structure in this region, and is also an important part of pushing the sustainable economic development of this region. In the process of undertaking industrial transfer, if there is only undertaking without selection, and the blind industrial transfer or industry selection transferred are unreasonable, they will negatively affect the development of this region. Therefore, the following several principles shall be abided by the industry selection.

3.2.1 Industrial Gradient Principle

In the industrial transfer, only the industries with a certain gradient comparative advantage compared to other regions can be transferred to other low-gradient areas under the governance of gradient transfer rules. The industrial gradient advantages mentioned here include both the holistic strategic advantages promoting the industrial development and the regional special resources, unique technology and other local characteristics and advantages relied on by industrial growth and expansion. The industrial gradient advantages are relative to the comparative gradient advantages that possible target transition region possesses. As a result, during the low-carbon industrial transfer, Chongqing should be good at applying the industrial gradient transfer principle. And the selection of industries it undertakes shall focus on the industrial gradient higher than Chongqing, in order to promote the industrial development of the region, and constantly optimize the industrial structure of this region.

3.2.2 Undertaking Suitability Principle

The reason why the industry can flow and transfer between regions ultimately comes from the existence of competitive advantages in a region. However, with respect to competitive advantages, we should consider the problem of suitability, that is, whether the undertaking region to match its basic situation with the actual needs of specific industries when considering carrying on industries. Meanwhile, the introduction of industries and application of technology are conditional. The advanced does not mean the applicable, and whether it can be absorbed, digested by the undertaking region and promote the enhancement of innovation capability is the most critical. Hence, Chongqing, as the undertaking region, must consider the suitability during undertaking the industry selection, and gradually enhance and promote the competitive advantages from the objective conditions to subject ability, thereby stimulating the development of the whole industry in Chongqing.

3.2.3 The Principle of Industrial Coordination Development

In the process of undertaking the industrial transfer, based on the principle of combination of regional economic development program and the industrial development plan, on the one hand, the industry selected to undertake should be coordinated with the national and regional industrial development policy, and never undertaking the overcapacity industry with national and regional restrictions. On the other hand, starting from the development of regional industrial clusters, the industry with agglomeration trend should be primary undertook to concentrate on cultivating a number of industrial clusters as the economic growth to promote economic development in the region. Chongqing should take full account of the existing industrial structure, and combine with its own industrial structure characteristics and the future change tendency of industrial structure to mainly undertake transfer favorable to the automobile and motorcycle, equipment manufacturing, material industry and high-tech industries, and also undertake some industries highly related to some original industrial clusters, so as to improve the regional industrial chain and promote the coordinated development of the industry.

3.2.4 Sustainable Development Principle

The sustainable development was first proposed in 1972, and refers to an economic development mode meeting the needs of contemporary people without compromising future generations to meet their capacity, which is a kind of "strategic and forward-looking" model of economic growth. Chongqing Mayor Huang Qifan has said that Chongqing is not welcome industries with heavy pollution and large resource consumption. For this reason, in the selection of transfer projects, Chongqing shall take the coordinated and sustainable development of the economy, society and environment of the undertaking region as an important selection criteria to undertake industries. Industries with large resource consumption and heavy pollution can never be undertaken. The ecological and social benefits cannot be ignored while only pursuing regional GDP growth. Therefore, in the selection process, the undertaking of resource and environmental protection industries can be selected in priority, and tax collection and management shall be increased or energy saving transformation shall be conducted for the enterprises with heavy pollution, so as to achieve the maximum economic, social and ecological effects.

3.3 Analysis on Chongqing's Industry Selection

According to the analysis on concepts related to the industry selection and four principles that shall be followed in the industry selection of Chongqing, we are able to understand: The industry selection is the "safety valve" to achieve the low-carbon industrial transfer.

First, based on the industrial gradient principle, Chongqing shall use the industrial gradient coefficient

in the industry selection to measure whether the industry has the comparative advantages for undertaking. The formula is:

$$LGC = LQ \times CCOR \times CPOR .$$

Where, IGC is the industrial gradient coefficient, LQ is the location quotient, CCOR is the comparative capita output ratio, and CPOR is the comparative product output ratio. Therefore:

$$CCOR = \frac{\text{Proportion of regional industrial added value in the national added value of the industry}}{\text{Proportion of regional average industry capital in the national average capital of the industry}}$$

$$CPOR = \frac{\text{Proportion of regional industrial added value in the national added value of the industry}}{\text{Proportion of regional industrial employees in the national employees of the industry}}$$

Therefore, when the industrial gradient of a industry in Region *i* is less that that in region *j*, namely, $IGC_i \geq IGC_j$, it shows that the advantages of the industry in Region *j* are superior to that in Region *i*, and it necessary to transfer the industry to Region *i*. Hence, the industrial gradient of Chongqing is compared with that of Guangdong Province, Zhejiang Province and Shanghai in this article, and it is concluded that the textile, garment, footwear, headgear manufacturing index of Chongqing is 0.37, lower than 1.02 of Guangzhou Province, so Chongqing should undertake the textile, garment, footwear, headgear manufacturing industry and so on; the electronic machinery and equipment manufacturing industry index of Chongqing is 0.58, lower than 1.26 of Zhejiang Province, so Chongqing should undertake the electronic machinery and equipment manufacturing industry of Zhejiang Province; Chongqing is lower than 1.43 of Shanghai in the petrochemical industry index by 0.11, so it should undertake the petrochemical industry of Shanghai.

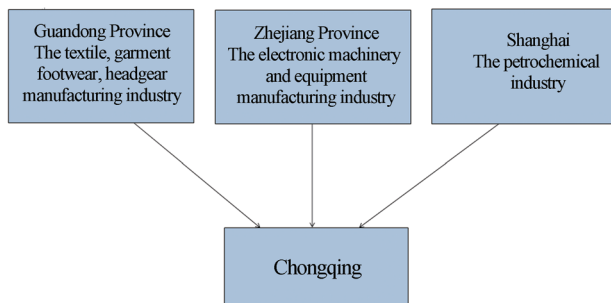


Figure 1
Chongqing Shall Undertake the Industry Has the Comparative Advantages

Secondly, according to the undertaking suitability and industrial coordination principle, Chongqing shall strive to develop the tertiary industry, actively promote the transformation development of the secondary and primary industry, vigorously promote the industrial structure to develop towards the "321" pattern. Thus,

Chongqing shall focus on considering the general equipment manufacturing, transportation equipment manufacturing, communication equipment, computers and electronic equipment manufacturing industry in the process of future industry selection, and enhance the ability to use science and technology for innovation to promote the development of chemical materials, chemical products manufacturing industry, coking and nuclear fuel processing industry.

Finally, Chongqing shall, in strict accordance with the principle of sustainable development of economy and ecological environment, strictly inspect the emissions of three industrial wastes and the carbon emissions of undertaking industries, and calculate the energy consumption per unit as an important indicator for industry selection. As a result, Chongqing shall put emphasis on observing relevant indicators of the chemical fiber manufacturing, electricity, heat production and supply industry, chemical raw materials and non-metallic mineral production industry, papermaking and paper product industry, non-metallic mining industry and non-ferrous metal metallurgy and other industries during the industry selection, and strictly control the standards of three wastes and carbon emissions of above industries, in order to promote the sustainable development of economic, social and ecological environment in Chongqing.

4. COUNTERMEASURE STUDY OF CHONGQING'S LOW-CARBON INDUSTRIAL TRANSFER

On the basis of theoretical discussion and realistic analysis of Chongqing's low-carbon industrial transfer and industry selection, relevant countermeasures and suggestions are proposed in this article to promote the regional low-carbon industrial transfer in Chongqing.

4.1 Enhance the Regional Industrial Undertaking Capability

The industrial undertaking capability of these regions shall be enhanced. First, Chongqing should strive to develop the construction of roads, railways, shipping, river transport, communications, energy and other infrastructures, providing more convenient channels for the material and personnel flow in the industrial transfer. The interoperability between Chongqing and other neighboring provinces, especially the construction of quick passage to coastal provinces and cities, shall be strengthened, and the establishment of the national fifth-largest transportation hub shall be accelerated. At the same time, Chongqing shall take full advantage of the power resources, water resources, natural gas and other natural resources, providing convenient survival and development conditions for the low-carbon industrial transfer. Second,

Chongqing shall give full play to the superiority of low-cost labor resources, and on the basis, strengthen the education and training and enhance the overall quality of human resources. Finally, Chongqing shall strengthen communications to create a good institutional environment, integrate information resources, speed up the construction of information infrastructure, strengthen information security and build a complete information technology industrial chain. Meanwhile, the institutional environment building of the undertaking placement shall be focused on to form a fair and competitive market environment, create a mature and steady institutional environment and constantly enhance the promotion of the undertaking capability of this region.

4.2 Exert the Industrial Cluster Effects

Industrial clusters can efficiently promote the development of scale effects, lower labor costs and form the pattern of "resources + advantages", promote the accelerated flowing of technology information in the market, and effectively realize the region's economies of scope. Chongqing shall take the advantage of its old industrial base, and create well-known industrial clusters. Within the national policy framework, Chongqing shall combine with its own development needs, create its own industrial clusters according to its local conditions, make full use of the Yangtze River "golden waterway", "Chongqing-Europe" international railway lines and other advantageous conditions to absorb incidental industry with clustering effects and innovate the development model of industrial clusters, providing the boost power for the development of industrial clusters in Chongqing. In addition, while introducing large pillar industries, Chongqing shall pay attention to the undertaking of related support enterprises, and for industries that have not yet formed clusters, shall introduce various relevant support enterprises to gradually build the new industrial clusters, and actively create competitive automobile and motorcycle industry clusters, gas oil and chemical industry clusters, equipment manufacturing and high-tech industry clusters, etc..

4.3 Focus on the Adjustment and Upgrading of Industrial Structure

Chongqing is China's old industrial base with good industrial base and more developed manufacturing. The development level of the primary industry lags behind, while the development level of the tertiary industry is difficult to be comparable to the developed regions. Thus, Chongqing shall, based on the characteristics of its industrial structure, first intensify the investment to the primary and tertiary industry, and guide the development of the primary and tertiary industry with the subsidies and referential tax and other incentive policies while introducing advanced science and technology to promote

the agricultural technological level. Secondly, Chongqing shall rely on the absorption and transformation of advanced technology to enhance its own independent innovation and research ability, and gradually narrow the industrial differential. Finally, Chongqing shall strive to develop modern service industry, develop and nurture new financial industry; rely on convenient transportation in Chongqing, optimize warehouse and distribution operation, and vigorously develop modern logistic industry; rely on rich tourism resources in Chongqing to improve relevant tourism infrastructures and promote the chain development of tourism industry; enhance the international visibility of Chongqing, increase propaganda work, perfect exhibition-related support facilities; promote the development of exhibition industry, in order to continuously adjust the industrial structure of the region, promote industrial upgrading and guide the coordinated development of three major industries.

4.4 Promote the Coordinated Development of Undertaking Industry and Ecological Environment

Resource constraints and environmental pollution have become major obstacles to restrict the social and economic development today. As a result, in the process of low-carbon industrial transfer, the screening and selection of industries must consider the ecological cost issue and put emphasis on ecological benefits. Therefore, during undertaking industrial transfer, Chongqing must first strictly examine the industrial transfer project, build scientific examination and assessment indicators, take the scientific and technological content, environmental protection indicators and economic growth indicators of the project as the main assessment indicators, strengthen the assessment management of the project, and screen according to the actual situation of the industry for transfer, and resolutely reject the project or industry with large energy consumption, pollutant emission and non-compliance to standards. Second, Chongqing shall establish and improve the environmental protection law, develop the fields and projects with encouraged, restricted or inhibited investment, and build relevant policies to actively encourage the entry of new areas that are able to promote the economic and environmental sustainable development, such as the clean energy industry, environmental protection industry, clean technology industries and so on. Finally, Chongqing shall actively foster the concept of harmonious development between human and nature to gradually form low-carbon life and consumption habits, guiding the formation of the low-carbon development concept and promoting the achievement of Chongqing's low-carbon industrial transfer target.

CONCLUSION

In this article, based on the understanding of the low-carbon economy and industrial transfer concept, the conception of integrating the low-carbon economy with industrial transfer, namely the low-carbon industrial transfer, was proposed. Through the necessity for Chongqing to conduct the low-carbon transfer, we can know that to carry out the low-carbon industrial transfer, the industry selection must be implemented first. Then according to the principle of industry selection, an analysis on the industry selection of Chongqing was detailed, and relevant countermeasure was put forward through the analysis results for the low-carbon industrial transfer of Chongqing. It is believed that Chongqing shall strive to promote the low-carbon industrial undertaking, increase the adjustment and upgrading of Chongqing's industrial structure, and fight for achieving the optimization of industrial structure enhance the regional independent innovation ability, strengthen the scale benefits of industrial clusters, and actively impel the sustainable and coordinated development of economic, social and ecological environment of this region.

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