ANALYSIS OF THE INDUSTRIAL STRUCTURE OF GANSU PROVINCE IN THE NEW INDUSTRIALIZATION ADVANCEMENT

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ABSTRACT

Gansu Province located in the northwest of China, with a special location. Due to the implementation of the West Development strategy, the study on the constraints in the new-type industrialization in Gansu Province is significant. According to the industrial data of Gansu industrialization, it indicates that the outstanding issues which can promote Gansu industrialization includes the industrial economic structure, dual economy, resources and ecological environment, the labor quality. It is also suggested that the implementation of the sustainable development strategy, the target of “strong industrial province” can provide theoretical bases for the decision of Gansu new-type industrialization based on the informationization, labor force and policy.

INTRODUCTION

Industrialization not only belongs to an economic category, but also belongs to a historical category. Industrialization is a transition progress from the agricultural society to the modern industrialized society. It means the economic focus shift from the agricultural production to the manufacturing production. The so-called new-type industrialization is to insist on using informatization to stimulate industrialization, and using industrialization to promote informatization. It is a kind of industrializations with advanced technology, good economic benefit, low resources consumption, little environmental pollution and optimized human resource. New-type industrialization is a kind of industrializations with low consumption decline, and the industrial structure ceaselessly turns more reasonable and advanced. Therefore, the adjustment and upgrade of the industrial structure are the most significant part of new industrialization. The research on Gansu new-type industrialization should be done after evaluating the overall development level of Gansu industrialization. Base on the development economics, to observe an industrialization stage of a country or an area depends on the relations between the per capita income levels and income structure variations. The per capita income is ranged from $220 to $550 means the industrialization enter the initial stage, from $560 to $1120 means the industrialization enter the mid-stage, and from $1120 to $2100 means the industrialization enter the mature stage. However, it’s only a overall reflect of the industrialization level, and can not comprehensively reflect the industrialization of a country or an area. Based on the index system created by H.Chenery, the degree of Gansu industrialization development is evaluated by the following indicators.

2.The total evaluation of the industrialization in Gansu province

The total evaluation of the industrialization include the proportion of gross national product (GNP), the GNP per capita, the ratio of the industrial added value to it in the three industries.

Table 1 Total evaluation of the industrialization in Gansu province from 2000 to 2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Gross national product (one)</th>
<th>Per capita gross national product(Yuan)</th>
<th>The added value of industrial</th>
<th>Industrial contribution rate</th>
</tr>
</thead>
<tbody>
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</table>
Analysis of the Industrial Structure of Gansu Province in the New Industrialization Advancement

<table>
<thead>
<tr>
<th>year</th>
<th>The ratio of the three industries output (%)</th>
<th>The ratio of the three industries employment (%)</th>
<th>The ratio of the Light and heavy industrial (%)</th>
<th>Urbanization rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>18.48: 40.70; 40.82</td>
<td>59.4: 13.4: 27.2</td>
<td>31.63</td>
<td>24.01</td>
</tr>
<tr>
<td>2002</td>
<td>17.49: 40.72; 41.79</td>
<td>59.5: 13.4: 27.1</td>
<td>30.43</td>
<td>24.51</td>
</tr>
<tr>
<td>2003</td>
<td>17.00: 40.86: 42.14</td>
<td>59.0: 13.6: 27.4</td>
<td>31.71</td>
<td>25.96</td>
</tr>
<tr>
<td>2004</td>
<td>16.99: 42.24: 40.77</td>
<td>58.5: 13.8: 27.7</td>
<td>31.71</td>
<td>27.38</td>
</tr>
<tr>
<td>2005</td>
<td>15.93: 43.36: 40.71</td>
<td>57.2: 13.7: 29.1</td>
<td>24.03</td>
<td>28.61</td>
</tr>
<tr>
<td>2006</td>
<td>14.67: 45.81: 39.53</td>
<td>56.4: 13.9: 29.7</td>
<td>23.1</td>
<td>30.02</td>
</tr>
<tr>
<td>2007</td>
<td>14.33: 47.31: 38.35</td>
<td>54.4: 14.4: 31.2</td>
<td>18.87</td>
<td>31.09</td>
</tr>
<tr>
<td>2009</td>
<td>14.71: 44.67: 40.62</td>
<td>52.6: 14.6: 32.9</td>
<td>17.96</td>
<td>32.15</td>
</tr>
<tr>
<td>2010</td>
<td>13.51: 50.28: 36.21</td>
<td>51.1: 15.1: 33.8</td>
<td>17.84</td>
<td>32.65</td>
</tr>
</tbody>
</table>

(Source from "Gansu Statistical Yearbook" (2000-2010))

3.1 Industrial structure evaluation

In accordance with the development process of industrialization in developed countries from 2001 to 2020, "In a region with the completed industrial and agricultural production system, the ratio of the initial stage of the industrialization is 35:35:30, and the ratio of the advanced stage and three industries is 4:35:61 ". Ten years statistics show that the industry structure of Gansu province shows "two, three, one" characteristics in the latter 10 years. That is to say, the proportion of the primary industry declines, and there is a slight upward trend in the proportion of secondary industry, and the proportion of the tertiary industry increases in wave. Above all, the secondary industry is one of the major factors in stimulating the economic growth in Gansu province, but the primary industry becomes one of the restriction factors.

3.2 Employment structure evaluation

Another important indicator to measure the industrial structure is the employment structure. According to "Petty - Clark "theorem, with the economic development, the labor force firstly migrate from the primary industry to the secondary industry. After further development of economy,
the labor force begin to migrate to the tertiary industry. The distribution of the labor force in the three industries decreases in the primary and secondary industry, and increases in the tertiary industry. For the structure of employment, the labor force proportion distribution in the three industries in Gansu Province shows "one three two" mode. The Gansu Province ratio of the employed labor force in the primary, secondary and tertiary industries is about 51.1:15.1:33.8. The ratio of the rural population in the total population is approximately 67.4%. This shows that the excessive labor forces stay in the primary industry and rural area, and the labor forces in the secondary and tertiary industries is obviously insufficient. It indicates the characteristics of the urban-rural dualistic economic structure still exists and is very obvious.

Based on the change trend of the employment and industrial structure, the level of the employment structure in Gansu province lags behind the level of the industrial structure. According to the data calculation, it can be seen that the employment proportion in the primary industry decreases by 8.3%, from 59.4% in 2001 to 51.1% in 2010, while the output value proportion in the primary industry dropped from 19.3% in 2001 to 13.51% in 2010. The output value proportion was too small, but the employment proportion was too large in the primary industry. It indicates that the employment structure in the primary industry was still lagging, and problems of the surplus labor forces highlighted.

The number of employees in the secondary industry in problems of industrialization (especially heavy industrialization), industrialization also shows the optimization of the internal structure. It is known as "rule of industrialization experience", which also called Hoffman theorem or Hoffman rule. It shows that in the early industrialization, the industrial structure is given priority to light industrialization with lower level of processing, but with the development of industrialization the industrial structure is given priority to heavy chemical industry and machinery processing industry with the higher level of processing. The proportion of the heavy industry in Gansu province decreased gradually, from 31.63% to 17.84%. Especially in 2006, the data decrease clearly faster, from 23.1% to 17.84% in 2005. These data fit the rule of Hoffman and the previous analysis.

3.4 The urbanization level of Gansu province
Industrialization needs certain fundamental conditions including the level of urbanization also called urbanization rate. H. Chenery had summarized the relationship between the industrialization and urbanization rate. In the preparation stage of industrialization, the urbanization rate Gansu province rose from 13.4% in 2001 to 15.1% in 2010, only increased by 1.7%. The output value proportion in the secondary industry increased from 40.7% in 2001 to 50.28% in 2010. Although variation trends of the employment and the output value were the same, and both increased, there still existed problems that the proportions of employment and output value were seriously disproportionate. That is because of the distribution of industry in Gansu province. The major industry in Gansu province was a heavy industry, which was a capital intensive industry, and its developed trend depends on the capital and technology instead of the labor force. That is the reason why the proportions of employment and output value were seriously disproportionate in Gansu secondary industry. As for the tertiary industry employment status, employment and output value both increase. The tertiary industry employment accounted for 27.2% in 2001, and 33.8% in 2010, and it increased by 6.6%. The proportion of the employment in Gansu primary industry declined by 8.3% from 2001 to 2010. The proportion of the employment in Gansu secondary industry only grew by 1.7%. It indicates that the surplus labor force transfers to the tertiary industry that absorbs labor force fastest.

3.5 The structure of foreign trade in Gansu Province
The new-type industrialization requirements further opening to the outside world, which can take advantage of two markets and two kinds of resources, the interaction between industrialization and internationalization. In general, the Gansu province import and export trade amounted to $7.325 billion in 2010, which accounted for the proportion of 0.25% in China. The import and export
the Primary industry, AG shows the proportion of the labor force of the primary industry. So we define the DI as follows:

$$DI = \sqrt{\frac{Ag'ag}{(1-Ag)(1-ag)}}$$

the larger of the level of DI, the higher of the degree of the dual structure. In 2000, the DI of Gansu province is 0.4073, compared with the national average 0.2546, so the degree of the dual structure is deeper. The data shows that the industry of Gansu lacks necessary horizontal collaboration inside, single resource intensive industries and primary processing methods limit the extension of the industrial chains seriously, it causes lower industrial division level and less industrial added value, slower process of the capital accumulation, weaker industrial competitiveness. Industrial structure adjustment is difficult that it cripples the role in promoting the regional economy and makes it harder to promote the efficiency of the comprehensive utilization of resources and to protect the ecological environment.

4.2 The restriction of resources and the ecological environment

With the reform and opening up policy of the western region, the western region employed resources fully for the economy advancement. It led to excessive exploitation of resources and serious environmental pollution and the destruction of the ecological environment. Say, in Gansu province, Grassland degradation is serious, water loss and soil erosion situation is still grim, land desertification is serious, dust storms are aggravated. In general, the wastewater, the waste gas emissions and the solid waste production of the industrial added value in Gansu in 2009 are 1.95, 2.52, and 3.15 times of the national average respectively.

4.3 The limitation effects of labor

According to the result of Fifth Population General Survey, people who are over 6 years old are educated for 7.7 years, while Gansu province is only 6.7 years. In the whole country of China, the Illiteracy rate in people over 15 is 9.08%, yet the rate of Gansu province is 19.68%. Most of the labors working at industrial business are doing primary jobs, and if one day they are dismissed, they would be difficult to adapt to other jobs. Many labors think staying at home is much better than working, and even if some of them work out, they feel rather stressed for the reason that they can not easily adapt to modern business requirements, climate change, multi-language atmosphere and their food tastes etc. The result is that some of them don’t insist on their previous choice and retreat to idle rural lives.

4.4 Constraints of industrial structure benefit

Economic evaluation index of industrial structure as a whole benefit level is the comparative labor productivity. Its
Formula is as follows:

\[ \text{Industrial Comparative Labor Productivity} = \frac{G}{L} \]

This formula represents the gross national product (GDP). G stands for the gross national product of the industry, and L represents the total workforce.

Li is the index of industry labor force.

In 2010, for example, Gansu province, the first industrial comparative labor productivity is 0.28, which is higher than the proportion of labor yet lower than the proportion of output value. The comparison of the second industry labor productivity is 3.21, which indicates that output growth enhances faster than labor force growth. The tertiary industry of comparative labor productivity is 1.21, which alleges that the labor force grows faster than the output growth. In this chosen time span, the average of the three values are 0.27, 1.63, 1.25, we may conclude that the second industry in Gansu province of comparative labor productivity than the national deviation is larger.

The higher level of economic development, per capita income level is higher; the first industrial comparative labor productivity and the second industrial comparative labor productivity ratio is bigger. In 2010, for example, the ratio of the first industrial comparative labor productivity and the second industry comparative labor productivity is 0.09. While the value is 0.16 across the country, this indicates that the economic development in Gansu province lag behind the other provinces of China.

From each area to examine the absolute values of the industrial comparative labor productivity, the second industry is the highest, followed by the tertiary industry. The more developed the area, the smaller the numerical value, backward area gets larger. Comparative labor productivity in three times, the smaller the gap between industry shows that the region’s industrial structure more reasonable, Structure of the benefit is better. In Gansu province in 2010, for example, in accordance with the law, and the data gap is significantly greater than the gap between the whole country. These combine together to show that the industrial structure of Gansu province is not reasonable and shows poor efficiency.

5. Reflections and Countermeasures of Industrialization in Gansu province

5.1 Improve the level of technology and develop the circular economy

Industry development in Gansu province seems to be the sacrifice of heavy energy inputs, raw materials production of energy-guzzling heavy industries, low energy efficiency and large energy consumption and serious pollution to the environment. Taking a new perspective of industrialization, we must firstly change people's ideas. Gansu province should change the traditional industrial economy with heavy resources appetite, improve the level of technology and develop the circular economy. The second, more investment on economic and technical, including the money and talents investment in technology of clean production, information technology, energy comprehensive utilization technology, energy technology, recovery and recycling technology, resource reuse and replacement technology, environmental monitoring technology, etc. Finally, given the eco-type enterprises preferential loan rates and provide technical assistance, foster eco-type enterprises, improve energy utilization, advocating green design, green production, green marketing etc.

5.2 Practice Strategic innovation to stimulate industrialization by IT

First of all, using information technology as the guide to promote and optimize traditional industry. To realize the integration and optimization of logistics and information flow, to improve the strain capacity and competitiveness of enterprises, the Gansu province should apply the IT products to the traditional industries vigorously, speed up the implementation of product upgrading and structural optimization of technological transformation, pay attention to the information technology and modern management technology and manufacturing technology combining importantly. Secondly, developing high-tech industries positively, lead the new Industrialization by high-tech. On the one hand, developing and expanding the existing high-tech industries continually, focusing on making mechanical and electrical integration, biological, pharmaceutical, etc. on a large scale, to further expand to other areas on the basis at the same time. Finally, improving the equipment manufacturing industry and the level of Technology, promoting the optimization and upgrading of industrial structure. Last but not least, to enhance the science and technology innovation ability of whole province by running high and new tech development zone, increasing scientific research development fund, and developing information network equipment and electronic products.

5.3 Improve the level of trade patterns

The existing trade patterns of Gansu province is disadvantageous to the transformation and upgrading of the industrial structure. From now on, we should reduce the export of primary products of the resource, invest direct funds to higher levels of general trade by making policy, increase the exports of technology-based mechanical and
electrical products, high-tech products, in order to drive the adjustment of industrial structure. Simultaneously, making good use of foreign capital and technology, encouraging the export of processing trade, transform the low level trade into a higher level of processing trade gradually.

5.4 Promote the industrialization process of rural district
Under the background of new era, the industrialization of Gansu Province cannot merely rely on moving rural labor by traditional industry, but base on the new development strategy of industrialization. On one hand, speed up the reform pace of township enterprises. The main task is to continue to strengthen the shareholding system reform of township enterprises, establish the modern enterprise system, thus to raise the level of industrialization by accelerating the modernization process of township enterprises. On the other hand, change from traditional agriculture to modern agriculture in the process of rural industrialization. Change of agriculture, an endogenous variable of rural industrialization, and its essence lies in the agricultural micro-economic subject system and technology selection for the pursuit of profit maximization of resources environment changes and market development conditions. Agricultural industrialization is an effective form to solve the contradictions of the small farmers and big market, is an effective way to increase farmers' income as well. For the sake of developing industrial management of agriculture, we need to develop various kinds of organization for economic cooperation, and build association of farmers, meanwhile foster some agricultural enterprises as leading sample.

5.5 Enhance the quality of the labor force
The core task of changing the labor force is the education level. The education reform system should strengthen the compulsory education of the labor force, reduce the illiteracy rate, thus make them highly qualified for their careers and positions. The government of Gansu province should raise the funding for training and reeducation, thus many labors should change to high-level-labor vacancies. Finally, equality of the payment system is rather essential. The salaries and benefits should be evaluated through the contributions and workload, those who make great contributions, input more creativity and energy should be awarded.

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REFERENCES