Research Focus on Supply-side Structural Reform in Northwestern Industrial City of China: Taking Baotou as an Example

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Abstract. Economy in China has been transformed from rapid growth to high-speed growth stage. Under the background of the new normal, China’s economic structure is in the situation of mismatch between supply and demand. President Xi put forward at the end of 2015: when moderately expand demand by following methods—decreasing productivity, destocking as well as deleveraging, deleting ineffective supply and reducing cost, we should strengthen supply-side structural reform at the same time. The quality and efficiency in supply-side structure are the power of sustainable economic growth. Thus, as the core of supply-side structural reform, cities are transforming supply-side structural reform from word to reality.

1. Introduction

With the development of reform and opening up, there are great changes in the patterns of demand and supply which make the structural contradiction increasingly outstanding. Due to the overproduction of low-end product and undersupplying of high-end product, the development of emerging industry and the technology innovation of product can’t satisfy the growing customer requirement. Consequently, “overseas purchase” and “global purchase” become more and more popular among people, which slow down the growth of domestic economy and industrial economy. Therefore, supply-side structural reform has become an important work in stimulating economic growth from now on. As the backbone of supply-side structural reform, not only do cities play an important role in adjusting and improving industrial structure; but also play an important part in perfecting the functions of urban complex.

2. The Definition of Supply-side Structural Reform

At the beginning of 2011, Jia kang and other scholars set up a “research group of Chinese new supply-side economics” and began to explore the new supply-side economics which can promote Chinese reform and development from supply side. Kang [1] points out that the supply-side structural reform is not only the innovation of uniting theory with practice, but also the re-innovation of power system which direct the problem-orientated new normal economy. It is also the innovation of long-planned global system engineering, and the innovation of system supply whose core is reform and backbone is modernization. Hongjie and Hui believe that supply-side structural reform focuses on the supply side, used to liberate productivity, encourage innovation spirit and improve competitiveness in order to expand the potential output to promote economic growth [2]. And the core of the supply-side structural reform is to reduce the cost of system. However, China chief accountant think that being different from the former demand-stimulating side, the supply-side structural reform comes back to source-growing innovation, emphasizes the system supply, and builds a new
developing system so as to release increasing bonus by exploding growth difficulties [3]. Pu Xiaolei indicates that supply-side structural reform is a useful way to promote economic development by emancipating the productive forces and increasing competitive power from the supply and production sides [4]. Liu Shijin puts forward that supply-side structural reform is not the alternative measure of “troika” [5]. It is used to create demands and solve problems in demands which are more reliable, more practical, and more sustainable.

In conclusion, the author thinks that the supply-side structural reform is used to shift the old concept which pays more attention to expanding demand, and create a new good policy atmosphere to encourage enterprises to implement safe, green, efficient and delicate operations. It boosts the sustainable economic growth by continuously innovating new products and services to better cater to the consumers’ demand.

3. The Comparation Based on Factor Analysis Among Main Northwestern Industrial Cities

3.1 The selection of indicators and samples

As the backbone of the supply-side structural reform, cities play an important role in different supply aspects, such as the regional economic foundation, capital inputs, labor inputs and total factor productivity. Considering the quantifiable degree of indexes, we can divide the indexes of supply-side structural reform into four dimensions, those are labor inputs, capital inputs and total factor productivity and urban economic base, which totally include 21 supply-side evaluation indexes. They are GDP, per capita GDP, social retail goods, industrial added value, local government fiscal revenue, proportion of second industry, all kinds of balance, number of Industrial companies, total investment in fixed assets, all kinds of loan balance, local government fiscal spending, percent of second industry in fixed input, number of college students, educational expense, proportion of secondary industry employment, proportion of tertiary industry employment, number of people in scientific research and technical services, expense in science and technology, fiscal expenditure proportion in science and technology funds, number of application in patent and number of patent licensing. In this writing, through the contrast of economic indicators in 2015 between Baotou and other western cities, we will analyze the main focuses of supply-side structural reform in industrial cities. Take Baotou’s industrial structure for example, Baotou, has five characteristic industries—steel, aluminum, equipment manufacturing, and electric power, which support the development of local industrial economy. In 2015, the percentage of primary industry in the whole economy is under 10 percent, but the secondary industry accounts for a relatively large proportion. And there are 14 similar industry structure cities in northwestern region. After measuring economic strength in different cities, we choose 10 cities as samples. Finally, they are Ordos in Inner Mongolia, Urumqi in Xinjiang, Xi’an, Baoji, Yan’an, Yulin in Shaanxi province, Lanzhou in Gansu, Yinchuan in Ningxia, Xining in Qinghai and Baotou.

3.2 Factor analysis

3.2.1 KMO test and Bartlett test

KMO test statistics is used to compare the correlation coefficient with partial correlation coefficient in independent variate. First, we should have KMO and Bartlett tests in indexes. If its value is more than 0.5, it is generally believed this factor is suitable for factor analysis. Analyzed the numbers in table 1, it shows that statistical value in KMO is 0.542, and the result Bartlett sphere test is significant (Sig. Value = 0 < 0.05), so indexes data in table 1 can meet the requirements of factor analysis.

3.2.2 Scores and ranking of factor analysis

After re-standardizing the data, the SPSS21.0 is used to analyze factors on it. And the accumulation of four factors which is extracted from the results reaches 93.68%. Then the rotating the factors, the scores of factors in major northwestern cities can be obtained. Therefore, the ranking of synthesis scores in different cities is listed in table 1.
Table 1. Factors, comprehensive scores and rankings in major northwestern industrial city.

<table>
<thead>
<tr>
<th>Districts</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>Comprehensive scores</th>
<th>Rankings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baotou</td>
<td>-0.1619</td>
<td>0.1693</td>
<td>0.1043</td>
<td>0.169</td>
<td>0.2807</td>
<td>2</td>
</tr>
<tr>
<td>Ordos</td>
<td>-0.0751</td>
<td>-0.1511</td>
<td>0.2993</td>
<td>0.0503</td>
<td>0.1234</td>
<td>3</td>
</tr>
<tr>
<td>Urumqi</td>
<td>-0.1884</td>
<td>0.3273</td>
<td>0.0254</td>
<td>-0.1245</td>
<td>0.0398</td>
<td>4</td>
</tr>
<tr>
<td>Xi’an</td>
<td>1.3601</td>
<td>-0.0099</td>
<td>-0.0068</td>
<td>-0.0272</td>
<td>1.3162</td>
<td>1</td>
</tr>
<tr>
<td>Baoji</td>
<td>-0.0425</td>
<td>-0.1396</td>
<td>-0.1391</td>
<td>0.1357</td>
<td>-0.1854</td>
<td>6</td>
</tr>
<tr>
<td>Yan’an</td>
<td>-0.1398</td>
<td>-0.2504</td>
<td>-0.1451</td>
<td>0.032</td>
<td>-0.5033</td>
<td>9</td>
</tr>
<tr>
<td>Yulin</td>
<td>-0.0156</td>
<td>-0.2677</td>
<td>0.1561</td>
<td>-0.0848</td>
<td>-0.212</td>
<td>7</td>
</tr>
<tr>
<td>Lanzhou</td>
<td>-0.0236</td>
<td>0.1149</td>
<td>-0.1732</td>
<td>0.0579</td>
<td>-0.0239</td>
<td>5</td>
</tr>
<tr>
<td>Yinchuan</td>
<td>-0.0482</td>
<td>-0.2073</td>
<td>-0.1128</td>
<td>-0.0171</td>
<td>-0.3854</td>
<td>8</td>
</tr>
<tr>
<td>Xining</td>
<td>-0.2478</td>
<td>-0.0683</td>
<td>-0.071</td>
<td>-0.2151</td>
<td>-0.6022</td>
<td>10</td>
</tr>
</tbody>
</table>

According to rotating Matrix composition, the index of common factor F1 has high load in dimension of total factor productivity, such as in the number of patent application and patent authorization, scientific research, technical service people and so on, and contribution rate of F1 reaches 46.98%. Therefore, F1 is the comprehensive factor of representative total factor productivity. Since contribution rate of F2 is 19.58%, factor F2 can be considered as comprehensive factor of representative capital inputs. For contribution rate of F3 is 15.39%, which has larger load in economic base index, the F3 can be regarded as a comprehensive factor of representative economic base; the contribution rate of F4 reaches 11.74%, which has larger load in dimension of labor inputs. So it can be thought as a comprehensive factor in labor inputs. Above all, through the analysis of factors, it can be concluded that the supply-side indexes in Baotou ranks in the second, which has a bigger gap with Xi’an which ranks in the first in synthesis scores. So, the first principal component (F1) ranks the third, the second principal component (F2) is in the second place, the third principal component (F3) is in the third, and the fourth principal component (F4) is in the first place.

4. Comparative Analysis in Supply-Side Indexes Between Baotou and Other Major Northwestern Industrial Cities

4.1 The input-output of science and technology is lower, and conversion rate in scientific and technological achievements is not high

From the perspective of the total factor productivity, appropriation expenditure in science and technology in Baotou occupies the third place, but the number of patent application and authorization is in the mediate place which is in the same place as scientific research and technical service staff. Compared with Xi’an that ranks in the first place and whose patent application number is up to 0.48 / per person (scientific research and technical service staff), the number of patent application in Baotou is 0.30 / per person (scientific research and technical service staff). Although science and technology input is 1.7 times more than Baotou, the number of patent application is 26 times more than Baotou. Therefore, the ratio of science and technology inputs and outputs are low. Through investigation and interviews, there are only 5 regular institutions of higher education (including vocational colleges) and mineral institute of science and technology in Baotou whose research and service construction in science and technology are laggard and whose teaching-researching cooperation is not tight. So the conversion ratio in Science and technology docking is not high.

4.2 Financial environment is poor, and financial services supply is inadequate

From the point of capital inputs, the proportions of investment in fixed assets and the second industry in Baotou is in the third place; regional financial spending and all kinds of loan balance are in middle levels. Compared various kinds of loan balance and regional GDP with other cities, the ratio in
Baotou is 0.580 which ranks at the bottom. The top three cities are respectively Xining, Lanzhou and Xi’an Baotou. To some extent, it is proved that financial environment in Baotou is poor, and its financial supply is low. At the end of 2015, north heavy industries group CO., LTD and any other industries company that located at Baotou loaned 21.139 billion from the outgoing banks [6], which suggested that local financial services cannot meet the financial needs of the local industries.

4.3 The industrial structure is in the late stage of industrialization, the growth of industrial economic is slower

From the perspective of city’s economic basis, the regional GDP and the number of industrial companies in Baotou rank the third; Per capita GDP, total volume of retail sales in social consumer goods and industrial added value are in the second place; local government receipts, the proportion of secondary industry and all kinds of loan balance are in the middle place. The industrial structure in tertiary industry is more than that in secondary industry, and the industrial structure in secondary industry is more than that in primary industry in Xi’an, Urumqi and Baotou. But in other cities, the industrial structure in secondary industry is more than that in tertiary industry, and industrial structure in tertiary industry is more than that in primary industry. The added value in secondary and tertiary industry is respectively 183.06 billion and 185.02 billion, and their proportion in the city’s gross domestic product are respectively 48.4% and 48.9%. So, the proportion of the tertiary industry surpasses 0.5% of the secondary industry for the first time. But compared with data in 2014, the truth is the growth of secondary industry was slowing, and fells by 1.6%. The industrial economy in Baotou is under pressure to downward. Some traditional advanced characteristic industries are overall in low state of development, and many industries suffer the problems of excess capacity, and short industry chain, etc.

4.4 Labor capital stock is too large and human capital quality is not good

From the perspective of labor inputs, the employment proportion in Baotou’s secondary industry is the highest and that in tertiary industry the lowest. The number of college students and education spending are in the medium level. Although the number of industrial companies ranks the third and Industrial production is in the second place, and scientific research and technology service staff is in the middle position, the employment rate is the highest which shows that labor capital stock in secondary industry is too large and human capital quality is not good. At the same time, growth rate in labor costs is far faster than that of productivity that bring a heavy burden to industrial enterprises [7].

5. The Focus in Supply-Side Structural Reform in Baotou

5.1 Establish efficient scientific research institution and service platform, promote conversion rate in urban innovation achievements

Government should improve the scientific and technological management system and perfect intellectual property rights system, and then improve the system of research and administration which regards enterprises as the main body and market as orientation in order to promote the transformation of scientific and technological achievements [8]. Building a platform for innovation and establishing college students’ business incubators and transformation center of technical achievement can be used to promote urban industry technology innovation strategic alliance to optimize innovation resources, encourage the public to set up business and come up with innovation so as to improve transformational levels in city innovation.

5.2 Prefect the local financial system and improve the financial environment

Strengthen the introduction intensity of jurisdiction outside banking institutions and expand the scope of the financial radiation. Through internet financial pattern, PPP and any other financial innovative manner, and other direct financing manners, such as VC, PE and so on, more market space can be left for some emerging industries and infrastructure construction projects which have high
development potential, high technology and high added-value. By gradually reducing the distribution of resources in zombie and high-polluted, overcapacity companies, there is more room emptied for the enterprises which own sustainable development ability in order to vitalize some parts of bad debts in banks to make money be used into efficient enterprises. Therefore, the target of promoting the transformation of industrial economic structure, replenishing the short board in economic structure, science and technology innovation and infrastructure construction can come true.

5.3 Optimize industrial structure, and promote strategic emerging and high-tech industries

Taking establishing new industrialization industry demonstration bases, upgrading development zone in national level and constructing characteristic industrial park as the key points, Baotou build a modern industrial system which is around high and new technology development zone, aluminum industry park, equipment manufacturing park and steel factories, to make the development of industrial enterprise safety, green, efficient. Promoting the fusion between new and high technology industries and industrial enterprises, changing the styles of renovation in high-tech industry, and developing new markets and products make the product added value in existing industrial enterprises improved, new products launched, equipment modernization realized so as to upgrade industries. Strengthen the interaction of industrialization and information and support the new production method in intelligent human-computer interaction system in order to promote the development of industry to the high-end [9].

5.4 Adjust the human capital stock, and improve the quality of human capital

Organize the professional learning and technical training for existing staff in Baotou industrial enterprises, and strengthen the incentive of scientific and management talent, then complete the allocation mechanism which can be used to show value in different intellectual labor. Have more permanent entrepreneurs and technologists guide in technology to help innovate technology promotion models. Give special and introduced talents different levels of benefits, and improve the level of introducing talents to provide more innovation and intellectual supports for regional economic development. And encourage the entrepreneurship and innovation in public, improve the system of innovative entrepreneurial mechanism, and optimize talent development environment.

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