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Analysis on the Industrial Structure Optimizing and the Population Decentralizing Strategy of Beijing

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Abstract: Population growth, air pollution and other problems have become increasingly serious in the process of rapid urbanization and urban expansion of Beijing. To strengthen capital core function and shape new development pattern, it is necessary for Beijing to optimize its industrial structure and decentralize the population in the central urban area. This paper discusses the optimizing of industrial structure and the decentralization of population of Beijing. The conclusions are that (1) optimizing the industrial structure of Beijing includes industrial relocation and industrial upgrading, and the adjustment of industrial structure contributes to the optimizing of employment structure; (2) the construction of satellite town is an important measure to decentralize the population and industries in the downtown of Beijing, and should stresses their accessibility, the ease of daily life of local residents and the coordinated development of local economy and environment.

1. Introduction

Beijing's GDP has been growing rapidly for a long time, but the growth is accompanied by overcrowded population and environmental degradation. As the capital of China, compared to the surrounding cities, Beijing possesses policy advantage that promotes the concentration of industries and employment. Currently, Beijing faces urban redevelopment and badly needs solution to the excessive growth of population, the air pollution, and the over concentrated industries. These problems are correlated. To solve them, Beijing needs to optimize the industrial structure to establish new pattern for economic growth, and decentralize the overcrowded population in the central urban area to ease the population pressure. Optimizing the industrial structure signifies that industries that don't conform to capital function should be removed and high value added and energy saving industries gets emphasized. To decentralize the population, it is requisite to construct satellite towns to form polycentric development pattern.

2. Basic Information for Population, Industries and Employment of Beijing

The population density of the central urban area, including capital core functional area and urban function extension area, is much higher than that of the new area of urban development. By the end of 2015, 59.1% of total permanent population of Beijing lived in the central urban area (Table 1). The industries and employment has almost the same distribution as the permanent population. 68.6% of legal entities and 71.8% of employment in Beijing concentrated in the central urban area (Table 2).

Table 1 Quantity, distribution and density of permanent population in Beijing (2015)

	Permanent Population (10000 persons)		Percentage (%)		Permanent Population Density (person/km^2)	
	2014	2015	2014	2015	2014	2015
Total	2151.6	2170.5	100	100	1311	1323
Capital Core Functional Area	221.3	220.3	10.3	10.1	23953	23845
Urban Function Extension Area	1055.0	1062.5	49.0	49.0	8268	8327
New Area of Urban Development	684.9	696.9	31.8	32.1	1088	1107
Ecological Conservation Area	190.4	190.8	8.9	8.8	218	218

Source: Beijing Statistical Yearbook 2015 [1].

Table 2 Number of legal entities and employment (2013)

	Legal Entities		Employment	
	Number	Percentage (%)	Employed Persons (10000 persons)	Percentage (%)
Total	630545	100	1111.3	100
Capital Core Functional Area	81797	13.0	202.6	18.2
Urban Function Extension Area	350737	55.6	595.6	53.6
New Area of Urban Development	147352	23.4	246.9	22.2
Ecological Conservation Area	50659	8.0	66.2	6.0

Source: Beijing Economic Census Yearbook 2013 [2].

According to Beijing Economic Census Yearbook (2013) [2], there are 31 sectors in Beijing's manufacturing that cover low-skilled manufacturing such as manufacture of foods, capital intensive manufacturing such as manufacture of fabricated metal products and manufacture of non-metallic mineral products, and technology intensive manufacturing such as manufacture of medicines and manufacture of motor vehicles. Comprehensiveness is the main characteristic of Beijing's manufacturing. In terms of employment, manufacturing employed 1.385 million people in the year 2013, which was increased by 39 thousand compared to the year 2008. Over the period 2008-2013, the quantity of employment of the tertiary industry grew 2.791 million and reached 8.947 million, 79.5% of which concentrated in the central urban area of Beijing [2]. In the tertiary industry, except the Transport, Storage and Post sector, the employment of all the other sectors grew, and the biggest growth, 534 thousand, came from the Wholesale and Retail Trade Sector which employed 1.478 million employees by the end of 2013.

Generally speaking, in Beijing, the employment has been in rapid growth, and the permanent population, industries and employment suffer maldistribution.

3. Foreign Experiences to Cope with Excessive Concentration of Industries and Population

Seoul and Tokyo metropolitan areas both have experienced urbanization, urban sprawl and high speed population growth in the early stage of their formation.

In 1960s, the scale of Seoul began to expand rapidly as the economy grew in high speed. Since 1970s Korean government has issued four Comprehensive National Territorial Plan, three Planning for Metropolitan Region of Seoul [3] and numerous policies involving decentralization of public institutions in capital area, promoting construction of satellite cities, population control, industries restriction and so forth to solve the problem of population concentration in capital area.

Tokyo had set five National Capital Region Plan between 1958 and 1999, content of which involved (1) strictly restricting new factories built in Tokyo as well as moving the industries from old industrial area in Tokyo to neighbor cities to accelerate their development, (2) decentralizing the functions of capital area to surrounding cities to form new core functional cities, (3) promoting multi-polarization development around capital area by reconfiguration of city functions [4].

Beijing is trapped in over concentration of industries and over size of population at present, and the comprehensive type of industry has been the negative factor that restricts the development of Beijing. From the experience of Seoul and Tokyo, Beijing's urban development requires promoting the low-carbon industries by industrial relocation and industrial upgrading, strengthening the

development of knowledge intensive industries, and decentralizing the population in the central urban area to satellite towns to reduce population pressure.

4. Optimizing the Industrial Structure of Beijing

The core urban function of Beijing is the China's center of politics, culture, international communication and innovation. To support these four functions, the economic development of Beijing is of the essence. Besides, as an international city, Beijing's urban development also needs solid economic foundation. Accordingly, although Beijing is not the economic center of China, developing the economy is the priority of Beijing. The composition of Beijing's GDP has been in a relatively stable state. It is necessary to optimize the inner structure of the secondary and tertiary industry by industrial relocation and upgrading to maintain the economic growth.

The industrial structure optimization contributes to the decentralization of population of Beijing. On the one hand, the industrial relocation promotes the employment transfer. On the other, the industrial upgrading facilitates the transition to knowledge-based industries that have a relatively weak labor demand. It is needed to note that the decentralization of population doesn't equal to drive permanent migrant population away from Beijing. It is promoted by adjusting the industry types and the employment structure based on the capital core function. In this process, there will be employment both gets away and in.

In the context of Jing-Jin-Ji collaborative development, the industrial relocation of Beijing plays an important role in Beijing's urban development and in driving economic growth of surrounding areas. Broadly speaking, the relocated industries are those which don't conform to the capital core function. They mainly consist of high energy consumption and labor intensive industries.

In addition to industrial relocation, optimizing the industrial structure also require industrial upgrading to form the industries that emphasize creative, knowledge and culture and satisfy the needs of green economy. Industrial upgrading underlines the quality of economy. That means making greater per capita output with less resource consuming and less negative effect to environment. The key of industrial upgrading is knowledge-based industries, development of which underlies new product, service and innovations [5]. The characteristic of knowledge intensive industry, differing from traditional industry, is that it takes knowledge capital as the core and possesses higher labor productivity. Beijing, which has been in the post industrial age, should take developing knowledge intensive industry as the foundation for industrial upgrading and as the most significant impetus to urge the urban redevelopment. Benefiting from the large number of universities, scientific research institutions and large enterprises, knowledge-based industries in Beijing has great development potential. Taking full use of this advantage, Beijing could not only promote its transition to knowledge economy, but export technology to facilitate the collaborative development of Jing-Jin-Ji.

5. Developments of Satellite Towns and Polycentric Development Pattern

Beijing has been in monocentric development pattern for a long time. Although the construction of satellite towns has been projected in Beijing's previous urban comprehensive planning, very little has been achieved in the implementation. To relieve the pressure from overcentralization of population, industries and employment in the central urban area, it is necessary for Beijing to strengthen the development of satellite towns to form the polycentric development pattern. Polycentric pattern needs the transfer of industries and medical and education resource from downtown to satellite towns, and also requires the transition of industry types to knowledge intensive industries which could provide flexible employment. Therefore, the polycentric development pattern of Beijing claims the adjustment to the structure and distribution of regional industries.

To serve the purpose of decentralizing the population in the central urban area, the satellite towns should fulfill the local requirements for education, employment, residence, entertainment and medical treatment. Thus the scale of satellite towns should achieve a certain size. Moreover, the

distance between the satellite towns and the downtown had better be far enough; otherwise the resident of satellite towns would be inclined to use the facilities with higher quality in the downtown, which would confine the function of satellite towns to only dwelling. By means of promoting the infrastructure construction in the satellite towns, the superiority of living condition in downtown is gradually attenuated, and the high living and operating cost in the downtown would drive people and enterprises to move out.

Polycentric development pattern is sustained by efficient traffic network, and the accessibility of satellite towns directly influences their economic development and attraction to migrant population. Beijing has been paying great attention on metro construction, but still lacks light rail connect downtown and satellite towns. People in Beijing rely on public transit heavily, and the lack of light rail and other similar public transit bring about a certain extent of isolation of satellite towns to the central urban area in practice. This isolation results in that residents and business in the central urban area disincline to move out, which adversely affect the population decentralization. In view of high efficiency and punctuality, building light rail serves the polycentric development pattern for Beijing.

6. Discussion and Conclusions

The good economic development condition and abundant educational and cultural resource of Beijing builds objective foundation for the transition to knowledge economy. Besides, the pressure from oversized population and air pollution drive the demand of Beijing for sustainable development. Optimizing the industries and decentralizing population are interrelated with each other. On the one side, the former promotes the employment restructuring that is conducive to the latter, and, on the other, the latter eases the population pressure in the central urban area of Beijing and make room for the emerging industries. In addition, in the process of industrial relocation, relocated enterprises must upgrade technology, substitute clean energy for coal, reduce energy consumption and pollutant emission, and adjust product structure by producing high technical and high value added products.

For Beijing, polycentric development pattern demands the convenient transportation among downtown and satellite towns. Since the automobile are the main source of air pollutants in Beijing, the construction of transportation infrastructure should emphasize the public transportation, especially the rail transit system. Furthermore, the private cars enter the downtown should be charged and the emission standards of vehicle should be more strict to encourage taking public transport.

Satellite towns have different natural endowments and development paths. Hence they ought to formulate differentiated plan to develop appropriate industry and to avoid cutthroat competition. In addition, since livable environment is the basic condition to attract migrant people and enterprises, sustainable development should always be the priority of these satellite towns.

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