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Resource Allocation and Industrial Inequalities in Beijing-Tianjin-Hebei City Cluster

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Abstract. City agglomerations and city clusters are topics being widely discussed and analyzed nowadays. People are curious about the actual reasons why the overall performances of city clusters differ from each other and why these differences are formed and even widened, seeking detailed insights into this topic. With most of them stating that the future of Beijing-Tianjin-Hebei City Cluster is bound to be disappointing. In this study, it is believed that the future will be better while admitting the status quo is not optimistic. Economic data including GDP, GDP growth rate and income situations is derived from governmental data from statistical bureau. The article will focus on how the economic performance of Beijing-Tianjin-Hebei Region can be enhanced by using the economic models of the Yangtze River Delta Urban Agglomeration as references. Comprehensive solutions for Beijing-Tianjin-Hebei Region (BTH Region) will be made according to comparisons between city clusters that explained he reason why BTH Region explained sluggish economic and social development, even including aspects like education, medical treatment and social welfare.

Keywords: Beijing-Tianjin-Hebei Region (BTH), Inequalities, Regional differences, Citizens' satisfaction, Future development.

1. Introduction

Nowadays, urban agglomerations, applied in the form of city clusters, develop in countries worldwide. Since the 21st century, cities in the mainland of China began their rapid expansion, which was evident in the constructions of urban infrastructures, the boom of urban population and substantial growth in economic output. City clusters are the inevitable product of urbanization development to a certain stage, and play an important role in leading the regional and even national economy, the core of which is the industrial agglomeration effect. In China's inland area, several city clusters were established in the past 50 years; Yangtze River Delta City Cluster (1982), Pearl River Delta City Cluster (1994) and Beijing-Tianjin-Hebei City Cluster (2013) are the three biggest ones among them [1]. Despite the policy supports that appear in all of the three city clusters, their developing level differs from each other; Specifically, the Yangtze River Delta and the Pearl River Delta have a superior economic output than the Beijing-Tianjin-Hebei City Cluster, with their Gross Domestic Product (GDP) being nearly three times that of the Beijing-Tianjin-Hebei City Cluster. This phenomenon began happening from the time that the concept of Beijing-Tianjin-Hebei city cluster was raised, and became more and more obvious in the past decade. Apart from what the total economic output has shown, the inequality within the city cluster and the interconnection are also totally different. This study will discuss the reason why city clusters undergo different situations and provide suggestions to help the city cluster change its status quo in the following passage, centering on the questions of "What are the successful and failed cases of resource allocation in the existing city clusters?" and "How to realize sustainable development by adjusting industrial layout and rationally tilting resources? (focusing on the proportion of primary, secondary and tertiary industries and the trend of change)". While the reasons are important for investigating the current situation of Beijing-Tianjin-Hebei city-cluster, it is still crucial to know about how to improve the current situation so that economic and educational inequalities will be eliminated, or at least dimmed down. Thus, the combination between problem and solution should be raised at this point [2].

2. Literature Review

2.1 The Development Achievements and Regional Status Enhancement IN Beijing-Tianjin-Hebei City Cluster

Most of the data analyses focus on the developing accomplishments of the Beijing-Tianjin-Hebei city cluster but somewhat overlook the problems emerging through the data. Take a report (2024) of the coordinated development of this city cluster for instance, the report suggests that "since the implementation of the Beijing-Tianjin-Hebei coordinated development strategy, the three places have achieved considerable development, and the Beijing-Tianjin-Hebei region has become one of the most dynamic regions. In 2023, the total economic output of the three places will reach 10.44 trillion yuan, an increase of 4.57 trillion yuan compared with 5.87 trillion yuan in 2014, and the proportion of the national GDP will reach 8.3%, so that the overall strength of the region will step forward, and the role of "ballast" for the development of the country will be irreplaceable. The overall strength of the region has reached a new level, and the role of 'ballast' for national development is irreplaceable." Nevertheless, the disparity should be underscored despite the fact that the improvements were dramatic. When surveying and contrasting the difference in economic growth between the Yangtze River Delta and the Beijing-Tianjin-Hebei City Cluster, it is easy to read and understand that the development of the Yangtze River Delta is superior to that of Beijing-Tianjin-Hebei City Cluster [3].

2.2 Analysis of the Development Gap with the Yangtze River Delta Urban Agglomeration

Figure 1: GDP and GDP Growth Rate of China and Yangtze River Delta City Cluster

According to figure 1, it is shown that the cities in the Yangtze River Delta have a more rapid growth speed and a larger economy of scale compared to cities in the Beijing-Tianjin-Hebei City Cluster. This is evident in the figure above, where all cities have rapid development despite the current situations and economic scales they are in. However, situation in Beijing-Tianjin-Hebei City Cluster was imbalanced compared with that of the Yangtze River Delta. More than 10 cities in this region have an economic scale (GDP) of less than 500 billion CNY, and there are only Beijing, Tianjin and Tangshan which have an economic scale of more than 1 trillion [7]. (Among them is Tangshan which is one of the 2024 newly appointed 1-trillion-cities)

With regard to the methods that the analysis used so as to push my research forward, the central concept of urban agglomeration theory and analyses of official data are the key points. The data are mainly gathered from China National Bureau of Statistics and the official statistics departments from provinces or cities. For one, the data from these official websites are absolutely accurate, which ensures the supposed outcome of my research will be valid and convincing. Second, these data also allow me to investigate the relationship between

economic development and resource allocation policies because they are consistently accompanied by claims of policies in official articles. As for the application of "city agglomeration theory", it is the most important part of this research because only by keeping the alignment between this theory and the research topic-industrial resource allocation can the author gain a result of validity. After analyzing the given data and combining my research with the theory of urban agglomeration, the author plans to create a data model (database) of urban cluster, use a computer to simulate the development of urban cluster, and study the influence of industrial resource distribution on the development of city clusters, and then propose a more ideal urban cluster resource distribution model. A computer simulation model is chosen for future research because there are no existing city clusters worldwide that can serve as suitable models, indicating that a perfect and ideal situation cannot be observed in reality. Although this task will be time-consuming, it will still be a meaningful activity.

3. The Impact and Reasons of Industrial Structure Adjustment on Regional Economy

Given the current data that could be found at official websites, certain analyses could be made. In accordance with the concepts of "why cities thrive", it is obvious that people in the Yangtze River Delta, with a much denser population, will likely be much more productive and will earn more than those in the Beijing-Tianjin-Hebei City Cluster. Additionally, the present circumstance is that Beijing-Tianjin-Hebei City Cluster has only a few "985 institute" (which are mostly in Beijing), taking up merely 10% of all the "985 institutes" throughout the country. The thing that makes the situation even worse is that these resources are tilted; Specifically, none of those colleges are located in Hebei province, and only a small proportion of them are in Tianjin. Thus, it could be explained why the Beijing-Tianjin-Hebei City Cluster lacks vitality using the city agglomeration theory that highly-educated people move to bigger cities in a city cluster and crowed-out the income premium of lower educated peers [6]. This is what makes my research goal to be finding ways to eliminate the severe inequality of resources in Beijing-Tianjin-Hebei City Cluster. Indeed, some sources from scholars that analyzed the problem of education inequalities state the bright future of tackling the issue, but also stated some concerns. For example, the inequalities in highly educated population distribution led to a continuously increasing gap in economic development between Beijing, Tianjin and Hebei Province. Although some rigid policies may help eliminate certain gaps or inequalities, they are still inadequate to tackle the problem. Even under circumstances such as "welfare being given if you locate the factory in Hebei Province", there are still no firms which will choose to locate in comparatively under-developed regions such as Hebei Province. The huge drawback in profits will lead to their avoidance towards lagged economic places. The problem now turns to how to retain talented people while making sure that they will not get a sense of loss of benefits such as better work opportunities or higher salaries.

According to official data from statistical institutions, the average salary of newly graduated college students in Beijing is about 140 thousand CNY, with those in Tianjin and Hebei earning 115 thousand and 40 thousand, respectively. What is presented is the data for 2024, where the gap between Hebei Province and Beijing has widened a lot, with the salary in Beijing being more than two times that of Hebei Province. According to the data over the past decade, the income gap among graduating college students has been widening in recent years [8]. For instance, in 2015, the per capita income in Beijing was only 1.5 times that of Hebei Province. This can be explained when being placed in the situation of the severe de-industrialization caused by the air pollution control efforts in the Beijing-Tianjin-Hebei region during 2013-2019. According to the policy that was published in 2013 by Ministry of Environmental Protection and National Development and Reform Commission of China, the air pollution situation in Beijing-Tianjin-Hebei City Cluster, this region has experienced a huge reduction of heavy industry and conventional industries because of the requirement of environmental protection. As provinces which rely on high-energy-consuming traditional heavy industries as its pillar industries, Hebei and Tianjin suffered from one of the most severe declines of industrial output. Throughout the process of enhancing air quality, the nominal GDP began sluggishly and the nominal GDP growth rate of the two regions fell to the bottom of the nation [5].

4. Coordinated Development and Optimization Strategies

Both targeted investments and structural reforms must be given top priority in a coordinated strategy to alleviate economic disparities and revitalize Tianjin and Hebei within the Beijing-Tianjin-Hebei urban cluster.

In order to lessen reliance on the capital, the central government should encourage the relocation of top-notch medical and educational facilities from Beijing to nearby areas. This is one important way to achieve balanced resource allocation. At the same time, tax breaks and subsidies for digital and green manufacturing sectors should speed up industrial upgrading, allowing Hebei to shift from heavily polluting industries to sustainable growth models. Expanded high-speed rail networks and intelligent logistics hubs are examples of improved intercity infrastructure that would improve the integration of regional labor and capital flows and lessen the "siphon effect" of capital. Furthermore, fiscal redistribution measures like special development grants and shared tax revenues may also give local governments the authority to enhance urban amenities and public services. Tianjin and Hebei can eventually move from stagnation to a more competitive and inclusive development path by encouraging innovation, fair resource distribution, and increased regional connectivity.

5. Conclusion

This paper has followed the economic disparities in the Beijing-Tianjin-Hebei (BTH) City Cluster with a comparison to better-performing Yangtze River Delta (YRD) and Pearl River Delta (PRD) clusters. Even though seemingly successful in GDP growth as well as coordination at the regional level in the BTH region, there remain substantial problems in the form of skewed resource allocation, income inequality, and industrial decline according to environmental policies. The report indicates that the concentration of top-class education and medical facilities in Beijing aggravates regional disparities, while Hebei Province lags behind economically and in the accumulation of talents.

Addressing these issues requires concerted effort such as relocating top-ranked institutions to the neighboring regions, promoting green and digital industries, and renovating intercity infrastructure. Redistribution of funds and targeted subsidies can also assist local governments in improving public services and attracting investment. This study does acknowledge some constraints, such as the use of macro-level statistics without specific local data and the need for real-world application of recommended alternatives. Subsequent studies would have to rely on micro-level case studies and computer modelling to develop optimum resource distribution models, encouraging sustainable and inclusive development in the BTH area. Through these measures, the BTH City Cluster can narrow its development gap behind the YRD and PRD, realizing at last balanced and high-quality regional development.

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