

Industrial Transformation in Hebei Province of China

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Abstract. Industrial transformation and upgrading are the main themes of the economy nowadays. However, in the present development, industrial transformation in many districts has encountered bottlenecks. This paper pointed out the problems of industrial transformation in the Hebei province of China and analyzed in depth the causes of the bottleneck of industrial transformation in Hebei. The main reasons were insufficient marketization, brain drain, and insufficient innovation. Based on each of these causes, Hebei should increase marketization, deal with the relationship between the government and the market, increase the Private-Public-Partnership business model, improve the social security mechanism for talents, invest in the education industry, increase the investment in research and innovation, establish a complete innovation ecosystem, and build an economic environment conducive to breaking the bottleneck of industrial transformation.

Keywords: Industrial transformation, marketization, innovation.

1. Introduction

Hebei is a provincial-level administrative region in northern China, surrounding Beijing and Tianjin. With the development of China's low-carbon economy and changes in consumption patterns, Hebei, which is dominated by the secondary industry, is facing great challenges. To develop together with the neighboring cities, it is important to upgrade and transform Hebei's industries. In 2015, the Political Bureau of the Central Committee of China issued the "Outline of Coordinated Development of the Beijing-Tianjin-Hebei Region", which provides a plan for the coordinated development of the three regions of Beijing, Tianjin, and Hebei, as well as their respective functions. Among them, Hebei is positioned as a "National pilot area for industrial transformation and upgrading". The reform of traditional heavy industries and the development of high-tech industries have become the center of development and the theme of Hebei Province.

There is a lot of literature and research related to industrial transformation in Hebei. Firstly, some articles take the development of "Beijing-Tianjin-Hebei integration" as the starting point and research center. For example, Xiaoli Lu evaluates the overall path and effect of industrial transformation and upgrading in the three provinces [1], and Xiaodi Jiang explores the applicability of multi-actor participation in innovation as a path for the transformation and upgrading of Beijing-Tianjin-Hebei clusters based on the perspective of spatial and evolutionary economics [2]. Secondly, there is literature from the perspective of environmental protection and low carbon economy. For example, Bohan Zhou describes the impact of green financial development on industrial transformation in Hebei [3], and Lu Cao explores the path of industrial green transformation in Hebei Province [4]. Finally, some analyses focus on the reform and upgrading of a single industry. For example, Dandan Gu and Youqing Xu explore the transformation and upgrading of the iron and steel industry in Hebei Province [5], and Suying Jin analyzes the transformation of the coal industry [6]. In summary, existing studies lack targeted analysis of industrial transformation and structural adjustment in Hebei Province. The shortcomings and problems in industrial transformation in Hebei Province, as well as the related solutions, are still missing. Based on the above background, this paper will put forward the reason analysis for the weak points of Hebei's industrial transformation, and then give feasible adjustment opinions to help the completion of Hebei's industrial transformation.

2. Case Background

Hebei's industrial structure has obvious problems. Heavy industries such as steel production had been the core industries of Hebei for a long time. The technology related to equipment manufacturing and high-tech industries was behindhand [7]. At the same time, Hebei lacked local high-end leading enterprises, the financial industry, as well as high-tech industry. This led to serious industrial homogenization in Hebei. In addition, due to its dependence on heavy industry, Hebei was the most serious area in the country in terms of high energy consumption and pollution [7]. To mitigate this problem, industrial transformation in Hebei Province has been underway for the past decade.

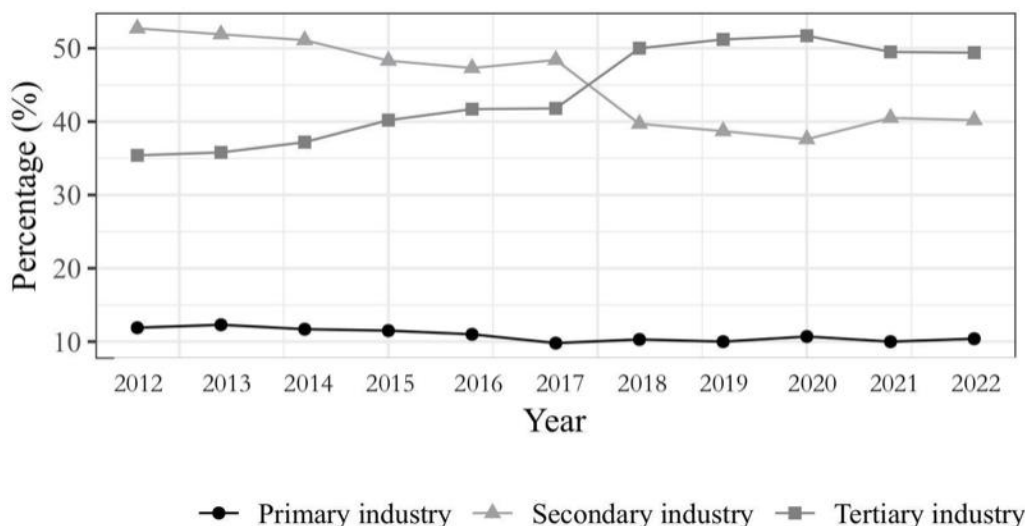


Figure 1. Percentages of three types of industries in Hebei Province

Under the goal of industrial transformation, the industrial structure of Hebei Province has been changed. As can be seen from Figure 1, in the vertical time dimension, the primary industry in Hebei maintained a proportion of about 10% during the decade. The proportion of the secondary industry showed a decreasing trend, on the contrary, the proportion of the tertiary industry increased year by year. Between the years 2017 and 2018, the tertiary industry in Hebei Province exceeded the secondary industry for the first time, accounting for about 50% of the province's GDP, marking the initial success of the transformation of the industry, from a secondary industry-led to a tertiary industry-led industrial pattern. However, after 2020, the proportion of tertiary industry began to fall and secondary industry rebounded, indicating that industrial transformation began to encounter difficulties. In the dimension of horizontal comparison among Chinese provinces, in 2022, Hebei's tertiary industry share was in the bottom 10th position among the 31 provinces in mainland China. Therefore, Hebei's industrial structure is still behind the national level. In short, Hebei's industrial transformation has encountered a bottleneck in recent years, and the proportion of the tertiary industry is no longer rising; at the same time, its industrial structure is below the national level, and it fails to form a developed economic pattern dominated by the tertiary industry.

3. Causes of Industrial Structure Problems in Hebei Province

3.1. Insufficient Marketization

The degree of marketization in Hebei has not been reformed in line with the progress of industrial transformation and remains insufficient. Marketization became a drag instead of a support for industrial transformation. There are three main reasons for this phenomenon. The first is the "Sipion effect" from the neighboring big cities. Hebei is geographically close to Beijing and Tianjin, two of China's most developed cities. As a result, production factors in Hebei tend to flow to the more resource-rich provinces [8]. Consequently, Hebei's industries tend to be homogenized and uncompetitive. The second reason is market regulation. Hebei is neighboring Beijing and has joined

forces with Beijing and Tianjin for synergistic development. This has led to a greater degree of market regulation and intervention [8]. According to the statistics, the state-owned economy in the Beijing-Tianjin-Hebei region totals more than 60% of China [8]. The government's intervention in the free market has resulted in allocative inefficiency and a waste of resources. The third reason is that Hebei Province has been tasked with "taking over Beijing's non-capital functions", but there was a clear mismatch between these and the industries that Hebei wished to take over [9]. High-emission industries that were originally located in Beijing have been relocated to Hebei, but these are the industries that Hebei wants to reduce. At the same time, the high-end industries and services that Beijing is moving to Hebei, such as healthcare and education, are not being taken over efficiently because they face many institutional barriers. The lack of marketization in Hebei due to the above three reasons led to a waste of resources and a serious homogenization of industries, which made the development of high-end industries difficult, limiting the effective transformation of the industrial structure in Hebei.

3.2. Outflow of Talents

The number of high-level talents in Hebei is insufficient to support its plan to transform into a high-end industry. Industrial restructuring is manifested in the gradual replacement of simple laborers by high-level technicians to bring more human capital value into play [11]. The upgrading of Hebei's industries to the high-end implies a high demand for high-skilled labor, but the overall number of high-end talents in Hebei province is insufficient. By the end of 2021, there were 2,564 experts with special government allowances under the State Council in Hebei, accounting for only 1.37% of the national total. The first reason for the lack of talent is the "siphon effect" from neighboring cities [8]. Beijing and Tianjin, with their rich resources and talent protection policies, have attracted many workers from Hebei. In 2022, the number of people from Hebei accounted for 25.7% of the total foreign population in Beijing. The average salary of a worker in Beijing is RMB 190,000 per year, in Tianjin, it is 120,000, while in Hebei it is only 80,000. Due to the high salaries in neighboring cities and the high attraction of their development platforms that Hebei itself does not have, talents are attracted by Beijing and Tianjin, forming many high-end talents flowing to those two places, resulting in Hebei itself into a lack of talents in the predicament. The second reason is the lack of higher education in Hebei. Hebei has only one university and one discipline selected by China's university ranking of "world-class universities and first-class disciplines". The education level of Hebei ranked at the end of the country with Tibet and other remote areas. The lack of educational platforms makes it difficult for Hebei to cultivate local top talents. Knowledgeable and capable college students often study at universities and work outside the province, exacerbating the loss of talent in Hebei. The employment structure of Hebei Province has not transformed along with the industrial structure, and there is a shortage of highly skilled personnel needed for high-end industries, leading to a decline in the efficiency of industrial transformation and bottlenecks.

3.3. Insufficient Development in Technology and Innovation

The level of research and development (R&D) and technological innovation in Hebei is insufficient to drive industrial transformation. The realization of industrial transformation relies on innovation, science, and technology, which can improve physical capital and human capital in the province and develop higher-end industries and more efficient production. However, the level of innovation in Hebei is very low. The first reason is Hebei's investment in scientific research is insufficient. In 2019, the intensity of R&D funding in Beijing, Tianjin, and the whole country reached 6.3%, 3.3%, and 2.2%, respectively, while the intensity of Hebei's funding was only 1.6%, which was lower than that of the rest of the country, leading to the lack of outstanding scientific and technological achievements [9]. The second reason is that the industrial chain for Hebei to undertake innovation from other provinces is also very weak. Due to the irrational structure of traditional industries, innovations from other provinces lack supporting conditions for implementation in Hebei. Innovation platforms are not attractive enough to enterprises and talents compared to other cities.

This has led to less cooperation in the transformation of high-quality innovation resources from Beijing and Tianjin to Hebei and often flows to the Yangtze River Delta region with a similar industrial structure [9]. Hebei then failed to utilize its geographic advantages to undertake more innovation resources. Without high-end innovation and technological support, Hebei can only rely on increasing the production capacity of other industries to promote industrial transformation.

4. Solutions

4.1. Promote Marketization

The first way to solve the difficulties of industrial transformation in Hebei is to increase the degree of marketization so that enterprises can develop and compete more freely and reduce the waste of resources.

First, Hebei's industrial transformation needs to use the advantages of Hebei's key development areas and have greater autonomy to drive the development. For example, Xiong'an New Area in Hebei is closer to Beijing, with highways built and near Daxing Airport, which endows transportation and geographic advantages. Xiong'an can therefore capitalize on its advantages to attract the inflow of enterprises and resources from other provinces and become a key area for Hebei's high-quality development. Similar areas in Hebei include Tangshan and the coastal area of Cangzhou. Such areas have key policy support as well as geographic advantages, and their high-quality industrial development needs to deal with the relationship between the government and the market and make full use of market-based incentives [10]. For the administration of new districts, it is necessary to establish a streamlined and efficient management system, reduce bureaucracy, facilitate business operations, and make the environment clear to entrepreneurs. This will optimize the business environment in Hebei.

Second, Hebei could also add the Private-Public-Partnership (PPP) business model, which is designed to open infrastructure and public service projects to social capital. The PPP model has two advantages. First, it fits Hebei's current situation. Because Hebei has a special political status and mission, a fully liberalized market is too idealistic. The PPP model allows state-owned and private firms to work together and ensures that the targeted projects are regulated. Second, it gives private companies more opportunities to grow and make profits, and it also avoids the usual inefficiency and bureaucratization of the public sector, allowing development projects to be implemented more efficiently. As a result, Hebei's market dynamism can also be further improved.

4.2. Enhance Talent Protection

Hebei's industrial transformation can also be made more efficient through talent protection. First, Hebei needs to optimize its work policy. On the one hand, it can encourage the migration of talents to Hebei by improving the labor market and social security system. In addition, the government can also establish an integrated platform for high-tech talents to seek employment and reduce information asymmetries between enterprises and employees [11]. On the other hand, high-tech industries can establish management mechanisms that are more attractive to talents. According to Taylor's scientific management theory, incentivizing employees with wages can be the best way to increase the overall efficiency of a company. High-tech industries in Hebei can increase salary incentives related to performance and achievements and prepare attractive reward mechanisms for employees with outstanding abilities to attract and retain high-skilled talents [11].

Second, Hebei should develop local higher education institutions to train and retain talented people. On the one hand, investment in higher education institutions can be strengthened to establish competitive and job-recognized professions. On the other hand, it can develop the training of specific technical talents. For example, the Hebei provincial government can target the training of technical talents according to the specific industries it wants to develop [11], to meet the change in labor demand brought about by industrial upgrading, fill the shortages of high-skilled labor, and prepare enough talents for the transformation of industries.

4.3. Insufficient Development in Technology and Innovation

Hebei Province needs to improve R&D investment and conduct several measures to address the low level of innovation.

First, Hebei needs to increase its R&D investment, concerning the national average of 2.2%. Taking "integrated development" and "innovation for industrial transformation and environmental protection" as the starting point, Hebei can strive to obtain financial support from Beijing, Tianjin, and national science and technology departments [10], and increase investment in innovation and entrepreneurship.

Secondly, Hebei can take Xiong'an New Area as a breakthrough, and transform the scientific and technological achievements from Beijing and Tianjin to Hebei. According to the "Planning Outline of Xiong'an New Area of Hebei", Xiong'an mainly takes over high-end industries from Beijing and Tianjin. Therefore, Hebei can optimize the infrastructure of the Xiong'an New Area and reduce the obstacles to industrial circulation [10]. For example, Xiong'an New Area can gain a competitive advantage in terms of household registration, healthcare, and other important social benefits to absorb more innovative resources and talents. Developing facilities and services in the zone will make Hebei the primary recipient of the innovation resources.

Finally, Hebei can promote financial services related to innovation. Drawing on the successful experience of the Shenzhen Special Economic Zone, promoting financial services such as start-up capital. It can support new enterprises by providing convenient financing services, and enable financial capital to support and lead Hebei's innovative development.

5. Conclusion

To sum up, the industrial transformation of Hebei Province has been effective in making the tertiary industry a leading place. However, Hebei's industrial transformation has also entered a bottleneck, which is mainly due to three reasons: lack of marketization, lack of human resources, and lack of R&D. According to the above reasons, this paper deeply analyzes the path of the reasons and the hidden problems and puts forward specific solutions for each problem in various perspectives. These targeted suggestions can make Hebei's industrial transformation more likely to get out of the bottleneck, find a new direction, and achieve a new round of industrial pattern optimization. Future research can continue to explore on top of the new approach proposed in this paper and summarize the solutions that are more suitable for the special situation of Hebei by combining Hebei's development experience and practical achievements, and continuously optimizing them to provide help for Hebei's industrial transformation.

References

- [1] LU Xiaoli. Effect Evaluation and Path Research of Industrial Transformation and Upgrading in Beijing-Tianjin-Hebei. Capital University of Economics and Business, 2023.
- [2] JIANG Xiaodi. Research on Industry Cluster's Transformation and Upgrading in BTH Region: Based on Spatial and Evolutionary Scope. Tianjin University, 2022.
- [3] ZHOU Bohan. Study on the Influence of Green Finance Development on Industrial Transformation and Upgrading in Hebei Province. Inner Mongolia University of Finance and Economics, 2023.
- [4] CAO Lu. Research on the Path of Industrial Green Transformation in Hebei Province. Hebei University of Technology, 2020.
- [5] GU Dandan, XU Youqing. Research on financial support for steel industry transformation and upgrading -- A case study of Hebei Province. Huabei Finance, 2020, (03): 56 - 62.
- [6] JIN Suying. Research on Coal Industry Development and Transition in Hebei Province. Hebei GEO University, 2017.
- [7] CHEN Jian. The overall positioning of Beijing-Tianjin-Hebei and the adjustment of industrial structure in Hebei. Journal of Hebei Institute of Socialism, 2017, (02): 12 - 16.

- [8] YANG Lihong, SONG Xiaohua, ZUO Xiaoli. Research on industrial transformation and upgrading in the context of Beijing-Tianjin-Hebei coordinated development. *Commercial Economic Research*, 2020, (11): 186 - 189.
- [9] LIU Tianen, WANG Lidong. Important progress and predicament of industrial transfer in Beijing-Tianjin-Hebei region. *Regional Economic Review*, 2022, (01): 117 - 123.
- [10] LIU Tianen, WU Yiqing. The connotation requirements, key difficulties and strategic measures of the high-quality industrial development of Xiongan New Area. *West Forum*, 2019, 29 (04): 116 - 124.
- [11] JIANG Pengxiao, XING Mingqiang. Research on the economic contribution of high-skilled talents in the process of industrial transformation in Hebei Province. *Economic Forum*, 2019, (07): 72 - 80.