

Research on the Innovation and Development of Regional Industrial Chain in the Context of Guangzhou-Foshan City

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Abstract: Based on the research on regional industrial chain innovation and development in the context of Guangzhou-Foshan City, this paper examines the industrial complementarity between Guangzhou and Foshan and finds that while Guangzhou-Foshan City is developing, there are still some issues, such as the homogenization and competition of industrial development, a lack of profound integration of industrial chain with innovation chain, and the need to optimize the innovative coordination system. Finally, it proposes some countermeasures to promote the innovation and development of Guangzhou-Foshan regional industrial chain from several aspects, including implementing regional advanced industrial base and modern industrial chain, promoting the deep integration of industrial chain with innovation chain, and optimizing the spatial layout of collaborative innovation.

Keywords: Guangfo City; Regional industrial chain; Innovation chain

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1. Introduction

Under the new “dual circulation” development pattern, China has pointed out that innovation chain should be positioned around the industrial chain and vice versa, so as to promote high-quality economic development. In order to construct a new development pattern, the key lies in the realization of economic circulation and smooth industrial connection, and its fundamental prerequisite is enhancing the innovation and connectivity of the supply system^[1]. “Dual circulation” is in fact the establishment of a safe and stable domestic supply chain system. Industrial chain is a very important component and the core of dual circulation. The formation of the new development pattern cannot be separated from the support of the industrial chain. Under the new development pattern, it is of great strategic significance to enhance the innovation-leading role of Guangzhou-Foshan City in regional development for China to achieve a better circulation, perform admirably in the dual circulation, and participate in international cooperation or competition at a higher level.

2.1. Analysis of industrial complementarity between Guangzhou and Foshan

2.1. The industries in Guangzhou and Foshan complement each other and promote coordinated development

In 2021, Guangzhou’s GDP was 2,823.197 billion yuan, while Foshan’s GDP was 1,215.654 billion yuan;

the sum of the two cities' GDP was 4,038.851 billion yuan, which was comparable to Shanghai and Beijing [2]. From the perspective of industrial composition, the two cities are highly complementary. Guangzhou's three-industry structure is 1.09:27.35:71.56, while that of Foshan is 1.73:55.99:42.27. Guangzhou's industrial structure is the "three, two, one" model, while that of Foshan is the "two, three, one" model. The total value of the secondary industry in Foshan is higher than that of the tertiary industry, and its development momentum is strong [3]. The reason is that Foshan's equipment manufacturing, household appliances, ceramic building materials, metal products, and other industries have outstanding economic strength.

2.2. Foshan's industrial enterprises are more competitive

As shown in **Figure 1**, from 2016 to 2020, the number of industrial enterprises above the designated size in Guangzhou increased from 4,662 to 6,208, with an average annual growth rate of 7.42%, whereas the number of industrial enterprises above the designated size in Foshan increased from 5,671 to 8,020, with an average annual growth rate of 9.05% [4].

The number of industrial enterprises above the designated size in Foshan is significantly greater than that in Guangzhou due to its solid foundation and developed manufacturing industry, where its manufactured products are well-known both, at home and abroad. From 2016 to 2021, the number of high-tech enterprises in Guangzhou increased from 4,700 to 12,000, with an average annual growth rate of 20.62%, whereas the number of high-tech enterprises in Foshan increased from 1,388 to 7,100, with an average annual growth rate of 38.76%, which is about 18.4% higher than that in Guangzhou. Guangzhou has a strong scientific and technological innovation ability, gathering many high-tech enterprises, while the development momentum of Foshan's high-tech enterprises is obviously slower than Guangzhou's; thus, it is possible to stimulate the innovation vitality of the main body of enterprises through the effectual momentum of Guangzhou's high-tech enterprises [5].

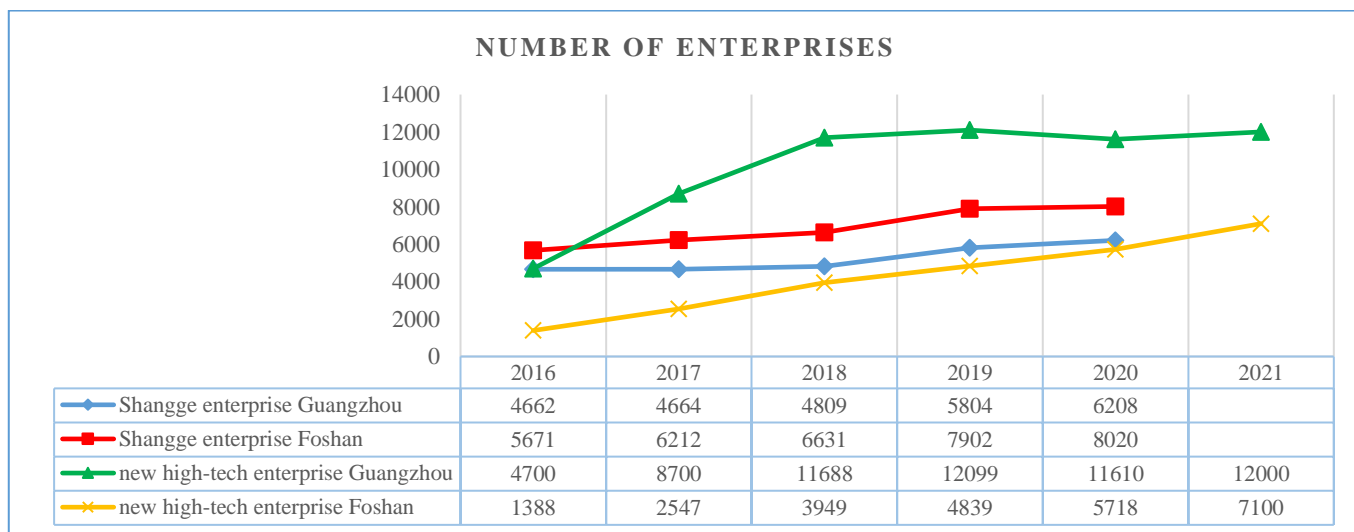


Figure 1. Number of enterprises (Source: Guangdong Statistical Yearbook)

2.3. Nine major industries that have their own characteristics in Guangfo manufacturing industry

As shown in **Figure 2**, the maximum location entropy in Guangzhou's automobile manufacturing industry is 4.18, which indicates that Guangzhou has significant advantages in the automobile manufacturing industry and makes the largest contribution to the industrial added value [6]. Guangzhou's petrochemical and pharmaceutical manufacturing industries have location entropies of 3.72 and 1.87, respectively, which offers excellent advantages but places them in a weak position in the electrical machinery industry [7].

Foshan’s electrical machinery has great advantages, with a location entropy of 2.37, which is about eight times that of Guangzhou. Secondly, Foshan has a greater location entropy in the metal manufacturing industry compared to Guangzhou (1.65 versus 0.28). Guangfo, the hub of the Guangdong-Hong Kong-Macao Greater Bay Area, is home to nine manufacturing industries, each having unique traits that can complement the advantages of the other [8].

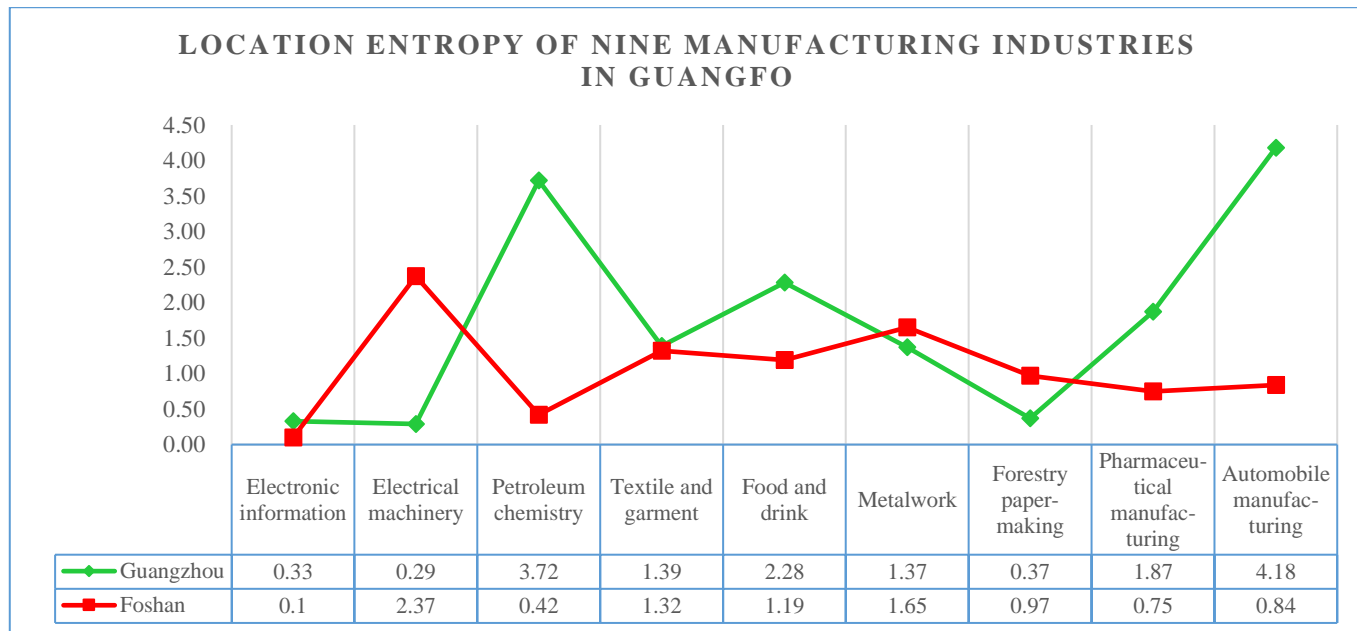


Figure 2. Location entropy of nine manufacturing industries in Guangfo in 2020 (Source: Guangdong Statistical Yearbook)

At present, Guangzhou-Foshan City has achieved a great leap forward in terms of development, substantially enhancing the comprehensive strength of the two cities. An industrial cluster with increasingly ideal supporting facilities has been formed as a result of the gradual integration of infrastructure into the network, the optimization of regional industrial layout, the connection with public services, and the strengthening of industrial correlation [9]. However, there are still some issues in the development process, such as the homogenization and competition of industrial development, an incomplete integration of industrial chain and innovation chain, as well as the need to improve the innovative coordination system [10].

3. Countermeasures for the innovation and development of the industrial chain in Guangfo City

3.1. Realizing regional advanced industrial base and modern industrial chain

In order to realize the upgrading of regional industrial base and the modernization of industrial chain under the new pattern, the first step is to grasp the primary relationship [11]. The development space of Guangzhou-Foshan must be expanded in the unified domestic market, so as to maximize the advantages of Guangzhou as a national central city. As a well-known manufacturing city, Foshan transforms Guangzhou-Foshan into a power source or hub for regional industrial coordination and integration in the Guangdong-Hong Kong-Macao Greater Bay Area, integrating and sharing resources, as well as complementing and strengthening the transregional industrial base [12].

The second step is to focus on major industries [13]. It is imperative to focus on building and promoting the development of four trillion-level industrial clusters: advanced equipment manufacturing, automobiles, new generation information technology, as well as biomedicine and health [14]. In order to promote the transformation and upgrading of traditional industries, such as petrochemical, household appliances, textile

and clothing, as well as food and beverage, digital economy and the use of advanced information technology must be vigorously developed and accelerated, respectively ^[15]. The third is to seize major enterprises. It is necessary to strengthen scientific and technological innovation-driven enterprises, identify high-tech enterprises in Guangzhou and Foshan, as well as promote the development of scientific and technological enterprises in the two cities to become national high-tech enterprises ^[16].

3.2. Promoting the deep integration of industrial chain and innovation chain

In deepening the integration of the industrial chain between Guangzhou and Foshan with the innovation chain, adhering to industrialization ^[17], upgrading the industrial chain around the innovation chain, as well as accelerating the transformation and upgrading of regional industrial structure driven by innovation ^[18], the first step is to clarify and optimize the positioning and cooperation between the two cities in terms of scientific and technological innovation ^[19], improve the collaborative innovation of “industry-university-research,” create an innovative pattern with Guangfo as the fulcrum, constantly popularize the Greater Bay Area, and actively position the innovation chain around the industrial chain ^[20].

The second step is to promote the deep integration and development of modern service industry and advanced manufacturing industry in the two cities by building a north-south Guangzhou-Foshan industrial integration and development belt, integrating the district-specific development conditions, and focusing on the four industries of advanced equipment manufacturing, automobile, new generation information technology, and biomedicine and health, so as to support the integration and development of manufacturing and the internet.

3.3. Optimizing the spatial layout of collaborative innovation

The first step is to clarify the functional positioning of innovation in Guangzhou-Foshan City. Guangzhou should give full play to its abundant talent resources in science and technology and build a national innovation center with international influence. On the other hand, Foshan should give full play to intelligent manufacturing, technology, and finance as well as build a national manufacturing innovation center that is open to the world. The second step is to establish and improve the cross-regional collaborative innovation policy system by establishing regional management and coordination mechanisms involving science and technology projects at all levels as well as explore the mutual recognition system of scientific research projects, independent innovation products, and rewards.

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