Effects, Constraints and Upgrading Strategies of Industrial Synergy Development in Guangdong-Hong Kong-Macao Greater Bay Area

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Abstract: Taking the industrial development of Guangdong-Hong Kong-Macao Greater Bay Area as an example and based on the industrial data of Bay Area in 2016 and 2019, this paper studies the effects and constraints of industrial collaborative development before and after the implementation of the "Guangdong-Hong Kong-Macao Greater Bay Area" strategy.

1. Introduction

The Guangdong-Hong Kong-Macao Greater Bay Area is composed of nine cities in the Pearl River Delta and two districts——Hong Kong and Macao. The Strategy of Guangdong-Hong Kong-Macao Greater Bay Area is an important national strategy that has been personally planned and deployed by the President [1]. As early as 2015, The *Vision and Action of the 21st Century Maritime Silk Road* issued by the National Development and Reform Commission, the Ministry of Foreign Affairs and the Ministry of Economic Development of the Silk Road have clearly stated the Greater Bay Area strategy is to build a bridgehead that can lead China's economy to high-quality development [2]. In the 2016 performance report, the Government of Guangdong province proposed to "adopt modernization measures for the development of the Bay Area". [3], that is to say, 2016 is the first year for the implementation of the strategy. The coordinated development of intercity industries in the Great Gulf area of Guangdong-Hong Kong-Macao is the basis and prerequisite for implementing the Great Bay Area Strategy. At present, it has been more than five years since the implementation of the "Greater Bay Area" strategy. How effective the implementation of the coordinated development of industries is, what constraints it faces, and how to better promote the coordinated integration and innovative development of industries in the Greater Bay Area are important topics that urgently need to be studied at this stage.

It is true that the academic community has produced rich research results on the coordinated development of industry in the Greater Bay Area. For example, Yang, G.S. (2017) believes that the establishment of an inter-city communication platform in the Greater Bay Area is the key to promote

the collaborative development of industries among cities [4]. Shen, M.H. (2017) believes that transportation connectivity [5], industry co-prosperity, market co-construction, and institutional mechanism interconnection are the paths to realize the coordinated development of the Greater Bay Area urban agglomeration. Zhao, X.K. (2017) proposes the establishment of the Greater Bay Area Industrial Collaborative Development Committee to promote the division of labor and cooperation among cities in Guangdong [6], Hong Kong and Macao through laws and systems. Gu et al. (2018) believe that the transfer of the Bay Area is a leading cluster in the world [7], requiring industrial cooperation, human resources, financial services and infrastructure deployment. Chen, Y. (2018) uses grey correlation to analyze the industrial synergy among cities in Greater Bay Area, and proposes to establish an industrial development cooperation mechanism to promote the integration of industries with different advantages, so as to realize the coordinated and integrated development of industries in the Bay Area. [8]. Xia-e Hu (2022) uses the composite system principle to analyze the factors affecting the industrial synergy between cities in the Greater Bay Area, and then puts forward measures such as optimizing and adjusting the industrial structure, innovating the investment and financing mechanism, and improving the innovation ability to promote the industrial synergy and integration in the Bay Area [9].

Up to now, the research on industrial development in the Bay region is very extensive. From quantification to quantification, industry order, industry relations, industry relations, etc., a large number of industrial cooperation studies have been conducted. However, there is little literature to compare before and after the implementation of the Greater Bay Area strategy. Therefore, this paper suggests to compare the industrial development data of 2019 and 2016, analyze the influence of cooperation in the Bay Area, study the reasons that restrict development, and finally put forward some suggestions to promote cooperative development.

2. Industrial Development Level Before and After the Implementation of the "Greater Bay Area" Strategy

The "Greater Bay Area" consists of Hong Kong, Macao and nine cities in the Pearl River Delta. Due to the different historical backgrounds, development levels and resource endowment advantages of each city, its industrial structure, regional GDP and per capita GDP are different. After three years of implementation of the "Guangdong-Hong Kong-Macao Greater Bay Area" strategy, what is its industrial development level? This section will compare and analyze the data of statistical yearbook.

Table 1 compares the industrial structure, regional GDP and per capita GDP of each city before and after the implementation of the Strategy. As can be seen from Table 1, except Dongguan, where the proportion of the tertiary industry dropped by nearly 10% three years after the implementation of the "Greater Bay Area", the industrial structure of other cities showed a trend of shifting from industrial structure to service structure, and the proportion of the tertiary industry rose in different ranges, but obviously at a slow pace. It can also be seen from Table 1 that in the industrial structure data of 2019, the proportion of the tertiary industry in Hong Kong and Macao is 93.1% and 95.8% respectively, showing obvious characteristics of the service economy. In other cities, the proportion of tertiary industry in Guangzhou, Shenzhen and Zhuhai is 71.6%, 60.9% and 53.8%, respectively, indicating that they have entered the stage of service economy, but still not obvious enough. The proportion of the tertiary industry in the other six cities is all below 50%, indicating that the secondary industry is the main industry and they are in the stage of industrial economy.

Three years after the implementation of the Strategy, the data of 2019 has not changed much compared with the data of industrial structure in 2016. The level of industrial development among cities in the Bay Area is still uneven, and the effect of industrial collaborative development is still not outstanding. In addition, from the perspective of regional GDP and per capita GDP in Table 1,

compared with the data in 2016, the cities in the Bay Area have improved to different degrees, but the increase is not large. Among them, the regional GDP and per capita GDP of Zhongshan City have declined rather than increased. The regional GDP dropped from 320.2778 billion yuan to 30.9755 billion yuan, and the per capita regional GDP dropped from 99,471 yuan to 92,588 yuan, indicating that the effect of coordinated industrial development was not obvious after the implementation of the "Greater Bay Area" strategy, and the level of industrial development among cities was still unbalanced.

Table 1: Comparison of industrial structure, regional GDP and per capita GDP of cities in the Greater Bay Area in 2016 and 2019.

City	Industrial structure		regional GDP (100 million yuan)		per capita GDP (yuan)	
	In 2016	In 2019	In 2016	In 2019	In 2016	In 2019
Guangzhou	1.22:29.42:69.35	1.1:27.3:71.6	1954.7442	2359.9628	141933	156238
Shenzhen	0.04:39.91:60.05	0.1:39.0:60.9	1949.2601	2689.3737	167411	203234
Zhuhai	1.96:48.50:49.54	1.7:44.5:53.8	222.6370	343.1909	134546	175330
Foshan	1.68:59.63:38.69	1.5:56.2:42.3	863.0000	1073.8065	115891	133687
Huizhou	5.03:53.85:41.12	4.9:51.9:43.2	341.2167	417.2584	71605	85946
Dongguan	0.35:46.48:53.17	0.3:56.5:43.2	682.7687	947.0994	82682	112369
Zhongshan	2.13:52.37:45.50	2.0:49.1:48.9	320.2778	309.7055	99471	92588
Jiangmen	7.81:47.58:44.61	8.1:43.0:48.9	241.8781	314.2529	53374	68108
Zhaoqing	15.21:47.96:36.83	17.2:41.2:41.7	208.4019	224.6140	51178	53873
Hong Kong	0.1:7.3:92.4	0.1: 6.8:93.1	2130.0200	2498.7136	291959	335357
Macao	0:8.89:91.11	0:4.2:95.8	297.6000	379.5081	488443	574799

Note: The data come from the *China City Statistical Yearbook*, the Census and Statistics Department of the Hong Kong Special Administrative Region Government and the Statistics and Census Bureau of the Macao Special Administrative Region.

3. Effects of Coordinated Industrial Development in the Greater Bay Area

3.1. The Degree of Urban Industrial Structure Isomorphism in the Greater Bay Area is Still Relatively High

This part uses structural similarity coefficient to measure the convergence of urban industrial structure in Bay Area. The specific formula is as follows:

$$W_{ef} = \frac{\sum_n X_{en} Y_{fn}}{\sqrt[2]{\sum_n X_{en}^2 \sum_n Y_{fn}^2}} \tag{1}$$

Among them, W_{ef} represents the similarity coefficient of industrial structure between regions e and f, and Wen and W_{fn} represent the proportion of n sector in the industrial structure of regions e and f, respectively. If $W_{ef} = 1$, it indicates that the industrial structure of e region and f region is completely the same. If $W_{ef} = 0$, it indicates that the industrial structure of the two places is completely different. If the value of W_{ef} is between 0 and 1, it indicates that the industrial structure of the two places is different.

If you replace the data in the above formula, you will get similar results to the industrialization of bays and other cities in 2016 and 2019, as shown in Table 2.

As can be seen from the results in Table 2, the industrial structure similarity coefficient of the 11 cities in the Greater Bay Area in 2016 and 2019 has little change. The industrial structure similarity

coefficient of the nine cities in the Pearl River Delta in the two years is above 0.8, only Hong Kong and Macao are less than 0.8. The average coefficient of industrial structure similarity of cities in the Greater Bay Area was 0.879 in 2016, which decreased to 0.869 in 2019, indicating that the industrial structure of the Greater Bay Area showed a certain degree of alienation, but the degree was small. Among them, the industrial structure similarity coefficient of Guangzhou, Zhongshan and Macao developed from 2016 to 2019, instead of decreasing, it increased. However, the other 9 cities showed a decrease in the coefficient of industrial structure similarity. Three years after the implementation of the "Greater Bay Area" strategy, the urban industrial structure is still highly isomorphic.

Table 2: Similarity coefficient of industrial structure in the Greater Bay Area in 2016 and 2019.

City	2016	2019
Guangzhou	0. 910	0.918
Shenzhen	0. 935	0.932
Zhuhai	0. 925	0.921
Foshan	0. 885	0.863
Huizhou	0. 903	0.845
Dongguan	0. 936	0.926
Zhongshan	0. 869	0.879
Jiangmen	0. 921	0.905
Zhaoqing	0. 889	0.874
Hong Kong	0. 772	0.769
Macao	0. 725	0.726

Note: The data are from *China City Statistical Yearbook*, Census and Statistics Department of the Hong Kong Special Administrative Region Government and Statistics and Census Bureau of the Macao Special Administrative Region.

3.2. There Were Significant Differences in the Quantity and Distribution of Locational Entropy among Industries in the Greater Bay Area

This section uses locational entropy to reflect the widening gap between cities in the Greater Bay Area. Generally speaking, locational entropy is used to judge the specialization level of a specific industry in a specific region. This paper intends to use the ratio of the employment number of a specific industry in the Bay area to the employment number in the Bay area, and the ratio of the employment number of the industry to the national employment number. If the locational entropy is greater than 1, it indicates that the industry has comparative advantages in the Greater Bay Area. If the locational entropy is less than or equal to 1, it indicates that the industry lacks comparative advantages.

The specific calculation formula is:

$$WQ_{ef} = \frac{W_{ef}/\sum_{f=1}^{m} W_{ef}}{\sum_{e=1}^{n} W_{ef}/\sum_{e=1}^{n}\sum_{f=1}^{m} W_{ef}} \tag{2}$$

Among them, e represents the e-th region (e takes the values 1,2,3... N); f represents the f-th industry (f values 1,2,3... m); The W_{ef} represents the number of people employed in the f industry in the e region; WQ_{ef} represents the locational entropy of the f industry in region e. According to the above formula, we calculated the locational entropy values of the 11 cities in the Greater Bay Area in 2016 and 2019, including agriculture, manufacturing, transportation, warehousing and postal services, wholesale and retail, accommodation and catering, finance and real estate. The results are shown in Table 3.

According to the agricultural location entropy in Table 3, the location entropy of all cities does not exceed 1.5, indicating that the traditional agriculture in Guangdong, Hong Kong and Macao is not dominant, but Guangzhou, Dongguan, Huizhou and Zhaoqing are greater than 1.0. Therefore, relatively speaking, the agriculture in these four cities is relatively concentrated. In addition, the locational entropy of other cities is less than 1.0, and the locational entropy of agriculture in Hong Kong and Macao is almost close to 0, indicating that the degree of agricultural agglomeration in Hong Kong and Macao is very low and there is no comparative advantage.

It can be seen from the calculation results of manufacturing locational entropy in Table 3, in addition to Guangzhou, Hong Kong and Macao location entropy is less than 1.0, locational entropy is greater than 1.0 in other cities, and in 2016 in Dongguan, Foshan, Jiangmen, Zhongshan, Huizhou five cities of locational entropy is greater than 2.0, after 3 years of development to reduce to 2.0 below, In 2019, only Guangzhou, Hong Kong and Macao have a locational entropy less than 1, indicating that the cities in Guangdong, Hong Kong and Macao are still dominated by manufacturing after several years of development.

Table 3: Sectional location entropy of cities in the Greater Bay Area in 2016 and 2019.

Industry	Year	Guangzhou	Shenzhen	Zhuhai	Dongguan	Foshan	Jiangmen	Zhongshan	Huizhou	Zhaoqing	Hong Kong	Macao
Agriculture	2016	1.28	0.67	0.32	1.48	0.76	0.72	0.72	1.46	1.01	0.000	0.000
	2019	1.35	0.61	0.30	1.61	0.68	0.77	0.56	1.50	1.01	0.000	0.000
Manufacturing	2016	0.976	1.931	1.956	2.985	2.649	2.004	2.665	2.639	1.866	0.123	0.080
	2019	0.857	1.312	1.430	1.589	1.8798	1.573	1.623	1.673	1.131	0.084	0.045
Transportation, warehousing and postal services	2016	2.044	1.168	0.739	0.277	0.505	0.696	0.399	0.461	0.599	1.331	1.126
	2019	1.515	0.678	0.446	0.752	0.928	0.804	0.503	0.487	0.999	1.254	0.578
Wholesale and retail trade	2016	1.880	1.339	1.136	0.567	0.742	1.012	0.858	0.596	1.140	5.846	2.498
	2019	1.121	0.804	0.735	0.874	0.521	0.567	0.746	0.785	0.745	1.578	0.430
Accommodation and catering	2016	2.283	1.573	2.269	0.820	0.757	1.274	1.107	0.631	0.977	6.635	10.520
	2019	0.908	0.790	0.953	0.839	0.359	0.638	0.510	1.088	1.283	1.430	2.717
Financial	2016	1.028	0.638	0.687	0.348	0.455	1.211	0.529	1.056	0.792	2.117	0.775
	2019	0.849	1.214	0.680	0.563	0.405	0.471	0.538	0.462	0.331	1.696	0.607
The real estate	2016	2.607	1.911	1.839	0.488	0.941	0.801	1.075	0.812	0.865	1.904	0.000
	2019	0.768	0.759	0.665	0.787	0.804	0.549	0.693	0.757	0.547	1.828	0.953

According to the locational entropy of wholesale and retail trade in Table 3, the locational entropy of Hong Kong and Macao in 2016 is 2.0 higher than that of other cities, and the locational entropy of Dongguan, Foshan, Zhongshan and Huizhou is less than 1.0. By 2019, only Guangzhou and Hong Kong had locational entropy greater than 1.0. According to the locational entropy of transportation, warehousing and postal industry in Table 3, only Guangzhou and Hong Kong have always maintained a value greater than 1.0, which also verifies the role of Guangzhou and Hong Kong in the transportation link in the Greater Bay Area. In terms of locational entropy of accommodation and catering industry, Hong Kong and Macao were above 1.0 in 2016 and 2019, while Huizhou and Zhaoqing were above 1.0 in 2019. Among the locational entropy of financial industry and the real estate industry, only Hong Kong was greater than 1.0 in 2016 and 2019, and the agglomeration degree of other cities was not large. This shows that the service industry development level of most cities in the Bay Area is still not high, only Hong Kong and Macao are relatively dominant in the service industry, and Guangzhou is relatively concentrated compared with other cities in the Pearl River Delta.

Table 4 shows the locational entropy ranking of cities in the Greater Bay Area in 2016 and 2019.

Table 4 shows that Dongguan, Huizhou, Guangzhou and Zhaoqing have the advantage in agriculture in 2016, and the locational entropy is greater than 1.0. In 2019, the ranking is still unchanged.

In 2016, Dongguan, Foshan, Zhongshan, Huizhou and Jiangmen were the dominant cities in manufacturing industry, with locational entropy greater than 2.0, and Dongguan's locational entropy was even close to 3.0. The top five manufacturing cities in 2019 are these five, but the ranking has changed, and their locational entropy has all dropped to between 1.5 and 2.0.

In 2016, Hong Kong, Macao, Guangzhou and Shenzhen ranked the top four in terms of location entropy of wholesale and retail trade industry, while in 2019, Hong Kong, Guangzhou, Dongguan and Shenzhen ranked the top four. In 2019, compared with 2016, Dongguan ranked the top four. In terms of locational entropy in 2016 and 2019, Guangzhou and Hong Kong ranked the top two in terms of locational entropy in transportation, warehousing and postal services industry, respectively. And the actual situation of accommodation and catering industry, the financial industry, and the real estate industry are basically the main entropy values of Hong Kong, Macao and Shenzhen.

Table 4: Locational entropy Ranking of cities in the Greater Bay Area in 2016 and 2019.

Industry	Year	City ranked No.1	City ranked No.2	City ranked No.3	City ranked No.4	City ranked No.5
Agriculture	2016	Dongguan	Huizhou	Guangzhou	Zhaoqing	——
	2019	Dongguan	Huizhou	Guangzhou	Zhaoqing	——
Manufacturing	2016	Dongguan	Foshan	Zhongshan	Huizhou	Jiangmen
	2019	Foshan	Zhongshan	Huizhou	Dongguan	Jiangmen
Wholesale and retail trade	2016	Hong Kong	Macao	Guangzhou	Shenzhen	——
	2019	Hong Kong	Guangzhou	Dongguan	Shenzhen	——
Transportation, warehousing and postal services	2016	Guangzhou	Hong Kong	Shenzhen	Macao	——
	2019	Hong Kong	Guangzhou	Zhaoqing	Foshan	——
Accommodation and catering	2016	Hong Kong	Macao	——	——	——
	2019	Macao	Hong Kong	——	——	——
Financial	2016	Hong Kong	Guangzhou	——	——	——
	2019	Hong Kong	Shenzhen	——	——	——
The real estate	2016	Guangzhou	Shenzhen	Hong Kong	——	——
	2019	Hong Kong	Macao	Foshan	——	——

From the above results, it can be seen that the locational entropy of Hong Kong service industry is greater than 1, and the advantages are very obvious. The industrial location of Dongguan, Foshan, Jiangmen, Zhongshan and Huizhou is greater than 1, which shows obvious advantages, but also shows that their industrial development is extremely unbalanced. Guangzhou, Dongguan, Huizhou and Zhaoqing have relative advantages in agriculture. The locational entropy of most industries in Guangzhou is greater than or close to 1, indicating that the industries in Guangzhou belong to the balanced development type. Macao's wholesale and retail trade industry, accommodation and catering industry have great advantages, which can be integrated with the manufacturing and real estate industries of neighboring Zhuhai. As can be seen from Table 4, the location entropy ranking of various industries in the Greater Bay Area shows that most of the location entropy of Zhaoqing and Jiangmen does not have advantages. Zhaoqing only appears once in the location quotient ranking, and Jiangmen only appears twice, and the ranking is low. Moreover, their economic aggregates are generally weak. Table 1 also shows that the per capita GDP of these two cities ranks the first and second lowest among the cities in the Greater Bay Area, and the scale of industrial development is low. The subsequent development should take advantage of the industrial coordination strategy of the Bay Area to highlight local characteristics, enhance economic aggregates, and accelerate the

upgrading of urban development level.

In general, the locational entropy of different cities and industries in the Bay Area has obvious differences in number and distribution, indicating that the industrial structure development among cities in the Bay Area is not balanced, but it provides basic support for urban coordination in the Bay region.

3.3. Measurement of Industrial Synergy Degree of "Guangdong-Hong Kong-Macao Greater Bay Area"

In this paper, Greater Bay Area industry is regarded as a composite system, and it is calculated according to the calculation method of synergy degree of composite system. The specific formula is as follows:

$$\varphi = \sqrt{\left| \prod_{i=1}^{3} \left(u_i^1(S_i) - u_i^0(S_i) \right) \right|} \tag{3}$$

Among them, the value range of φ is 0-1,0 is the base period, 1 is the report period; $u_i(S_i)$ is the order degree of the three subsystems of 9 cities in the Pearl River Delta, Hong Kong and Macao, which is calculated according to the WQ_{ef} formula.

Finally, the synergy degree of the industry in the Greater Bay Area in 2016 is 0.0446, and the synergy degree of the industry in the Greater Bay Area in 2019 is 0.1166. According to the judgment convention of the synergy degree of the composite system, a φ value between 0 and 0.3 indicates a low level of synergy, a φ value between 0.3 and 0.6 indicates a general level of synergy, a φ value between 0.6 and 0.8 indicates basic synergy, a φ value between 0.8 and 0.9 indicates good synergy, and a φ value between 0.9-1 indicates a high degree of synergy. Although the synergy level of industries in the Bay Area has been greatly improved from 2016 to 2019, it is still at a low level in general. The degree of industrial synergy in the Great Bay area is still very low, and it needs to be strengthened urgently.

4. Constraints on the Implementation of Great Bay Strategy

The Greater Bay Area has a strong development momentum, with a relatively complete industrial system and a large industrial scale. However, from the data analysis of the first part of the "Greater Bay Area" three years before and after the implementation of the strategy, it can be seen that the industrial development level among cities is still unbalanced, the degree of industrial structure isomorphism is still high, there are obvious differences in the quantity and distribution of locational entropy among cities, and the degree of industrial synergy is low. The overall industrial collaborative development effect is not good, and the main reasons are the synergy barriers caused by institutional factors and interest factors; lacking of technological development and technological innovation; the low speed of servitization transformation.

4.1. It Is Difficult to Construct System Coordination and Interest Coordination Mechanism

Due to historical reasons, the system implemented in Hong Kong and Macao is different from that of the cities in the Pearl River Delta. Both in terms of political system and administrative examination and approval system, there are obstacles to the coordinated development. The Bay Area lacks an organization to manage all the cities in the Bay Area in a unified way. As a result, the Greater Bay Area cannot make plans as a whole. Each city is doing its own business and planning its own industry and economy. In the future, the Bay Area must establish a Bay Area organization, unified command and planning, break the barriers of different political and economic systems among the cities in the

Bay Area, so as to optimize the allocation of resources in the Bay Area and coordinate the development of the Bay Area industry.

4.2. Investment in Basic Research and Development of Science and Technology Is Insufficient, and the Transformation Rate of Scientific and Technological Innovation Is not High

According to the existing data, compared with the existing three international first-class Bay areas, the current Bay Area is still seriously short of human resources, especially the lack of high-end innovative talents, resulting in the lack of scientific and technological research and development, the lack of transformation of scientific and technological innovation achievements and other serial problems. Hong Kong, a part of the Greater Bay Area, has many strong international universities, but its transformation rate of scientific and technological innovation is not too high. There are still no "unicorn" enterprises with strong influence, and the spillovers of scientific and technological benefits are still not high. In addition, although Shenzhen in the Bay Area is a gathering place of talents in China and has certain attraction of talent gathering, the transformation of scientific and technological innovation achievements is still insufficient, and it fails to coordinate innovation with other cities well. In the Bay Area, Hong Kong and Shenzhen are in the same situation in terms of R&D and transformation of science and technology, and other cities are even worse. In general, the Greater Bay Area has insufficient basic R&D of science and technology, and the conversion rate of scientific and technological innovation achievements is still low.

4.3. Industrial Transformation and Upgrading in the Greater Bay Area Is Slow

The agglomeration of advantageous industries is the key to the rapid development of the Bay Area [10]. Industrial agglomeration is conducive to the general improvement of the regional industrial level. However, the Bay Area has not formed a unique overall industrial agglomeration at present. According to the inter-industry locational entropy of cities in the Bay Area, except for Hong Kong and Macao, which are obviously dominated by service industries, Shenzhen and Guangzhou have a certain degree of servitization. Although other Bay Area cities also have the trend of servitization, the speed is still relatively slow, and the proportion of producer services in regional GDP is still far behind that of developed economies. The concept and capacity of producer services are still insufficient, and large-scale producer services have not yet been formed, which cannot meet the needs of the transformation and upgrading of producer enterprises.

5. Conclusions and Policy Suggestions

5.1. Conclusions

This paper shows that the synergistic development of industries in the "Guangdong-Hong Kong-Macao Greater Bay Area" is not effective, mainly reflected in the uneven level of industrial development among the cities in the Bay Area, the degree of industrial structure isomorphism is still high, and the number and distribution of locational entropy among the cities in the Bay Area are still significantly different. There are three reasons for the lack of optimal cooperation in industrial development in the Bay region: the industrial coordination mechanism has not been established; Insufficient investment in technology construction and low conversion rate of technological innovation; The transformation and upgrading of industries in the Bay Area is slow. In the future, we should set up an overall planning organization at the national level and build a mechanism of interest coordination. Moreover, we'd better increase investment in basic research and development and build institutions for transforming scientific and technological innovation achievements. We will also build

a modern service industry system and promote industrial transformation and upgrading in the Bay Area to promote the coordinated development of industries in the Bay Area.

5.2. Policy Suggestions on Improving the Implementation Effect of the Bay Area Strategy

5.2.1. Establish an overall Coordination Organization and Build A Coordination Mechanism of Interests

Establish a government organization of the Greater Bay Area, which is independent of Hong Kong, Macao and the Pearl River Delta, and through unified command and planning of the industrial layout of the Greater Bay Area, break down the barriers of different political, social and economic systems among the cities in the Bay Area, realize the optimal allocation of resources in the Greater Bay Area, and promote the coordinated development of industries in the Bay Area. On this basis, an industrial interest coordination mechanism should be constructed to eliminate industrial incompatibility, repeated construction and vicious competition among the cities in the Bay Area. The Bay Area should be regarded as a whole, and a high-level and open platform for cooperation and sharing should be built, so that the interests of the cities in the Bay Area will not be one and the other but the strong and strong, so as to promote the high-quality and coordinated development of the industries in the Bay Area.

5.2.2. Increase Investment in Basic Research and Development and Build Institutions for Transforming Scientific and Technological Innovation

The investment in basic research and development in the Greater Bay Area is still insufficient. According to the Guangdong Statistical Yearbook, the basic research expenditure of Guangdong Province in 2019 only accounted for 4.6% of the total social research and experimental development expenditure in Guangdong, significantly lower than the national average of 6.0%, and certainly lower than that of Zhejiang, Jiangsu and other coastal provinces. Although the current basic research investment of Hong Kong and Shenzhen is relatively large, it is not enough to lead the Greater Bay Area to catch up with other world-class bay areas in the world. Therefore, it is necessary to increase the basic research and development investment of the Greater Bay Area to improve the basic innovation ability of science and technology. In addition, it is necessary to establish a coordinated organization for the transformation of scientific and technological innovation achievements, set up a large platform for scientific research network exchange in the Greater Bay Area, make full use of the existing scientific and technological innovation resources in the Greater Bay Area, especially those in Hong Kong and Shenzhen, accelerate the attraction of global high-tech talents, accelerate the training of local high-tech talents, and accelerate the transformation of scientific research achievements in the Greater Bay Area, so as to realize the industrialization of scientific research achievements.

5.2.3. Build A Modern Service Industry System and Promote the Transformation and Upgrading of Industries in the Bay Area

At present, the trend of servitization of industries in the Greater Bay Area has emerged, but the development rate is still slow, and the pattern of industrial manufacturing has not changed. According to the development history of the three relatively well-developed Bay areas in the world, the Greater Bay Area must accelerate industrial transformation and upgrading. By giving full play to the technological innovation advantages of Hong Kong and Macao, and using Guangzhou and Shenzhen as the headquarters and bases, the industries of the other seven cities in the Bay Area should accelerate the transformation into high-end manufacturing, productive services, living services, and high-end

extension of the value chain and high-quality transformation. Thus, gradually form the modern service industry system of mutual cooperation and complementary advantages.

Acknowledgment

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