

Study on the Present Situation, Problems and Countermeasures of Dual Circulation Development in the Guangdong-Hong Kong-Macao Greater Bay Area

Qing Guo^{1,2}, Rong Gao²

¹Institute of Quantitative Economics and Technical Economics, Chinese Academy of Social Sciences, Beijing, China

²School of Economics and Trade, Guangdong University of Foreign Languages and Trade, Guangzhou, China

Email: qingguovip@gmail.com

How to cite this paper: Guo, Q., & Gao, R. (2022). Study on the Present Situation, Problems and Countermeasures of Dual Circulation Development in the Guangdong-Hong Kong-Macao Greater Bay Area. *Open Journal of Business and Management*, 10, 2127-2159.
<https://doi.org/10.4236/ojbm.2022.104108>

Received: May 20, 2022

Accepted: July 26, 2022

Published: July 29, 2022

Copyright © 2022 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Starting from the external circulation and internal circulation, this paper discusses the current situation, problems and countermeasures of each element of dual circulation. Although the Guangdong-Hong Kong-Macao Greater Bay Area has advantages in many aspects, there are still some problems, such as the relative unification of import and export direction, the relative concentration of product types, the imperfect supply chain, etc. In view of these problems, the paper puts forward the economic and legal measures to solve and improve, for the smooth operation of the dual circulation, security and stability to provide the basic security.

Keywords

The Guangdong-Hong Kong-Macao Greater Bay Area, Dual Circulation, Issues, Countermeasure

1. Introduction

1.1. Research Background and Significance

At present, the international economic environment is undergoing rapid and complex changes. Under the international background of intensified trade friction between China and the United States, the outbreak of the new crown epidemic and the contraction of the world economic market, the large risk of foreign investment, and the implementation of protectionism by all countries, China needs to give full play to the huge domestic market scale advantage and domestic demand potential, and open up the international and domestic dual circulations,

so as to improve the international competitiveness and the domestic economic security and stability. In order to cope with the changing world situation, China has put forward a strategic decision to build a new development pattern of “dual circulation”.

The state has issued corresponding policy guidance and maintained good cooperation and exchanges among cities. Specific policies and urban development include the following aspects. First of all is the construction of “two zones”. As a leading demonstration area of socialism with Chinese characteristics, Shenzhen is also one of the core cities of the Guangdong-Hong Kong-Macao Greater Bay Area. The second is the construction of free trade zones. Guangzhou, Shenzhen and Zhuhai have set up free trade pilot zones, and numerous preferential policies have provided a good business environment. Finally, at the two sessions in 2022, Premier Li Keqiang also proposed in the government work report to continue implementing the policy of adding and deducting the R&D expenses of enterprises, and to strengthen supervision and reduce the handling procedures, which is conducive to promoting the innovation and development of enterprises. All of these policies can further promote the construction of the Guangdong-Hong Kong-Macao Greater Bay Area, the economic strength and international competitiveness of the Bay Area have been significantly improved, and occupy an important position in the global economic market. As the constituent region of Guangdong, Hong Kong and Macao, each region has its own characteristics and advantages. Among them, Hong Kong is the international financial, trade and shipping logistics center, Macao is the world tourism center, and the gambling industry is developed, nine cities in the Pearl River Delta as the highest degree of opening to the outside world, also has an important strategic position. The Guangdong-Hong Kong-Macao Greater Bay Area is not only at the forefront in the strategic layout of the country’s opening to the outside world, but also one of the important pioneering areas in the new development pattern of “dual circulation”.

Under the continuous influence of global epidemic, the foreign economic downturn is difficult to alleviate for the time being, in addition, the domestic system and economic aspects also need to be improved. Therefore, while paying attention to the development of the foreign economy, the Guangdong-Hong Kong-Macao Greater Bay Area also needs to adjust the industrial structure and deepen the supply-side structural reform as soon as possible, so as to provide a strategic basis and strong impetus for the effective implementation of the national dual circulation strategy. At present, there are still some problems in the development pattern of the Guangdong-Hong Kong-Macao Greater Bay Area. Therefore, it is necessary to further clarify the substance of these problems by analyzing the data and understanding the actual situation, and exploring feasible solutions suitable for China and the Guangdong-Hong Kong-Macao Greater Bay Area.

1.2. Literature Review and Innovation

At present, the Guangdong-Hong Kong-Macao Greater Bay Area and dual cir-

circulation are both hot topics for discussion and research. There have been many studies on the Guangdong-Hong Kong-Macao Greater Bay Area and dual circulation. For example, [Guo and Lu \(2021\)](#) also put forward specific suggestions to improve the legal system and prevent legal risks from starting from the legal difficulties of realizing dual circulation in the Guangdong-Hong Kong-Macao Greater Bay Area. [Jin \(2021\)](#) analyzed the construction of the Guangdong-Hong Kong-Macao Greater Bay Area under the dual cycle from the perspective of industrial chain and supply chain security. Some scholars also discussed China's manufacturing upgrading and dual cycle promotion from the perspective of industrial chain. These studies are aimed at one aspect of the development of the Guangdong-Hong Kong-Macao Greater Bay Area under the double cycle. Although they are more detailed and persuasive, they have not yet fully grasped the current situation, problems and reasons of development.

[Jiang and Meng \(2021\)](#), [Li \(2021\)](#), [Jin and Wang \(2021\)](#) all discuss China's implementation path and practice direction by analyzing the international experience of dual circulation. [Shi and Zhou \(2021\)](#) and [Zhou et al. \(2021\)](#) all started from the theoretical logic of dual circulation to analyze the path choice in reality. These documents are also about the dual circulation and are not combined with the specific development of the Guangdong-Hong Kong-Macao Greater Bay Area.

[Fu and Zhang \(2020\)](#) specifically calculated the multi-dimensional index of foreign trade in goods in the Guangdong-Hong Kong-Macao Greater Bay Area, which separated the trade data within the Guangdong-Hong Kong-Macao Greater Bay Area that is not easy to be detailed, restored the real data, and became more authoritative. They also analyzed the characteristics of foreign trade in goods in the Guangdong-Hong Kong-Macao Greater Bay Area from the aspects of time and space characteristics, commodity structure and characteristics of trading partners, and put forward policy suggestions. [Liu et al. \(2019\)](#) analyzed the recent problems of the Guangdong-Hong Kong-Macao Greater Bay Area. [Liu et al. \(2019, 2020\)](#) also studied the development degree of regional integration of the Guangdong-Hong Kong-Macao Greater Bay Area and the Enlightenment of world-class Bay area to the Guangdong-Hong Kong-Macao Greater Bay Area. Some scholars analyzed the collaborative innovation and industrial structure convergence among cities in the Guangdong-Hong Kong-Macao Greater Bay Area. [Shi et al. \(2022\)](#) analyzed the impact of the development of the Guangdong-Hong Kong-Macao Greater Bay Area on the ecological environment from the impact of urbanization on the coastline and coastal zone. These studies are only limited to the development of the Guangdong-Hong Kong-Macao Greater Bay Area, and do not link it with the new development pattern of dual circulation.

To sum up, there are few studies on comprehensively grasping the current situation, problems and Countermeasures of the dual cycle new development

pattern of the Guangdong-Hong Kong-Macao Greater Bay Area as a whole. Therefore, this paper hopes to more accurately show the gap and relationship between the elements by measuring the simple Gini index, further analyze the current situation and problems of the internal and external circulation from more factors, and put forward conclusions and suggestions.

1.3. Research Contents and Methods

The organizational structure of this paper is as follows, which is mainly divided into three parts: the current situation, problems and Countermeasures of the dual cycle development of the Guangdong-Hong Kong-Macao Greater Bay Area. Firstly, the development status of internal and external circulation factors in the Guangdong-Hong Kong-Macao Greater Bay Area in recent years is visually displayed through charts and other forms; Then it puts forward the outstanding problems of the dual circulation development of the Guangdong-Hong Kong-Macao Greater Bay Area; Finally, it summarizes the research conclusions and puts forward policy recommendations. However, there are some limitations in this paper. As it covers a wide range of professional issues, such as laws and systems, the suggestions are only superficial, without considering their practicality and operability.

The main research methods are as follows: 1) measure the income gap between urban and rural residents in the Guangdong-Hong Kong-Macao Greater Bay Area by measuring the simple Gini coefficient. 2) Regression analysis is used to measure the relationship between per capita consumption expenditure and per capita disposable income of urban and rural residents. 3) Show the data characteristics through statistical charts and other forms, conduct data analysis, and find out the problems and their causes. 4) Integrate the research results of previous scholars to broaden or deepen.

1.4. Data Selection and Use

The data used in this paper are the statistical yearbook issued by the official institutions and the data of the government statistics office. The time range of the data is mainly 2019. For example, the data of the nine cities in Guangdong Province are all from the Guangdong statistical yearbook 2020, the data of Hong Kong are from the official website of the Statistics Department of the Hong Kong SAR government, and the data of Macao are from the official website of the Macao Trade and Investment Promotion Bureau.

2. Analysis on the Current Situation of Dual Circulation Development in the Guangdong-Hong Kong-Macao Greater Bay Area

In this paper, the analysis of the present situation of the dual circulation development in the Guangdong-Hong Kong-Macao Greater Bay Area is mainly based on the internal and external circulation as the dividing criteria.

2.1. Development Status of External Circulation

The external circulation mainly includes the trade exchanges and investment activities between the region and foreign countries. Therefore, this paper takes the data of import and export trade, foreign investment and transportation of the Guangdong-Hong Kong-Macao Greater Bay Area as the facts basis, and takes the overall and regional two angles as the entry points to show the actual development.

2.1.1. The Total Amount of Foreign Trade Is Large and the Characteristics of Trade Data Are Obvious

According to the Guangdong Statistical Yearbook 2020 published by the Guangdong Provincial Bureau of Statistics, the economy of The Guangdong-Hong Kong-Macao Greater Bay Area in 2019 still maintained steady growth under the adverse factors such as world economic market contraction and high risk of external investment, and the regional GDP was 1.68 trillion US dollars. By sorting out the total import and export data of The Guangdong-Hong Kong-Macao Greater Bay Area in 2019, the following four characteristics can be summarized.

1) The total amount of import and export trade is large, and there are differences between east and west banks

The Guangdong-Hong Kong-Macao Greater Bay Area has a large import and export total, accounting for nearly 50% of the country. In the context of the construction of Guangdong Free Trade Zone, the total import and export amount of the Guangdong-Hong Kong-Macao Greater Bay Area in 2019 is 2.08 trillion US dollars, of which, the total export amount is 1.11 trillion US dollars, the total import amount is lower than the total export amount, is 97 million US dollars. It can be seen that foreign trade forms a trade surplus, which makes more foreign capital flow into our country and promotes economic development. Total exports and imports from the Greater Bay Area accounted for 44.40% and 46.63% of the total national exports (\$2.50 trillion) and total national imports (\$2.08 trillion), respectively, close to 50%. Therefore, the development of import and export trade in the Guangdong-Hong Kong-Macao Greater Bay Area has made great contribution to supporting China's total foreign trade, which can be said to be an important part of the development of China's economic external circulation.

Secondly, there is a division of labor on the east and west banks of the Pearl River, with obvious regional differences. The total foreign trade of cities on the east bank of the Pearl River is larger, while the total import and export of cities on the west bank is smaller. Although the West Bank has been stronger than the East Bank before modern times, Foshan and other places have strong traditional cultural heritage, and pay attention to education, in general, they are stronger than the East Bank in terms of humanistic quality. And the government has actively promoted and paid attention to the construction of the advanced equipment manufacturing industrial belt in the West Bank of the Pearl River and achieved substantial achievements. But the eastern Pearl River has been in the lead since Hong Kong opened its ports. Good port is a very important reason, deep water port suitable for large ships docking, so that the external traffic is convenient,

conducive to the transport of a large number of goods, and then better integration into the world trading system. Moreover, the east bank of the Pearl River also has the talent advantage, such as Hong Kong, Shenzhen, Dongguan and other cities have attracted a large number of high-quality talent resources from all over the country, and formed the electronic information industry cluster.

2) The commodity structure is concentrated, and the market structure is “East in and West out”

The commodity structure of import and export is concentrated on electro-mechanical products. Since the customs statistics of some cities do not publish the relevant data of the main countries of import and export of foreign trade, in order to facilitate the analysis, the analysis is based on the total value table of key import and export commodities (people's currency value) of Guangdong Province in 2019 published by the Guangdong Branch of the General Administration of Customs of the People's Republic of China. In 2019, Guangdong Province mainly imported mechanical and electrical products, electronic components and integrated circuits. The import amount was RMB 1.91 trillion, RMB 1.00 trillion and RMB 0.83 trillion respectively, of which mechanical and electrical products accounted for 67.97% of the total import value (RMB 2.81 trillion), nearly 70%. In 2019, Guangdong Province exported key commodities, such as mainly organic and labor-intensive products, with an export amount of 2 trillion yuan and 0.77 trillion yuan respectively, of which mechanical and electrical products still accounted for 67.97% of the total export value (4.34 trillion yuan), also close to 70%. It can be seen that the key foreign import and export commodities of Guangdong Province in 2019 are mainly concentrated in mechanical and electrical products.

The market structure flow direction of foreign import and export is mainly “East in and West out”. According to the foreign trade import and export data released by the Guangdong Branch of the General Administration of Customs of the People's Republic of China, according to the value of trade volume, the main countries of foreign import and export of Guangdong Province in 2019 are Hong Kong, Chinese Mainland, ASEAN and the European Union. If Hong Kong, China is excluded, the top three are ASEAN, the European Union and the United States. In terms of import, Guangdong Province mainly imports goods from ASEAN, Taiwan (China) and the EU, and the trade volume of goods imported from ASEAN has reached 0.53 trillion yuan, accounting for 18.86% of the total import volume. In terms of exports, Guangdong Province mainly exports goods to Hong Kong, Chinese Mainland, the United States and the European Union. Excluding Hong Kong, the top three are the United States, the European Union and ASEAN, and the trade volume of goods exported to the United States has reached 0.70 trillion yuan, accounting for 16.13% of the total export volume. It can be seen that the main flow direction of import and export trade of Guangdong Province in 2019 is “going from east to west”.

3) The proportion of GDP is relatively large, and the overall surplus is

presented

First, the foreign trade volume of each city presents a echelon, accounting for a large proportion of GDP. By observing the total import and export volume of each region in 2019 (**Figure 1**), we can see that these 11 cities have formed three tiers. The Hong Kong Special Administrative Region and Shenzhen have the highest total import and export volume and are relatively open to the outside world. Dongguan and Guangzhou are located in the second tier, the manufacturing industry is relatively developed, and foreign trade is also relatively close. Once again, location advantages such as geographical environment and infrastructure are not particularly evident compared to the first two echelons (Fu & Zhang, 2020).

Except for the foreign trade deficits of Hong Kong and Macao, the nine cities in the Pearl River Delta are all in the foreign trade surplus. Of the 11 cities in the Guangdong-Hong Kong-Macao Greater Bay Area, Hong Kong and Macao are the trade deficits, and the nine other cities in the Pearl River Delta are all with total exports exceeding total imports, creating a trade surplus. Moreover, the surplus balance of some cities is relatively large, which is conducive to increasing the inflow of foreign funds, promoting economic development, and boosting the income of workers. The foreign economies of Hong Kong and Macao are relatively developed. However, because Hong Kong is a tax-free port, and Macao is also an international free port, the import volume is relatively large, and the land area is relatively small, so the two cities have relatively few exports and are in the trade deficit.

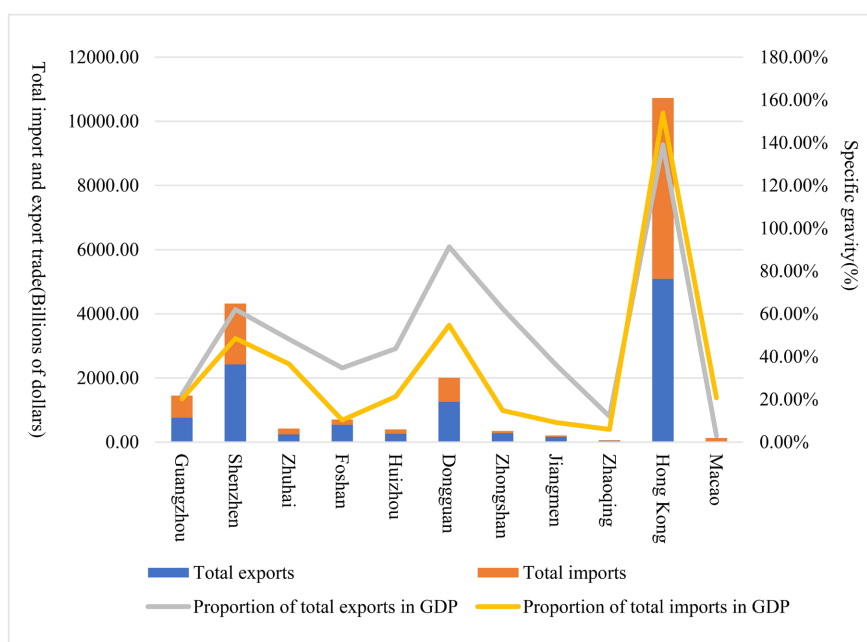


Figure 1. Total import and export volume and proportion to GDP of the Guangdong-Hong Kong-Macao greater bay area in 2019. Data source: Guangdong Statistical Yearbook 2020.

2.1.2. Hong Kong Has a Relatively High Share in the Introduction of Foreign Capital and Foreign Investment

In terms of the introduction of foreign capital, although Hong Kong declined significantly in 2019, its proportion in GDP is still larger than that of the Pearl River Delta and Macao. The actual foreign investment in the Pearl River Delta in 2019 was 145.998 billion yuan¹, accounting for 1.26% of the GDP of the Guangdong-Hong Kong-Macao Greater Bay Area. According to the Statistics Department of the HKSAR government, the inflow of foreign direct investment in the HKSAR fell by 47.12%, from US \$104 billion in 2018 to US \$55 billion in 2019. The inflow of foreign capital accounted for 3.27% of GDP in 2019. Although Macau's two-year growth rate is high; the impact on GDP is still small. According to statistics published on the official website of the Macao Trade and Investment Promotion Bureau, the amount of foreign direct investment flowing into Macao in 2019 was MOP 53.99 billion, a significant increase of 167.8% on an annual basis, accounting for 0.40% of GDP. The main inflow industry is the gambling industry, as many as MOP 43.31 billion. According to the calculation, the proportion of foreign capital introduced by Guangdong, Hong Kong and Macao in the GDP is 4.93%, and the amount of foreign capital introduced by Hong Kong Special Administrative Region has a great impact on the GDP.

In terms of external investment, despite the relatively large decline in 2019, Hong Kong's share of GDP is still larger than that of the Pearl River Delta and Macao. In 2019, the real foreign investment of Guangdong Province declined a lot, but it accounted for a small proportion of GDP. According to the statistics on foreign investment cooperation of Guangdong Province released by the Department of Commerce of Guangdong Province, the real investment amount of China added by non-financial foreign direct investment of Guangdong Province in 2019 was 10.277 billion US dollars, down 25.53% year-on-year, accounting for 0.61% of GDP, less than one%. Hong Kong's foreign direct investment decreased by 40% in 2019, accounting for a large proportion of GDP and having a great impact. According to the relevant data of the world data atlas², the outward direct investment outflow of the Hong Kong Special Administrative Region decreased from US \$126 billion in 2018 to US \$75.5 billion in 2019, a decrease of 40%, accounting for 4.50% of GDP. Macao's actual foreign investment rose sharply in 2019, but the total amount is still small, accounting for a particularly small proportion of GDP. According to the statistics released on the official website of the Macao Trade and Investment Promotion Bureau³, the overseas direct investment of the Macao Special Administrative Region in 2019 was MOP 4.53 billion, a year-on-year increase of 292.8%, accounting for 0.03% of GDP. According to the calculation, the proportion of foreign investment in the Guangdong-Hong Kong-Macao Greater Bay Area in GDP is about 5.14%. Compared with the amount of foreign investment, it contributes slightly to GDP, and the

¹In this paper, the average exchange rate of 2019 is used for all conversions.

²<https://cn.knoema.com/atlas>

³<https://www.ipim.gov.mo/zh-hans/business-investment/macaos-principles-statistical-indicators/>

proportion of Hong Kong Special Administrative Region is relatively large. (Figure 2)

2.1.3. Convenient Transportation for Smooth Internal and External Circulation Supply Chain

The Guangdong-Hong Kong-Macao Greater Bay Area port transport base is good, is the communication of internal and external circulation of the important transport hub. According to the data released by the Ministry of transport of China, Guangdong Province had the largest cargo throughput of coastal ports in 2019, with a cargo throughput of 1.679 billion tons. Among them, Guangzhou, Shenzhen, Zhanjiang and Dongguan contributed the most. According to China Statistical Yearbook 2020, the container throughput of Hong Kong port in 2019 totaled 18.303 million standard containers. Although the cargo throughput of Hong Kong port cannot be obtained, compared with the 22.83 million standard containers of Guangzhou port, the cargo throughput of Hong Kong port should be similar to that of Guangzhou port, and it is also a port with strong operation capacity. As can be seen from Figure 3, nearly 90% of the cargo throughput in Guangdong Province is the throughput of coastal ports, of which Guangzhou port accounts for 45%. The level of port transportation in the Guangdong-Hong Kong-Macao Greater Bay Area is high, and port group integration and mutual cooperation among ports are also carried out (Wang et al., 2020a). Moreover, the port and the hinterland also maintain mutual contact, which has a strong attraction to the hinterland (Deng et al., 2022).

The Guangdong-Hong Kong-Macao Greater Bay Area can vigorously build e-commerce industry, which is inseparable from the high-level development quality of logistics industry. In the process of improving transportation infrastructure such as high-speed rail, Dongguan, Shenzhen and Hong Kong have become the transportation centers of the Guangdong-Hong Kong-Macao Greater Bay Area (Luo et al., 2020). The continuous improvement of traffic accessibility provides conditions and possibilities for reducing the cost of logistics and transportation industry. According to the analysis report released by Guangdong Logistics Industry Association, in 2019, China's logistics demand grew steadily, the growth of logistics cost slowed down, and the logistics efficiency was higher. Generally speaking, China's logistics level was improved. It is more conducive to the efficient transmission of domestic means of production and resources, accelerate the structural optimization of logistics goods, improve the growth rate of import and export, and promote the stability of internal and external circulation supply chain. Moreover, Guangdong Province is a logistics province with the largest logistics scale in China (Xiao, 2020). The agglomeration function of Hong Kong Zhuhai Macao Bridge is much stronger than the distribution function. Some transportation hub cities are also very important to accelerate the transfer of logistics, commerce and information flow (Lin et al., 2020), which further strengthens the promoting role of the Guangdong-Hong Kong-Macao Greater Bay Area in the development of a new development pattern of dual circulation.

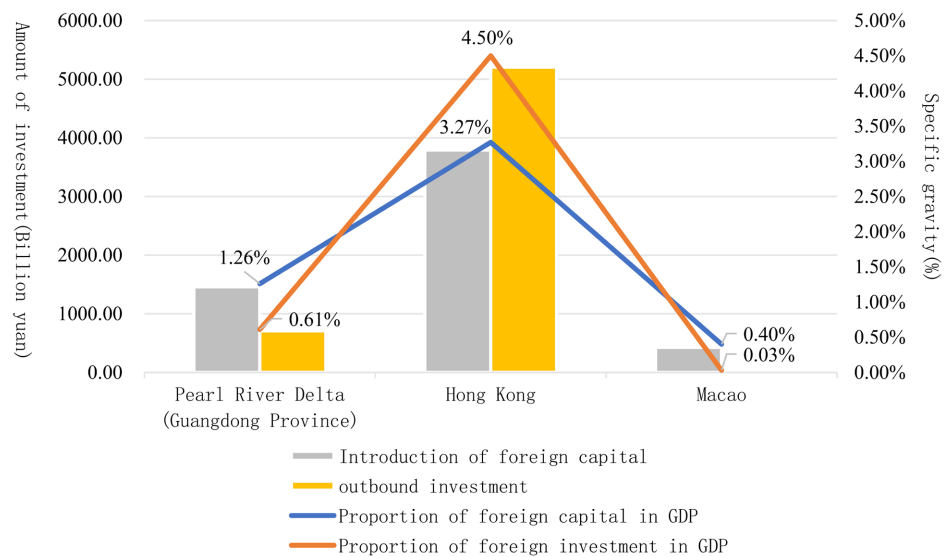


Figure 2. Proportion of foreign investment to GDP. Data source: Guangdong Statistical Yearbook 2020, Statistics Department of the Hong Kong Special Administrative Region Government, Macao Trade and Investment Promotion Bureau official website.

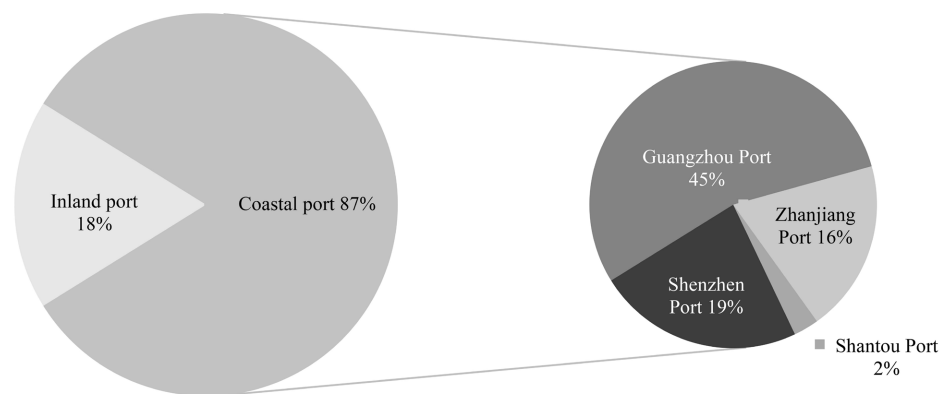


Figure 3. Proportion of cargo throughput of ports in Guangdong province to total throughput. Data source: Guangdong Statistical Yearbook 2020.

2.2. Current Situation of Internal Circulation Development

The internal circulation mainly includes investment and consumption activities within the region. Therefore, this paper takes the data of mutual investment, domestic retail sales, income and consumption of urban and rural residents in the Guangdong-Hong Kong-Macao Greater Bay Area as the factual basis, and takes the mutual economic and trade relations between Hong Kong, Macao, the mainland and Guangdong Province as the main line of analysis, in order to show a clear and real development situation.

2.2.1. Mutual Investment between Guangdong Province and Hong Kong and Macao Has Risen Rapidly and Cooperation Is Close

From 2016 to 2019, Hong Kong's direct investment in Chinese mainland increased steadily. According to the Statistics Department of the HKSAR govern-

ment, Hong Kong's direct investment outflow to Chinese mainland in 2019 was HK \$0.41 trillion, accounting for 3.12% of GDP, and has increased steadily in recent years. From 2016 to the end of 2019, Hong Kong's direct investment position in Chinese mainland was HK \$4.82 trillion, HK \$5.42 trillion, HK \$5.82 trillion and HK \$6.28 trillion respectively, with continuous and stable growth. In her 2018 policy address, the chief executive of the Hong Kong Special Administrative Region, Carrie Lam, mentioned that in strengthening cooperation with the mainland, Hong Kong and the mainland have built many cooperation platforms, which is more conducive to expanding the scope of cooperation, such as innovation and technology, creative industries and other fields. The signing of CEPA⁴ has built a good bridge for mutual investment in commodity and service markets, which is conducive to strengthening the links between Hong Kong and the mainland and promoting integrated development (Chan, 2020). In addition, a greater proportion of Hong Kong's investment in the mainland flows to Guangdong Province, so Hong Kong's direct investment in Guangdong Province has increased very rapidly. Hong Kong's investment in Guangdong Province grew rapidly in 2018 and remained rising in 2019. Due to the lack of specific data and the small economic aggregate of other cities in Guangdong Province except the nine cities in the Pearl River Delta, taking Guangdong Province as the Pearl River Delta, we can see that the mutual direct investment between Guangdong Province and Hong Kong has increased very rapidly since 2018, especially the direct investment of Hong Kong enterprises in Guangdong Province, which was nearly six times that of 2017.

The target countries and regions of Macao's foreign investment in 2019 are mainly Chinese mainland and Hong Kong, and Guangdong Province accounts for as much as 60%. The construction of the Guangdong-Hong Kong-Macao Greater Bay Area occupies an important position in the main activities of the promulgation and implementation of the Guangdong Macao cooperation framework agreement in July 2018, laying a foundation for mutual investment and cooperation between Guangdong and Macao. According to the new regulations in 2019, Macao's investment in the mainland of the Guangdong Macao cooperation and development fund established in June 2018 can be exempted from income tax, which is conducive to reducing the tax cost of Macao's investment in the mainland and greatly promoting Macao's direct investment in the mainland. According to the statistics released on the official website of Macao Trade and Investment Promotion Bureau, by the end of 2019, the cumulative total amount of Macao's overseas direct investment was MOP 55.49 billion, an increase of 9.4% year-on-year. From Figure 4, it can be seen that a large proportion of investment was in Chinese mainland, MOP 45.55 billion, mainly concentrated in Guangdong Province, with MOP 33.47 billion, accounting for 60% of the cumulative total; In Hong Kong, there are MOP 10.56 billion, accounting for 19%. It can be seen that Macao mainly invests in China, especially in Guangdong Province and Hong

⁴Arrangements between the Mainland and Hong Kong for closer economic and trade relations.

Kong Special Administrative Region. At the same time, from the mutual direct investment between Guangdong Province and Macao (**Table 1**), it can be seen that the amount of mutual direct investment between Guangdong Province and Macao also increased rapidly in 2018 and 2019. The economic ties between Guangdong Province and Hong Kong and Macao are becoming closer and closer.

2.2.2. Domestic Retail Volume in the Pearl River Delta Is Higher Than That in Hong Kong and Macao, with Strong Synergy and Innovation

Domestic retail sales in the Pearl River Delta were higher in 2019, while those in Hong Kong and Macao were lower. The total retail sales of social consumer goods in the Pearl River Delta in 2019 was 3.32 trillion yuan, accounting for 28.70% of the GDP of the Great Bay area of Guangdong, Hong Kong and Macao, nearly 30%. According to the data released by the Statistics Department of the government of the Hong Kong Special Administrative Region, the retail sales of the Hong Kong Special Administrative Region in 2019 was HK \$0.43 trillion, accounting for 3.28% of GDP. According to the statistics released on the official website of Macao Trade and Investment Promotion Bureau, the total added value of Macao's wholesale and retail industry to the economy in 2019 was mop

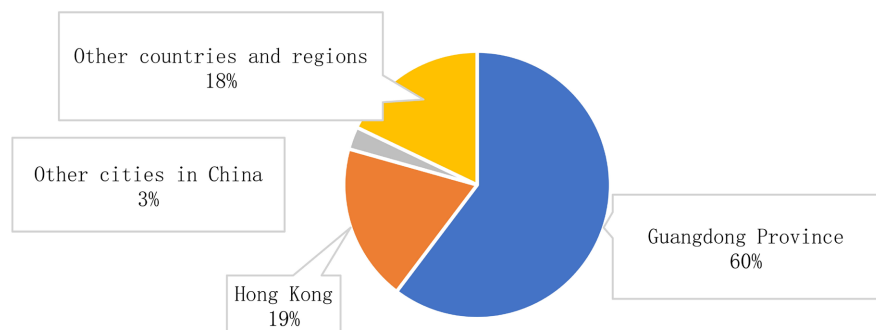


Figure 4. Proportion of overseas direct investment in Macao at the end of 2019 (Unit: %). Data source: Statistics published on the official website of Macao Trade and Investment Promotion Bureau.

Table 1. Direct investment between Guangdong province and Hong Kong and Macao in 2017-2019 (Unit: Ten thousand dollars).

Year	Amount of direct investment in Hong Kong	Foreign direct investment in Hong Kong	Amount of direct investment in Macau	Foreign direct investment in Macau
2017	503,192	1,692,741	131	55,994
2018	870,981	9,951,620	305	785,843
2019	674,883	10,511,307	2851	1,012,012

Data source: Guangdong Statistical Yearbook 2020, Statistics Department of the Hong Kong Special Administrative Region Government, Macao Trade and Investment Promotion Bureau official website data.

24.02 billion, a decrease of 4.3%, accounting for 0.18% of GDP. According to the calculation, the domestic retail sales of the Guangdong-Hong Kong-Macao Greater Bay Area account for 32.39% of GDP, which has a great impact on GDP, especially in the Pearl River Delta. The reason may be that the Pearl River Delta has a large geographical area, developed manufacturing industry and broad hinterland market. Moreover, Hong Kong is adversely affected by the 2019 amendment. From June 2019 to the end of 2019, 97% of retail companies have made profits and losses, and even more than half of them are serious losses.

The Guangdong-Hong Kong-Macao Greater Bay Area has a high degree of regional collaborative innovation, which is conducive to local production cooperation. An outline and two opinions⁵ issued by the Chinese government in 2019 and 2020 both mentioned paying attention to the role of scientific and technological innovation and implementing the innovation driven development strategy (Li & Liu, 2021). Moreover, all localities are also committed to mutual cooperation and collaborative innovation, which is conducive to the sharing and dissemination of advanced knowledge and technology, promote intensive and scientific production, reduce production costs and improve product competitiveness. The government has also promoted policies, such as promoting in-depth cooperation between Guangzhou and Zhanjiang, Shenzhen and Shantou; form a cluster with highly concentrated economic complexity in Hong Kong, Shenzhen and Guangzhou and their surrounding cities (Lee & Lin, 2020); strengthen the docking cooperation between Guangzhou, Shenzhen and Zhuhai free trade zones and innovation cooperation zones. This is conducive to collaborative innovation, more efficient breakthroughs in new science and technology, and rational use and distribution of resources.

2.2.3. There Is a Gap between Urban and Rural Incomes, and There Is a Great Potential for Consumption Growth

The income Gini coefficient of Guangdong Province is currently in a reasonable range, but close to the warning line. At present, it is difficult to directly calculate the Gini coefficient of urban and rural integration because the income data of urban and rural residents are listed separately under the people's life in the national statistical yearbook. Therefore, we can use the scholar's research achievement-the simple calculation formula of Gini coefficient on the basis of income quintile to carry on the calculation analysis. The specific formula is Gini coefficient $g = P5 - P1$ ⁶ (Hu, 2004). According to the statistical data in Guangdong statistical yearbook 2020 (Table 2), it can be calculated that $P5$ in 2014-2019 is

⁵The Outline of Development Planning of Guangdong, Hong Kong and Macao Grand Bay Area promulgated in 2019, the Guideline of the CPC Central Committee and State Council on Supporting Shenzhen to Build a Demonstration Zone of Socialism with Chinese Characteristics, and the Guideline of the CPC Central Committee and State Council on Constructing a More Perfect System of Factor Marketization Allocation in 2020.

⁶ $P5$ is the proportion of the income of the residents with the highest income of 20% to the income of all the residents, and $P1$ is the proportion of the income of the residents with the lowest income of 20% to the income of all the residents.

Table 2. 2014-2019 Disposable income per capita of residents in Guangdong province by five equal income groups in 2014-2019 (Unit: yuan).

Year	Low-income households (20%)	Moderately lower households (20%)	Middle-income households (20%)	Moderate upper-level households (20%)	High income account (20%)	Sum
2014	8217.51	15943.33	24262.68	34567.56	61108.41	144099.49
2015	9061.46	17872.97	27320.78	37925.00	63045.38	155225.59
2016	9544.65	19574.65	30598.48	41989.63	68599.33	170306.74
2017	10534.31	20963.27	32339.36	45235.77	75774.57	184847.27
2018	11241.71	21673.77	33984.26	49984.23	82444.32	199328.29
2019	11824.33	23226.18	36697.84	54261.18	89717.48	215727.00

Data source: Guangdong Statistical Yearbook 2020.

equal to 0.42, 0.41, 0.40, 0.41, 0.41 and 0.42 respectively, and P1 is equal to 0.057, 0.058, 0.056, 0.057, 0.056 and 0.055 respectively. Therefore, the Gini coefficient from 2014 to 2019 is approximately equal to $g = 0.363, 0.352, 0.344, 0.353, 0.354$ and 0.365. It can be seen that the income Gini coefficient of Guangdong province fluctuates between 0.34 and 0.37 in the six years from 2014 to 2019. The lower the Gini coefficient, the more average the income distribution, and vice versa. In international practice and the provisions of relevant UN organizations, 0.3 - 0.39 is considered to be relatively reasonable in income, while 0.4 - 0.59 indicates a relatively large income gap. At present, the Gini coefficient level in Guangdong Province is very close to the warning line of 0.4.

The per capita disposable income and per capita consumption of rural residents are lower than those of urban residents, and the growth rate is also low. According to the data released by Guangdong Provincial Bureau of Statistics (Table 3), the per capita disposable income of Guangdong Province continued to grow steadily from 2013 to 2019. In 2019, the per capita disposable income of residents in Guangdong Province was about 39,000 yuan, with an actual growth rate of 5.3%. The per capita disposable income of urban residents was about 48,100 yuan, with a real growth rate of 5.2%; the per capita disposable income of rural residents was about 18,800 yuan, with a real growth rate of 4.8%. Therefore, the per capita disposable income of rural residents is less than half that of urban residents and the real growth rate is also slightly lower. However, the growth rate of per capita consumption expenditure of urban and rural residents is higher than that of per capita disposable income, which shows that the consumption desire of residents is higher than the consumption level, and the potential of domestic demand needs to be explored. The per capita consumption expenditure of Guangdong Province is also rising from 2013 to 2019. In 2019, the per capita consumption expenditure of residents in Guangdong Province was about 29,000 yuan, a year-on-year increase of 7.6%. The per capita living consumption expenditure of urban residents was about 34,400 yuan, an increase

of 8.0%; the per capita living consumption expenditure of rural residents was about 16,900 yuan, an increase of 5.2%. The per capita consumption of rural residents is also less than half of that of urban residents. It can be seen that the ratio of consumption to income of urban residents is low, which is 71.54%. The ratio of consumption to income of rural residents is higher, 90.07%. Although the amount of consumption and income is low, they are on the rise. From these two aspects, the consumption potential of urban and rural residents in Guangdong is still large in the future, and domestic demand has not been fully explored (Shi & Zhou, 2021).

Table 3. Disposable income and life consumption expenditure of Guangdong province (2013-2019).

Year	Disposable income per capita (yuan)	Nominal growth 100 last year	Real growth 100 last year	Per capita consumption expenditure (yuan)	Nominal growth 100 last year	Real growth 100 last year	Engel coefficient (%)
Residents of the province							
2013	23420.75	110.1	107.4	17421.00	108.9	106.2	35.0
2014	25684.96	109.7	107.2	19205.50	110.2	107.7	34.3
2015	27858.86	108.5	106.9	20975.70	109.2	107.6	34.5
2016	30295.80	108.7	106.3	23448.42	111.8	109.3	34.2
2017	33003.29	108.9	107.3	24819.63	105.8	104.2	33.5
2018	35809.90	108.5	106.2	26053.98	105.0	102.7	32.6
2019	39014.28	108.9	105.3	28994.71	111.3	107.6	32.3
Urban residents							
2013	29537.29	109.5	106.9	21621.46	107.8	105.3	33.6
2014	32148.11	108.8	106.4	23611.74	109.2	106.7	33.2
2015	34757.16	108.1	106.4	25673.08	108.7	107.0	33.2
2016	37684.25	108.4	105.9	28613.33	111.5	108.8	32.9
2017	40975.14	108.7	106.9	30197.91	105.5	103.7	32.2
2018	44340.97	108.2	105.9	30924.31	102.4	100.2	31.6
2019	48117.55	108.5	105.2	34424.12	111.3	108.0	31.2
Rural residents							
2013	11067.79	110.7	107.8	8937.76	111.9	109.0	42.1
2014	12245.56	110.6	108.3	10043.21	112.4	110.1	39.5
2015	13360.44	109.1	107.7	11103.03	110.6	109.2	40.6
2016	14512.15	108.6	106.5	12414.84	111.8	109.6	40.4
2017	15779.74	108.7	107.8	13199.62	106.3	105.5	40.2
2018	17167.74	108.8	106.8	15411.31	116.8	114.6	36.6
2019	18818.42	109.6	104.8	16949.43	110.0	105.2	37.1

Data source: Survey on income and expenditure and living conditions of urban and rural integrated households since 2013.

It can be seen from **Table 4** that among the four groups of data adopted, except for the large standard deviation of per capita disposable income of urban and rural residents, the standard deviation of the other three groups of data is not very large, indicating that the degree of dispersion is not high. Moreover, there are seven observations and a large number, indicating that the data used are reliable.

The results of regression analysis show that the potential of rural domestic demand is greater. According to **Table 5** and **Table 6**, the per capita disposable income (yuan) is taken as the independent variable and the per capita consumption expenditure (yuan) is taken as the dependent variable for linear regression analysis. The results show that the model formula of urban residents' income and expenditure is as follows:

Table 4. Descriptive statistics of main variables.

	mean	SD	min	max	number of observations
Per capita disposable income of urban residents (yuan)	38222.92	6677.75	29537.29	48117.55	7
Per capita consumption expenditure of urban residents (yuan)	27866.56	4476.985	21621.46	34424.12	7
Per capita disposable income of rural residents (yuan)	14707.41	2746.619	11067.79	18818.42	7
Per capita consumption expenditure of rural residents (yuan)	12579.89	2869.439	8937.76	16949.43	7

Data source: Survey on income and expenditure and living conditions of urban and rural integrated households since 2013.

Table 5. Linear regression analysis results of per capita disposable income and per capita consumption expenditure of urban residents (N = 7).

	Non-normalized coefficient		Normalization coefficient	<i>p</i>	VIF	<i>R</i> ²	Adjust <i>R</i> ² value	<i>F</i>
	<i>B</i>	Standard error	Beta					
Constant	2537.654	1762.381	-	0.209	-			<i>F</i> (1, 5) = 211.958, <i>p</i> = 0.000
Disposable income per capita (yuan)	0.663	0.046	0.988	0.000**	1	0.977	0.972	

Dependent variable: Per capita consumption expenditure (yuan). D-W Value: 1.729. **p* < 0.05 ***p* < 0.01. Data source: Survey on income and expenditure and living conditions of urban and rural integrated households since 2013.

Table 6. Linear regression analysis results of per capita disposable income and per capita consumption expenditure of rural residents (N = 7).

	Non-normalized coefficient		Normalization coefficient	<i>p</i>	VIF	<i>R</i> ²	Adjust <i>R</i> ² value	<i>F</i>
	<i>B</i>	Standard error	Beta					
Constant	-2729.581	592.742	-	0.006**	-			<i>F</i> (1, 5) = 687.038, <i>p</i> = 0.000
Disposable income per capita (yuan)	1.041	0.04	0.996	0.000**	1	0.993	0.991	

Dependent variable: Per capita consumption expenditure (yuan). D-W Value: 2.644. **p* < 0.05 ***p* < 0.01. Data source: Survey on income and expenditure and living conditions of urban and rural integrated households since 2013.

$$\begin{aligned} & \text{per capita consumption expenditure (yuan)} \\ & = 2537.654 + 0.663 * \text{per capita disposable income (yuan)} \end{aligned} \quad (1)$$

Similarly, the model formula of income and expenditure of rural residents is:

$$\begin{aligned} & \text{per capita consumption expenditure (yuan)} \\ & = -2729.581 + 1.041 * \text{per capita disposable income (yuan)} \end{aligned} \quad (2)$$

The *R*-square values of the urban-rural model are 0.977 and 0.993 respectively, indicating that the per capita disposable income (yuan) can explain 97.7% and 99.3% of the per capita consumption expenditure (yuan) respectively. Both models passed the F-test (Urban $F = 211.958$ and rural $F = 687.038$, $p = 0.000 < 0.05$), which means that the per capita disposable income (yuan) must have an impact on the per capita consumption expenditure (yuan). The specific analysis shows that the regression coefficient value of the per capita disposable income (yuan) of urban residents is 0.663 ($p = 0.000 < 0.01$), The regression coefficient of per capita disposable income (yuan) of rural residents is 1.041 ($p = 0.000 < 0.01$). According to the summary and analysis, the per capita disposable income (yuan) of urban and rural residents will have a significant positive impact on the per capita consumption expenditure (yuan). It means that the per capita consumption of rural residents has a greater positive impact on the per capita income.

Urbanization brings environmental problems, which needs attention. Moreover, the bigger Engel's coefficient is, the poorer it is to live. By comparing the Engel's coefficient of urban and rural areas, it can be seen that although the urban and rural areas are in the rich stage of 30% - 40%, the Engel's coefficient of rural areas is still close to 40%, which is in the boundary between the well-off and the rich, and has the tendency of being inclined to the rich stage. Therefore, if the overall rural income can be raised to a certain extent, so that the consumption desire of rural residents into consumption capacity, then the consumption of the whole province has been raised, invisible development potential increased. In order to promote the co-development of urban and rural areas, the government will often adopt the way of urbanization to improve the living standard of the rural residents. Unreasonable land use will not only reduce the efficiency of land use, but also affect the ecological environment, reduce the vegetation coverage and water bodies, causing more environmental degradation. For example, the urbanization of coastal cities in the Great Bay Area brings a series of problems to the use of coastal land.

Hong Kong's private consumption will decrease in 2019 and 2020, and government consumption will increase significantly. However, private consumption accounts for a large proportion of GDP. According to the Statistics Department of the government of the Hong Kong Special Administrative Region, Hong Kong's GDP in 2019 and 2020 were HK \$2.84 trillion and HK \$2.67 trillion respectively, a year-on-year decrease of 1.7% and 6.1% respectively. Private con-

sumption expenditure was HK \$1.97 trillion and HK \$1.78 trillion respectively, a year-on-year decrease of 0.8% and 9.9% respectively, accounting for 69.38% and 66.54% of GDP. Government consumption expenditure in 2019 and 2020 was HK \$0.31 trillion and HK \$0.33 trillion respectively, with an annual increase of 5.1% and 8.1%, accounting for 10.88% and 12.52% of GDP. The important reason is that the riots caused by the law revision storm in Hong Kong in 2019 and the impact of the COVID-19 in 2020 have reduced the demand for private consumption. In order to maintain the normal operation of the economy and society, the government has supported those industries and enterprises that cannot be sustained and eliminated social panic through fiscal policy and increased government expenditure (**Figure 5**).

Macao's GDP fell a lot in 2020, and the decline in private consumption narrowed. In 2020, Macao's GDP fell significantly, by 56.3% in real terms. This paper believes that the main reason should be attributed to the shutdown caused by the outbreak of COVID-19 at the end of 2019. The decline in domestic demand narrowed, down 6.4% year-on-year, mainly due to the narrowing decline in private consumer spending. In the fourth quarter of 2020, the decline of residents' final consumption expenditure in Macao narrowed to 2.4%. Due to the continuation of local entry control and other measures, residents' final consumption expenditure in other places decreased by 52.8% and overall private consumption decreased by 10.2% year-on-year. The most direct reason is that the COVID-19 has led to an economic downturn, which has reduced private consumption demand.

3. Problems in the Dual Circulation Development of the Guangdong-Hong Kong-Macao Greater Bay Area

Based on the above analysis of the present situation, we can analyze that there are still some problems in the development of the Guangdong-Hong Kong-Macao Greater Bay Area, and then this paper from the external circulation and internal circulation to further summarize the existing problems.

3.1. Layers of External Circulation

On the external circulation level, the main problems in the development of the Guangdong-Hong Kong-Macao Greater Bay Area are the import and export direction and commodity types, supply chain and value chain, as well as the risk of foreign investment and foreign investment.

3.1.1. The Import and Export Directions Are Relatively Single, and the Commodity Categories Are Relatively Concentrated

On the whole, the import and export trade of the Guangdong-Hong Kong-Macao Greater Bay Area presents the trade pattern of "East in and West out". Guangdong, Hong Kong and Macao are mainly imported from eastern countries, especially from East Asia and Southeast Asia, and East Asia is the main source of foreign trade deficit. Exports mainly to western countries, especially the United

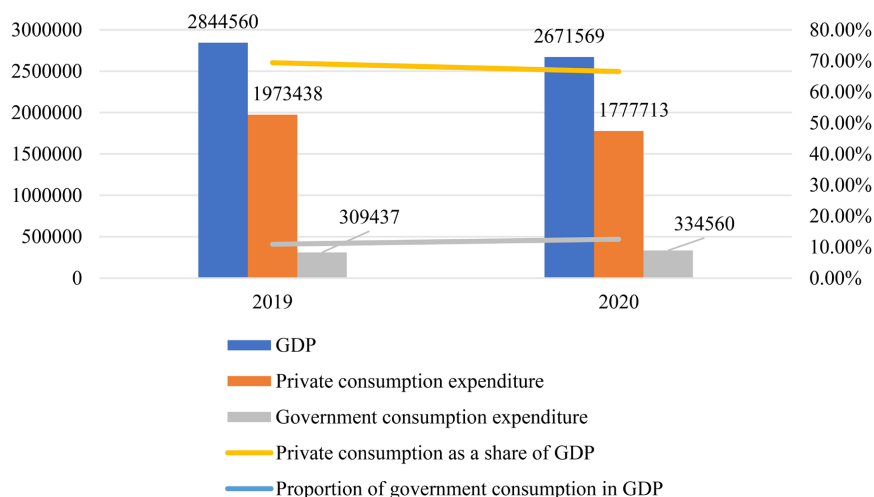


Figure 5. Hong Kong GDP And Consumption Expenditure In 2019-2020(Unit: HK \$million). Source: Data on the official website of the Census and Statistics Department.

States. For example, mechanical and electrical products, the concentration of the target countries is high, mainly in the West, especially in the United States. Because the export market is too concentrated in the United States, trade dependence is large, and is easy to be affected by trade friction between China and the United States, impairing the independence of foreign trade and economic security (Fu & Zhang, 2020). The import and export commodities are concentrated in mechanical and electrical products. In 2019, Guangdong Province imported key commodities, such as mainly organic products, electronic components and integrated circuits, and exported key commodities, such as mainly organic products and labor-intensive products, which accounted for nearly 70% of the total value of imports and exports. Hong Kong and Macao import and export commodities are concentrated in electrical and electronic equipment. The categories of import and export commodities in Hong Kong and Macao are relatively concentrated. In 2017, electrical and electronic equipment accounted for more than 40%, followed by gemstones and precious metal products, whose import and export accounted for about 70%, and the concentration is still increasing.

3.1.2. The Supply Chain Is Not Perfect and the Division of Labor in the Global Value Chain Is Not High

The advantages of the supply side still remain in labor-intensive products, and the scientific and technological content is insufficient. Through the data analysis of the foreign trade of goods in the Guangdong-Hong Kong-Macao Greater Bay Area, relevant scholars pointed out that although the textiles and clothing commodities in the Guangdong-Hong Kong-Macao Greater Bay Area have always been highly competitive in the world, due to the high level of productivity, the market has been gradually saturated, and the foreign import and export volume has reached the highest point (Fu & Zhang, 2020). It can be seen that the technical level of export products in the Guangdong-Hong Kong-Macao Greater Bay

Area is still relatively low. At present, the main foreign competitive advantage is still concentrated in labor-intensive products. Due to the reduction of labor force and the rise of price, the demographic dividend is decreasing. Coupled with market saturation, the production and export advantage of labor-intensive products is weakening. Moreover, the manufacturing industry is mainly processing trade, the added value of products is relatively low, and the international competitiveness is not strong enough. Therefore, there are some problems in the supply side structure of the Guangdong-Hong Kong-Macao Greater Bay Area, such as being in the middle and lower reaches of participating in the division of labor in the global value chain, the competitive advantage of high-tech products is not obvious, and the supply chain is not perfect.

3.1.3. Foreign Investment and Introduction of Foreign Capital Are Risky, and the Confidence of Investors Is Insufficient

Due to insufficient legal protection and some social and political factors in the world economic development affected by epidemic, the foreign and domestic investors in the Guangdong-Hong Kong-Macao Greater Bay Area still face high risks. Although the Guangdong-Hong Kong-Macao Greater Bay Area has a high degree of opening up to the outside world, however, there are some urgent problems to be solved in the process of opening up to the outside world. The first is the lack of real rule of law support. This makes it difficult for the enterprises investing abroad to effectively protect their own legal interests, and then lead to a decrease in enthusiasm, reducing the economic flow. Second, influenced by the current epidemic, the world economic development fluctuates greatly and is very unstable. Premier Li Keqiang also pointed out in the 2020 “Government Work Report” that the impact of the global epidemic impact, the world economy is in a severe recession, many modes of transport stagnant, trade transport costs increase, and international trade investment shrinks. Once again, since June 2019, Hong Kong has experienced a wave of revision, which has caused social unrest and people’s livelihood in Hong Kong, seriously hit Hong Kong’s economy, increased the investment risk of foreign investment, and caused investors to lose confidence. Many foreign investments withdrew from Hong Kong, greatly reducing the amount of foreign investment introduced into Hong Kong. It can be seen that the various uncertainties in the global and domestic markets increase the risk of foreign investment and foreign investment, reduce the investment confidence of investors, and are not conducive to the prosperity of the Gulf region and the world economy.

3.2. Layer of Internal Circulation

At the level of internal circulation, the main problems in the development of the Guangdong-Hong Kong-Macao Greater Bay Area are the difference of internal development, the imperfection of industrial chain, environmental problems and business environment, and the docking of legal system.

3.2.1. Differences in Internal Regional Development, Affecting Social Stability

The gap between urban and regional development is large, affecting common development. Although the total amount of import and export and the total amount of economy in the Guangdong-Hong Kong-Macao Greater Bay Area are large, there is a clear gap between cities and regions. Moreover, the gap between the income and consumption level between urban and rural areas is also very large. As can be seen from the preceding data analysis, the consumption demand of rural residents is still very large at present, but disposable income limits their ability to meet their own needs, so the potential for expanding domestic demand is still great. Local differences and imbalances in these areas may affect the common development of the entire Bay Area. As a warning, the two Bay areas in the United States have increased the development gap between the East and west coasts and the central region of the United States. The construction of Tokyo Bay Area in Japan has also widened the gap between Kanto and Kansai in Japan. The increasingly serious imbalance of development level has attracted a lot of social spears and shields (Liu et al., 2020). Therefore, this paper believes that as an emerging Bay area, the Guangdong-Hong Kong-Macao Greater Bay Area needs to take certain measures and policies to prevent and reduce the gap between the rich and the poor and its negative impact in the process of planning and construction.

3.2.2. The Industrial Chain Is Not Perfect and Cannot Form a Complete Supply Chain

Different industrial structure is not conducive to scale and technology exchange. The industrial structure and location advantages of the East Bank and the West Bank of the Guangdong-Hong Kong-Macao Greater Bay Area are different. It is impossible to reduce production costs through large-scale, and promote the scientific and technological progress of the same industry through technical exchange. Specifically, it is embodied in two aspects. First of all, the West Bank of the Greater Bay Area is mainly a technology-intensive industrial belt, where enterprises and the government are committed to building advanced manufacturing clusters, such as emerging e-commerce. The east bank is mainly knowledge-intensive industrial belt, planned to build advanced equipment manufacturing industrial belt. Secondly, according to the division of cities, the advanced manufacturing industry in the nine cities of the Pearl River Delta is developed, and the e-commerce industry has developed rapidly in recent years. Hong Kong and Macao have a good foundation for the development of high-value-added new service industries such as foreign trade, financial services, tourism, etc., and have the advantages of strong innovative R&D capability and dense operation headquarters (Liu et al., 2020). Although each city has its own industrial planning, the synergy level of the new technology industry in the Guangdong-Hong Kong-Macao Greater Bay Area is still at the middle level, the reasonable degree of resource allocation is not high enough, and there is no outstanding advantage

in the integrity of the industrial chain. For example, the phenomenon of “chain breaking” in the upper and lower reaches of the industrial design industry in the Pearl River Delta is still significant, and the development degree of horizontal and vertical extension is insufficient (Cao & Chen, 2021).

3.2.3. Improper Land Use and Logistics Will Damage the Natural Environment

The Guangdong-Hong Kong-Macao Greater Bay Area did not make rational use of resources and manage logistics, resulting in damage to the natural environment. The coastal zone has an irreplaceable strategic position in terms of natural resources and economic benefits, and there are nine coastal cities in the Guangdong-Hong Kong-Macao Greater Bay Area. The resource utilization and development mode of the coastal area needs to be paid high attention. At present, the urbanization development of coastal cities in the Guangdong-Hong Kong-Macao Greater Bay Area has had many adverse effects on the coastline, including the serious artificial coastline in the Guangdong-Hong Kong-Macao Greater Bay Area and the occupation of agricultural land by urban land in the Guangdong-Hong Kong-Macao Greater Bay Area (Shi et al., 2022). Moreover, the main way of urbanization in the Guangdong-Hong Kong-Macao Greater Bay Area is marginal expansion, which not only reduces the area of cultivated land, forest and wetland, but also further reduces the water permeability and reduces the water body (Wang et al., 2020b). Research shows that the higher the urbanization, the more obvious the change of precipitation spatial and temporal distribution, and the easier it is to cause extreme rainfall and urban waterlogging (Wang et al., 2021). With the development of e-commerce, the logistics industry has also been driven. In particular, there is a great demand for logistics in Guangdong Province. Many light industries and manufacturing industries come from various cities in Guangdong Province. Then there are piles of waste packaging, which are not only due to the large number of logistics, but also due to the excessive packaging of some businesses. The refractory plastic materials not only increase the burden of logistics cost, but also cause great pressure on the environment, which is contrary to the development concept of sustainable development.

3.2.4. The Attractiveness of the Business Environment Is Insufficient, and the Internationalization and Legalization Need to Be Improved

At present, the attraction of the business environment in the Guangdong-Hong Kong-Macao Greater Bay Area to enterprises and investors is not strong enough, and it still needs to be optimized in the direction of internationalization and legalization at a higher level. Optimizing the business environment is conducive to forming a good economic cycle system with international and domestic markets, and enhancing the attraction of the Guangdong-Hong Kong-Macao Greater Bay Area to resources and talents (Li, 2021). Although the business environment

reform in the Guangdong-Hong Kong-Macao Greater Bay Area has made great achievements, for example, the government service reform has achieved remarkable results, reducing work links and innovating network work channels, which is conducive to improving the work efficiency of enterprises and saving time and cost; Adjusting the tax standards for innovation and Entrepreneurship of enterprises and individuals and giving appropriate preferential policies are conducive to reducing the tax burden for enterprises to explore new fields and the trial and error cost of innovation and entrepreneurship, and improving their participation ability and enthusiasm. However, there are still some problems in the Guangdong-Hong Kong-Macao Greater Bay Area in terms of data information asymmetry, financing difficulties of small and medium-sized enterprises and high financing costs. The legal guarantee of property rights protection is not perfect, which may directly affect the enthusiasm and confidence of market subjects (Zhang & Cui, 2021). At some institutional and legal levels, there is no more suitable docking mode with international rules, which is not transparent and convenient enough. These problems show that if the Guangdong-Hong Kong-Macao Greater Bay Area wants to create a higher level and more standardized business environment, it also needs to make greater efforts to improve reform measures, deeply explore innovative mechanisms, and strengthen targeted legislation and justice.

3.2.5. There Are Barriers to Legal System Docking, Which Is Not Conducive to Mutual Cooperation

There are not only differences in political and economic management systems, but also great differences in legal systems and legal application among Guangdong, Hong Kong and Macao (Liu et al., 2019). First, the differences in the legal system. The legislative and judicial traditions of the common law system have a far-reaching impact on the legal system of the HKSAR, which is different from the civil law system in other parts of China. Although both Macao SAR and the mainland belong to the civil law system, Macao still remains the influence of the legal system of the former suzerain country, and there are incompatibility and differences with the mainland law in many aspects. Second, the conflicts and differences in the field of law application. For example, the application of laws in the HKSAR pays more attention to inductive reasoning, which is different from the mainland's interpretation of written laws and regulations and the legal technology of direct application (Guo & Lu, 2021). Due to the differences in legal system and application, the actual handling of trade disputes and conflicts will hinder the efficient settlement of disputes and generate unnecessary costs, which is not conducive to long-term cooperation.

4. Research Conclusion and Policy Suggestions

By collecting and integrating relevant data, this paper analyzes the current situation from the points of view of external circulation elements (foreign trade, for-

eign investment, foreign investment) and internal circulation elements (domestic investment, domestic retail, resident income and consumption) in the dual circulation of the Guangdong-Hong Kong-Macao Greater Bay Area. Combined with the detailed analysis results and conclusions of other scholars concentrated in a certain field respectively, some problems existing in external circulation and internal circulation are summarized more comprehensively.

4.1. Study Conclusion

This paper summarizes four conclusions from the current situation, problems and causes of internal and external circulation. Firstly, the participation degree of external circulation is high, but the internal difference is obvious; secondly, the cooperation of internal circulation investment is good, and the potential of internal demand is large; Thirdly, there are some problems in internal and external circulation, which need to be solved and perfected; finally, the causes of the problems are complex, which can be divided into internal and external.

4.1.1. The Participation Degree of External Circulation Is High, But the Internal Difference Is Obvious

From the analysis of the present situation of the Guangdong-Hong Kong-Macao Greater Bay Area, it can be seen that the Guangdong-Hong Kong-Macao Greater Bay Area, as one of the important pioneer areas of dual circulation, has very high participation and strong competitiveness in the external economy, but the internal development is unbalanced. First, in foreign trade. Due to the good location advantages and national policy support of the Guangdong-Hong Kong-Macao Greater Bay Area, the total amount of foreign trade in 2019 is large, the proportion in GDP is also high, and the overall surplus is in favor of economic development. However, the differences between cities and regions are obvious, of which Hong Kong and Shenzhen have the highest total import and export, far more than other cities; the difference between regions is divided by the east and west banks of the Pearl River. The east banks of the Pearl River are superior to the cities in the west. Second, in terms of the introduction of foreign capital and foreign investment. Affected by the amendment, the amount of foreign investment and foreign investment in Hong Kong decreased significantly in 2019, which had a great negative impact on economic development. However, the proportion of the amount in GDP is still much larger than that in the Pearl River Delta and Macao, and the status of international financial center is still relatively stable; the growth rate of Macao's foreign investment and foreign investment in 2019 is very high, but the total amount accounts for a small proportion of GDP. To sum up, in terms of foreign economy, the Guangdong-Hong Kong-Macao Greater Bay Area has a high amount of foreign trade, foreign investment and foreign investment, with good overall growth prospects and high participation, but it also has a high imbalance in internal differences.

4.1.2. The Cooperation of Internal Recycling Investment Is Good, and the Potential of Domestic Demand Is Relatively Large

From the analysis of the present situation of the circular development in the Guangdong-Hong Kong-Macao Greater Bay Area, we can see that the mutual investment and cooperation in the Guangdong-Hong Kong-Macao Greater Bay Area is better, but there is still more room for improvement in demand. First of all, in terms of domestic investment, due to the proximity of the geographical location, the construction of the Guangdong-Hong Kong-Macao Greater Bay Area and the establishment of a friendly cooperation platform between Hong Kong and the Chinese Mainland, Hong Kong and Macao's investment in Guangdong Province has risen greatly in the past two years, which is conducive to the internal capital flow and economic development of the Guangdong-Hong Kong-Macao Greater Bay Area. Secondly, in terms of domestic retail, the domestic retail volume of the Pearl River Delta is relatively high, accounting for nearly 30% of GDP. While Hong Kong and Macao are lower, in which Hong Kong is affected by the revised case, retail operations have been severely hit, 2019 retail sales fell, but apart from the impact of the revised case, and Macao still has the same rising space. In terms of income and consumption, affected by the new crown epidemic, a large-scale and large-scale shutdown of production in the Guangdong-Hong Kong-Macao Greater Bay Area 2020 economy brought a lot of frustration. Among them, the per capita income of Guangdong Province rose year on year and the per capita consumption fell year on year in 2020. The per capita disposable income and per capita consumption of rural residents were lower than those of urban residents, but the growth rate was higher than that of urban residents. In addition, the ratio of consumption to income of rural residents is relatively high, it can be seen that the consumption demand of urban and rural residents in Guangdong Province still has great potential. Private consumption in both Hong Kong and Macao fell in 2020, and the government of Hong Kong has increased government consumption spending in order to restore the vitality of the market economy, and support the normal operation of the economy, but the proportion of private consumption in the gross domestic product is relatively large, and the impact on the economy is stronger. Therefore, more attention needs to be paid to private consumption and domestic demand development.

4.1.3. There Are Some Problems in Internal and External Circulation, Which Need to Be Solved and Perfected

The analysis of the problems existing in the dual circulation in the Guangdong-Hong Kong-Macao Greater Bay Area starts from the perspective of external circulation and internal circulation. The first is the main problem of external circulation. In terms of foreign trade, the import and export direction of the Guangdong-Hong Kong-Macao Greater Bay Area is relatively single, and the types of goods in Hong Kong and Macao are relatively concentrated. It is neces-

sary to expand the scope of trade objects and increase the diversity of goods like the Pearl River Delta, so as to improve the economic independence of the Guangdong-Hong Kong-Macao Greater Bay Area and reduce the risk of industrial chain rupture. Secondly, the Guangdong-Hong Kong-Macao Greater Bay Area is not only imperfect in the supply chain, but also not high in the division of labor in the global value chain. The main advantageous products are labor-intensive products, and it is difficult for high-tech industries and products to form a favorable competitive advantage, which is still serious in the problem of external circulation. Moreover, the risk of foreign investment is relatively high. In the external environment, the global economy is shrinking due to the impact of the epidemic; in terms of internal legal system, enterprises' foreign investment still lacks effective legal support, such as intellectual property protection, which is not conducive to the establishment of the confidence of enterprises in the Guangdong-Hong Kong-Macao Greater Bay Area in foreign investment.

The second is the main problem of internal circulation. In terms of internal development differences, it mainly includes the large gap in regional development, which is subdivided into the differences in import and export and economic aggregate between cities and regions, as well as the differences in income and consumption levels between urban and rural areas. These gaps are not conducive to the comprehensive and all-round development of the Guangdong-Hong Kong-Macao Greater Bay Area; it also includes the differences in the industrial structure between the east and west sides of the Pearl River and the location advantages of cities. These differences are not conducive to the development of centralized and large-scale industries, but are conducive to making good use of complementary advantages. In terms of legal system, there are docking barriers, which is also a common problem with the differences in political and economic systems between Hong Kong, Macao and the mainland, which is not conducive to mutual cooperation and interoperability. The business environment also needs to be optimized. At present, there are still imperfections and imperfections in the system and law, and the guarantee for the introduction of foreign capital and enterprise innovation is not solid enough. In addition, in terms of ecological environment, the urbanization of the Guangdong-Hong Kong-Macao Greater Bay Area will have some adverse effects on the coastal natural environment, such as land, coastline and precipitation. Considering sustainable development and green development, more comprehensive planning is needed.

4.2. Policy Recommendations

Based on the analysis of the present situation, problems and reasons of the dual circulation development in the Guangdong-Hong Kong-Macao Greater Bay Area, this paper further summarizes and puts forward 3-point external cycle suggestions and 5-point internal cycle policy suggestions according to the research conclusions and the research results of many scholars.

4.2.1. External Circulation Level

The policy suggestions at the level of external circulation are mainly from the aspects of trade objects and commodity types, supply side, scientific and technological innovation and legislation perfection.

1) Promote the diversification of trade objects and commodities

Expand the foreign import and export trade market and increase the types of goods in import and export trade. In view of the single direction of import and export and the concentration of commodity types, the Guangdong-Hong Kong-Macao Greater Bay Area can avoid being controlled by other countries through the diversification and decentralization of trade objects. In terms of import and export, we can expand other markets, make good use of the convenience of existing infrastructure such as the land Silk Road, the maritime Silk Road and the Belt and Road, and increase the number and quality of trade partners. We should pay attention to increasing exports to Eastern countries in order to narrow the trade deficit and alleviate the imbalance of “going from east to west”. At the same time, in terms of commodity types, it is also necessary to increase the diversity of commodities to reduce the risk of breakage of the upper and lower supply chains in the Guangdong-Hong Kong-Macao Greater Bay Area, focusing on advantageous industries and supplemented by inferior industries, so as to strive for comprehensive development (Zhou et al., 2021). Developed regions can transfer excess production capacity and industries to less developed regions, drive “later wealth” with “getting rich first”, and strive to achieve a complete industrial chain cycle within the Bay Area (Zhang & Cui, 2021).

2) Promote supply-side structural reform and scientific and technological innovation

Improve the integrity of the supply chain, enhance the innovation confidence of enterprises and reduce the innovation burden. Due to the problem that the supply chain is not perfect enough, in order to gain an advantageous position in the global value chain, the Guangdong-Hong Kong-Macao Greater Bay Area needs to vigorously optimize the industrial chain according to the actual situation, promote the localization of production technology, transfer the industry internally, improve the integrity, security and stability of the supply chain, prevent the rupture of the industrial chain, and achieve the goal of further promoting the structural reform of the supply side (Jin, 2021). Because the division of labor in the global value chain is not high enough, we also need to pay attention to the development of digital economy and the investment of scientific research funds, improve the innovation level and product quality level of enterprises (Shi & Zhou, 2021), strive to develop digital economy, make effective use of innovative elements such as talent, capital, information and technology, and improve scientific and technological innovation ability and international competitiveness (Jiang & Meng, 2021). Intelligent manufacturing, technological innovation, scale agglomeration, market demand, fixed asset investment and other five factors are important power sources for the transformation and upgrading of manufactur-

ing industry in the Guangdong-Hong Kong-Macao Greater Bay Area (Yang et al., 2021). Therefore, it is necessary to promote the stable development of several factors. We can also adjust taxes in due time to ease the profits and losses of emerging industries and enterprises in the development process of innovation and entrepreneurship in the Guangdong-Hong Kong-Macao Greater Bay Area, so as to reduce the innovation and scientific research risks of emerging industries to a certain extent and improve their enthusiasm to invest funds in scientific research.

3) Perfecting Practical Legislation and Urging Investors to Make Reasonable Decisions

To stabilize the social environment and establish a practical and coordinated legal system, at present, the risk of foreign investment is large, and the security and security of relevant laws are low, so the enthusiasm of foreign investment is not high enough. Therefore, the Guangdong-Hong Kong-Macao Greater Bay Area should accurately grasp the current situation of the rights and interests of foreign investment enterprises on the premise that the relevant legal system with high practicability and authority should be targeted, and should also urge enterprises to raise the level of technology, strive for innovation, and strive to make “Chinese standards” become the world trend. On the other hand, the storm of amending laws in Hong Kong also provides an idea. In order to achieve economic development, we must first ensure political stability, adhere to the treatment of zero tolerance in the face of rioters, and resolutely crack down on and eliminate the unstable factors disturbing social order. From the investor’s point of view, since the world economy is weak, the government and enterprises in the Guangdong-Hong Kong-Macao Greater Bay Area can pay more attention to the development of internal circulation and strive to build a smooth and stable dual circulation development pattern. Investors should take a cautious approach to foreign investment, evaluate the available benefits and risks of foreign investment objects, actively introduce foreign investment, investigate the credit situation of foreign investment in advance, and make reasonable decisions.

4.2.2. Internal Circulation Level

The policy suggestions at the level of external circulation are mainly from the aspects of expanding domestic demand, promoting collaboration, coordinating legislation, optimizing business environment and developing green economy.

1) Reduce the internal regional gap and expand domestic demand

Reduce internal development gap, stimulate internal demand of residents to promote internal circulation. The Guangdong-Hong Kong-Macao Greater Bay Area regional development gap is large, this will affect the big bay area common development, so the Guangdong-Hong Kong-Macao Greater Bay Area needs to carry on the concrete analysis according to the specific situation, takes the difference countermeasure, relies on each city to have the advantage. For example, Hong Kong and Macao are highly developed in service industry, and Hong

Kong's world position in finance, international trade and logistics is crucial to the development of the mainland. Hong Kong and Macao also have solid resources, such as many senior intellectuals and universities living and gathering in both places, as well as a complete economic and political system, such as the financial system, legal system, etc. We will also give full play to the driving effect of cities, raise the level of incomes and consumption of low-income groups and farmers through government secondary income and precision poverty alleviation, reduce the gap between rich and poor, promote social equity, continue to expand middle-income groups, and promote high-quality development of the domestic demand market.

2) Promote complementary collaboration and tax adjustments to reduce flow costs

Strengthen the integration and upgrading of industrial cooperation, reduce taxes and promote efficient cooperation among regions. Although the industrial structures of Guangdong, Hong Kong and Macao are different, it means that they can complement each other. Facts have proved that the differences between them can form a complementary situation. Through their respective development of advantageous industries, they can also form linkage development, improve the level of cooperation, reduce costs, and achieve the ideal effect of " $1 + 1 > 2$ " (Jin & Wang, 2021). In promoting regional development, industrial synergy, integration, upgrading and basic development strategies can be adopted for cities with different development conditions (Dou et al., 2021). Through the adjustment of cross-regional production factors, the core factor spillover effect can also be promoted (Han et al., 2021). For example, in order to promote the active flow of talent elements in the Guangdong-Hong Kong-Macao Greater Bay Area, efficiently achieve collaborative production and transaction exchanges, and reduce the tax burden of Hong Kong and Macao talents working and living in the mainland is a reasonable and legal powerful measure. The government should also pay attention to strengthening policy protection for vulnerable industries and sunrise industries, so as to improve the innovation and entrepreneurship enthusiasm of enterprises and develop new markets.

3) Promoting Synergetic Legislation among Regions and Unifying the Implementation of Judicial Acts

All regions coordinate legislation to reduce disputes in legislative and judicial processes. The existence of barriers to legal system will probably lead to conflicts and disputes between regions and cities in legislation and justice. In terms of legislation, we can try to create a legal environment conducive to the cooperative development of enterprises by means of collaborative legislation. In the coordination of disputes, we can make full use of mediation, arbitration and other moderated means to coordinate and resolve the disputes between both parties. In the aspect of judicature, it is necessary to ensure fairness, impartiality and objectivity. When resolving the cases of market subjects both inside and outside China, there may be some differences in practice.

4) Optimize the system and financial market and build the business environment governed by law

Solve institutional and legal problems and create an attractive business environment. In order to create a good business environment, first of all, we need to optimize the system and rules. It is necessary to draw lessons from the rules and regulations of Hong Kong and Macao to create rules and regulations with international standards and highly recognized by the world. This is more conducive to opening up the country and attracting foreign investment. Secondly, strengthen infrastructure construction, give full play to the connecting role of Hong Kong Zhuhai Macao Bridge, improve the logistics and transportation conditions of resources and products, and promote the all-round and healthy economic and social development of Guangdong Province (Li & Zhang, 2021), and optimize the financial market. Further improve the financing environment of small and medium-sized enterprises and solve the long-term problem of financing difficulties of small and medium-sized enterprises. Use a variety of financing means to improve the liquidity and utilization efficiency of capital. At the same time, more consideration needs to be given to the social problems in Guangdong Province and the appropriate degree of public participation in Hong Kong to avoid excessive interference with economic and social development (Li et al., 2018). We should also strengthen the legislative protection and comprehensive protection of property rights and other rights and interests. By improving relevant laws and taking equality as the basic principle, we can ensure that all kinds of property rights can be covered, and promote all market subjects to invest and innovate more confidently (Jiang & Meng, 2021).

5) Develop green economy, optimize environment and promote sustainable development

Green development is still an important coordination factor to promote the transformation of manufacturing and economic development. From the historical facts, the development of urbanization and industrialization will inevitably cause a certain adverse impact on the ecological environment. First of all, Guangdong, Hong Kong and Macao need to plan coastal land development plans and improve land use efficiency and intensification. Limited resources are allocated according to the development characteristics of cities and industries and future development plans. Secondly, we can make more efficient use of various resources by developing green economy and innovating new technologies, deeply implement the development concept of “green water and green mountains are golden mountains and silver mountains,” reduce sewage discharge and increase vegetation coverage to improve the environment, promote ecological environment optimization, and promote sustainable development.

Acknowledgements

The authors disclose receipt of the following financial support for the research, authorship, and/or publication of this article:

We gratefully acknowledge Supported by National Social Science Foundation (No. 21CJL007); Guangzhou Social Science Planning project (No. 2021GZGJ07); Natural Science Foundation of Guangdong Province (Project No. 2020A1515010629); Basic and Applied Basic Research Project of Guangzhou in 2021 (Project No. 202102021185); Project of Guangzhou Research Center for Public Opinion Governance and International Image Communication (Project No. 2021-YB-01).

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Cao, X. Q., & Chen, M. Q. (2021). Construction Strategy of Industrial Design Industry Chain in Pearl River Delta Region. *Science and Technology Management Research*, 41, 98-104.
- Chan, F. (2020). The Guangdong-Hong Kong-Macao Greater Bay Area: Enhancing Collaborative Governance of the CEPA Implementation and Regional Integration. *China: An International Journal*, 18, 171-191.
- Deng, J. H., Xu, C. C., & Zhou, W. L. (2022). The Space-Time Evolutionary Mechanism of Port Group Hinterland under the “Dual Circulation” New Development Pattern—Taking the Port Group of Guangdong-Hong Kong-Macao Greater Bay Area as the Case. *China Business and Market*, 36, 20-32.
- Dou, Z. X., Sun, Y. M., Wang, T., Wan, H. Y., & Fan, S. Q. (2021). Exploring Regional Advanced Manufacturing and Its Driving Factors: A Case Study of the Guangdong-Hong Kong-Macao Greater Bay Area. *International Journal of Environmental Research and Public Health*, 18, 5800. <https://doi.org/10.3390/ijerph18115800>
- Fu, M., & Zhang, Y. (2020). Multidimensional Subdivided Indices and Their Characteristics of Foreign Trade in Guangdong-Hong Kong-Macao Greater Bay Area. *International Economics and Trade Research*, 36, 71-85.
- Guo, T. W., & Lu, S. Y. (2021). Legal Support and Guarantee of the New Development Pattern of “Dual Circulation”—Taking the Construction of the Guangdong-Hong Kong-Macao Greater Bay Area as an Example. *Practice and Theory of SEZs*, No. 1, 22-29.
- Han, Y. H., Mai, J. H., Li, Q., Zhang, F., & Luo, X. F. (2021). Facilitating the Guangdong-Hong Kong-Macao Greater Bay Area’s Participation in the Dual Circulation Economy. *E3S Web of Conferences*, 251, Article No. 03007. <https://doi.org/10.1051/e3sconf/202125103007>
- Hu, Z. G. (2004). A Study of the Best Theoretical Value of Gini Coefficient and Its Concise Calculation Formula. *Economic Research*, No. 9, 60-69.
- Jiang, X. J., & Meng, L. J. (2021). Mainly Inner Circulation, Outer Circulation Empowerment and Higher-Level Dual Circulation: International Experience and Chinese Practice. *Managing the World*, 37, 1-19.
- Jin, K. (2021). *Construction of the Guangdong-Hong Kong-Macao Greater Bay Area under the New Development Pattern of “Dual Circulation” from the Perspective of Supply Chain Security* (p. 188). Shenzhen Special Administrative Region Report (B02).
- Jin, R. S., & Wang, S. B. (2021). International Experience and China’s Path of the Dual

- Circulation Development Pattern. *Gansu Social Sciences*, No. 3, 182.
- Lee, I., & Lin, F. Y. (2020). Economic Complexity of the City Cluster in Guangdong-Hong Kong-Macao Greater Bay Area, China. *Sustainability*, 12, Article No. 5639. <https://doi.org/10.3390/su12145639>
- Li, F. (2021). Dual Circulations of Domestic and International Economy: Theoretical Framework and Chinese Practice. *Journal of Finance and Economics*, 47, 4-18.
- Li, H. Y., Jin, R. Y., Ning, X., Skitmore, M., & Zhang, T. Y. (2018). Prioritizing the Sustainability Objectives of Major Public Projects in the Guangdong-Hong Kong-Macao Greater Bay Area. *Sustainability*, 10, Article No. 4110. <https://doi.org/10.3390/su10114110>
- Li, T. C., & Liu, L. (2021). Research on the Policy System of Guangdong-Hong Kong-Macao Greater Bay Area Collaborative Innovation. *Science and Technology Management Research*, 41, 19-27.
- Li, W. Y., & Zhang, X. Y. (2021). Guangdong-Hong Kong-Macao Greater Bay Area's Construction promotes the Economic Development of Guangdong in the New Era. *E3S Web of Conferences*, 235, Article No. 02014. <https://doi.org/10.1051/e3sconf/202123502014>
- Lin, P. Q., He, Y. T., & Pei, M. Y. (2020). Data-Driven Analysis of Traffic Volume and Hub City Evolution of Cities in the Guangdong-Hong Kong-Macao Greater Bay Area. *IEEE Access*, 8, 12043-12056. <https://doi.org/10.1109/ACCESS.2020.2963852>
- Liu, Y., Wang, Y., & Li, H. (2020). Industrial Development of World-Class Bay Areas and Its Enlightenment to the Guangdong-Hong Kong-Macao Greater Bay Area. *Bulletin of Chinese Academy of Sciences*, 35, 312-321.
- Liu, Y., Wang, Y., Yang, Y., & Ma, L. (2019). Regional Integration and Interaction of the Guangdong-Hong Kong-Macao Greater Bay Area. *Acta Geographica Sinica*, 74, 2455-2466.
- Luo, J. G., Zhang, B., & Liu, S. M. (2020). Spatial Relationship between Traffic Accessibility and Tourism Economic Links in Guangdong-Hong Kong-Macao Greater Bay Area. *Economic Geography*, 40, 213-220.
- Shi, J. J., Li, W. F., Liu, Y. L., Zhou, W. Q., Han, L. J., Tian, S. F., Wang, Y. M., & Niu, X. Q. (2022). Impacts of Urbanization on Coastline and Coastal Zone in the Guangdong-Hong Kong-Macao Greater Bay Area. *Acta Ecologica Sinica*, No. 1, 1-10.
- Shi, Y. L., & Zhou, L. M. (2021). Theoretical Logic, Development Process and Realistic Consideration of "Dual Circulation". *Statistics and Decision Making*, 37, 151-154.
- Wang, Q. F., Zhong, J., & Wang, X. D. (2020a). Model of Port Group Governance in the Guangdong-Hong Kong-Macao Greater Bay Area under the Background of Building an International Shipping Center. *Reform of Economic System*, No. 6, 64-70.
- Wang, X. G., Yan, F. Q., & Su, F. Z. (2020b). Impacts of Urbanization on the Ecosystem Services in the Guangdong-Hong Kong-Macao Greater Bay Area, China. *Remote Sensing*, 12, 3269-3269. <https://doi.org/10.3390/rs12193269>
- Wang, X. H., Cong, P. T., Jin, Y. H., Jia, X. C., Wang, J. S., & Han, Y. X. (2021). Assessing the Effects of Land Cover Land Use Change on Precipitation Dynamics in Guangdong-Hong Kong-Macao Greater Bay Area from 2001 to 2019. *Remote Sensing*, 13, 1135-1135. <https://doi.org/10.3390/rs13061135>
- Xiao, J. H. (2020). Research on the High-Quality Development Path of Logistics Industry in Guangdong-Hong Kong-Macao Greater Bay Area. *China Business and Market*, 34, 66-81.
- Yang, F., Sun, Y. M., Zhang, Y., & Wang, T. (2021). Factors Affecting the Manufacturing

Industry Transformation and Upgrading: A Case Study of Guangdong-Hong Kong-Macao Greater Bay Area. *International Journal of Environmental Research and Public Health*, 18, 7157-7157. <https://doi.org/10.3390/ijerph18137157>

Zhang, X., & Cui, R. M. (2021). A Study of the Strategy for Western China's Involvement in the New "Dual-Circulation" Development Pattern. *Journal of Yunnan Minzu University (Social Sciences)*, 38, 128-135.

Zhou, T. F., Wang, T. S., & Liu, Z. Z. (2021). The Theoretical Logic and Implementation Path of the New Double Cycle Development Pattern. *Academic Research*, No. 5, 85-91.