Bay Area Economic Integration in China

Research on promoting the regional economy integration of

Guangdong-Hong Kong-Macao Greater Bay Area

with the implementation of Belt and Road

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VT/2022	

Abstract

The Guangdong-Hong Kong-Macao Greater Bay Area is a regional economic integration development model that stems from the economic cooperation and exchanges between Hong Kong, Macao, and the Pearl River Delta region over the past 40 years. The construction of the Guangdong-Hong Kong-Macao Greater Bay Area will enable the economic integration and development of this region and promote the construction of the Belt and Road and the expansion of the state's level of openness to the world, driving and radiating the development of other regions.

This thesis aims to provide empirical evidence on whether the integration policy of the Guangdong-Hong Kong-Macao Greater Bay Area can promote regional economic development. This thesis firstly briefly reviews the development history of the Guangdong-Hong Kong-Macao Greater Bay Area and reviews the Chinese and international literature on the background of regional economic integration, the Bay Area economy and economic growth. Secondly, this thesis presents a theoretical review and summary of regional economic integration theory and the centre-periphery model. Again, this thesis tests whether there is an economic growth effect of the policy of establishing the Guangdong-Hong Kong-Macao Greater Bay Area as an integrated region through a Difference-In-Differences method and measures the magnitude of the effect. Finally, based on the findings of the empirical quantitative analysis, a discussion on the continued economic development and integration of the Guangdong-Hong Kong-Macao Greater Bay Area is presented. The thesis concludes that there is an economic growth effect of the policy of GBA integration and that the economic growth rate of the 11 cities in the GBA has increased to a certain extent.

Key Words: Regional Integration, Guangdong-Hong Kong Macao Greater Bay Area, Economic Development, China

Word Count: 10356

Acknowledgement

I give an abundance of gratitude to my supervisor Mirek Dymitrow for his professionalism and patience in the process of writing this thesis. The greatest gratitude goes to my parents for their support in my life and school career. Thank you to my lovely little sister Yinuo, you make me feel the extraordinary beauty of the world. Thank you to my best friend Yujing for nine years of companionship and encouragement, for enlightening my present and future. Finally, thanks to my dear Motherland.

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Chapter 1. Introduction

Economic globalization and regional economic integration have been a common topic for a long time. Any discussion and research on the development of the world economy inevitably take them as the deep background and premise of the discourse. Since the development of human society into the 21st century, the development of economic globalization and regional economic integration has given rise to many new changes in the world economy. Facing the complex and changing world economic situation, all countries face serious development problems. From a global perspective, major economies have taken the initiative to restructure themselves in the post-financial crisis era and are committed to change and breakthroughs. For example, the United States' "Re-industrialization," Japan's "Competitive Manufacturing Strategy," Germany's "Industry 4.0," and India's "Make in India." Different countries have sketched out a strategic blueprint for transformation and development from different aspects.

In response to the worldwide changes and challenges, the Chinese government has put forward the Belt and Road policy and the policy of building an integrated Guangdong-Hong Kong-Macao Greater Bay Area (Abbreviated in the text as GBA). These are currently two of China's most important policies closely linked to the world economy. In the new round of global economic reform, GBA also faces the pressure of industrial upgrading and competition of city clusters worldwide. These two policies will be introduced next.

The GBA is not a single geographical concept, nor is it an emerging regional concept, but a multi-disciplinary concept based on the development of the Pearl River Delta (Abbreviated in the text as PRD) city cluster (located in Guangdong province, southern China). The PRD city cluster consists of nine cities in the PRD region (Guangzhou, Shenzhen, Zhuhai, Foshan, Huizhou, Dongguan, Zhongshan, Jiangmen and Zhaoqing) and six expanded cities (not relevant to this article). The GBA, consists of the nine cities in the PRD region and the two Special Administrative Regions of Hong Kong and Macao. Following the promulgation of the *Outline*, GBA integration officially became one of the national development strategies.

Figure 1. Cities Included in GBA

Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area
(Abbreviated in the text as outline)
(official website https://www.bayarea.gov.hk/sc/home/index.html)

The State Council promulgated the Outline Development Plan on February 18, 2019. The Plan covers the period up to 2022 in the immediate term, extending to 2035 in the long term. Key strategies include:

➢ Spatial layout, namely building on the four core cities of Hong Kong, Macao, Guangzhou, and Shenzhen as core engines for regional development, leveraging the core cities' comparative advantages in striving for excellence and achievements, and strengthening the radiating effect in leading the development of nearby regions.

➢ Policy measures for developing a global innovation and technology (I&T) hub, expediting infrastructural connectivity, building a globally competitive modern industrial system, taking forward ecological conservation, developing a quality living circle for living, working and travelling, strengthening cooperation and jointly participating in the Belt and Road Initiative, jointly developing Guangdong-Hong Kong-Macao cooperation platforms, as well as the implementation of the *Outline*.

When it comes to the Belt and Road Policy, *Vision and Action*, the programmatic document of the Belt and Road elaborates on its action plan in eight aspects: background, principles of joint construction, framework ideas, cooperation priorities, cooperation mechanisms, openness in various parts of China, China's positive actions and creating a better future together.

In short, its core lies in "sharing" and "interoperability", with "interoperability" being the basis and means and "sharing" being the principle and purpose. Many Chinese and international scholars have interpreted this from different perspectives. Some scholars see the Belt and Road from a geopolitical perspective as a "Chinese version of the Marshall Plan" and a strategic fulcrum for reshaping the international system with China at its center (Hu, 2017). Some scholars interpret the Belt and Road from a broader perspective of history, culture, and the world and Asia. Naturally, China's specificity cannot be erased as a Chinese initiative. The Belt and Road initiative can only be interpreted from a broader perspective. However, only by interpreting the Belt and Road from a broader perspective can it be genuinely interpreted in the sense of "sharing" and "interoperability" that it has demonstrated since its implementation.

The integration of GBA as an ongoing project is subject to many uncertainties. Has this policy brought about positive effects at the economic level? What are the problems in GBA development under the influence of the Belt and Road Policy? This thesis will therefore focus on these two policies and explore the economic development of GBA under these two policies.

1.1 Aim and Research Questions

The aim of the thesis is to analyze and discuss the effectiveness, development situation and challenges of the GBA integration policy and the Belt and Road policy. The purpose is to understand whether the integration of GBA actually facilitates regional economic development as it proclaims to do. To realize this aim, the following questions have been posed:

➢ How large is the effect of the Guangdong-Hong Kong-Macao Greater Bay Area Integration Policy and the Belt and Road Policy in terms of GDP growth?

➢ Considering the characteristics of the Bay Area economy, what role do the Guangdong-Hong Kong-Macao Greater Bay Area Integration Policy and the Belt and Road Policy play in the economic development of this region?

1.2 Thesis Structure

Firstly, this thesis briefly outlines the development of GBA and provides a review of the research on regional economic integration and the Bay Area economy in China and international literature. Secondly, this thesis presented a theoretical review of regional economic integration theory and the Centre-Periphery Model and combined it with research and analysis. Then, the Difference-In-Differences Estimation method is used to test whether the implementation of the GBA integration policy and the Belt and Road policy has positively contributed to the economy's growth and to measure the magnitude of their effects. Finally, a discussion on the continued economic development and integration of GBA is conducted based on the findings of the empirical quantitative analysis.

Chapter 2. Background

This chapter provides a complete overview of the GBA, the GBA integration policy, the Belt and Road policy and the research value of conducting GBA studies.

The GBA is one of China's most open and economically dynamic regions, and has an important strategic position in the state's overall development. 18 February 2019, the Central Committee of the Communist Party of China and the State Council issued *The Outline of the Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area*. According to the Outline, the object is to make GBA become a dynamic world-class city cluster, significant support for constructing the "Belt and Road", and a demonstration zone for in-depth cooperation between the Mainland, Hong Kong, and Macao. The four major cities of Hong Kong, Macao, Guangzhou, and Shenzhen, are thought to serve as the core engines of regional development. The GBA has emerged as the pivotal actor since the Chinese authority announced its city-cluster plan.

Figure 2. Hong Kong-Zhuhai-Macao Bridge (Chinese National Geography 中国国家地理网 (dili360.com))

In September and October 2013, President Xi Jinping proposed in Kazakhstan and Indonesia respectively the strategic initiatives of regional cooperation and the joint construction of the Silk Road Economic Belt and the 21st Century Maritime Silk Road. These initiatives aim to promote the free and orderly flow of economic factors, the efficient allocation of resources

and the deep integration of markets. The goal is to promote the coordination of economic policies among countries along the route, develop a more expansive, higher, and more profound level of regional cooperation, and jointly build an open, balanced, and inclusive regional economic cooperation framework.

Figure 3. Map of Belt and Road policy (Chinese National Geography 中国国家地理网 (dili360.com))

In recent years, under the framework of CEPA, the economic integration of GBA has achieved some success, but it is still not smooth (Pollard, 2005). For GBA, the Belt and Road policy is undoubtedly a significant strategic opportunity. The governments of the major cities in the Guangdong, Hong Kong and Macao Greater Bay Area have made it their goal to improve the competitiveness of GBA in the world. Under the leadership of the Belt and Road policy, the unique geographical location and the already existing economic advantages of GBA will facilitate an unprecedented integration in the region.

At the same time, the construction of the Belt and Road is by no means a straight path. It is likely to face many difficulties and risks, including geopolitical instability, poor business environment, differences in identity, constraints in the game of major powers, and insufficient capacity of enterprises to participate (Li, 2019). Based on this, a more systematic, specific, precise and feasible policy framework and tools have become the need of the new era.

2.1 Development History

Looking back on history, the formation and evolution of China's specific economic development model (One Country Two Systems: coexistence of socialism and capitalism) and the history of economic cooperation among GBA are closely related. At the forefront of China's "Reform and Opening-up" in 1978, GBA is the beginning and window of contact between mainland China and the world economy and a channel and platform for connecting the domestic economy with the external economic system (Hui, Li, Chen, & Lang, 2020).

In the new era, along with implementing the Belt and Road policy, promoting the integrated regional economic development of GBA is in line with China's practical need to break through the shackles of economic development and achieve economic transformation and development (Dong-Ha, 2019). For GBA, which has become one of China's economic growth leaders, the new goal is to realize integrated economic development and build an internationally competitive industrial accumulation and an urban structure system. This is a reinterpretation of China's economic development history since the reform and opening up of the country at a higher level and with a new connotation.

In China, establishing city clusters is a two-step policy implementation process, including central solid state planning and local authority. The development of city-cluster regions such as the Pearl River Delta, Yangtze River Delta and Beijing-Tianjin-Hebei Economic Zone has been studied by a few experts (Guo, Han, Yang, & Di, 2020). Some cities from these city clusters will also be included in the control group in the methodology section.

Guangzhou, Shenzhen, and Hong Kong have formed a triangular structure that has contributed to establishing the GBA city cluster (Deng & Li, 2021). Nonetheless, scholars have largely ignored this growing phenomenon, particularly about the GBA. GBA includes Guangzhou, Shenzhen, Foshan, Dongguan, Huizhou, Zhuhai, Zhongshan, Jiangmen, and Zhaoqing, all in Guangdong Province and the two special administrative regions (SAR) of Hong Kong and Macao. It covers a total land area of 56 thousand square kilometres. The population of the GBA is estimated to be over 67 million people.
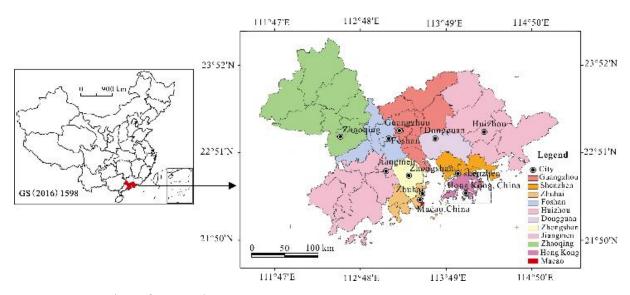
Figure 4. Location of Guangdong-Hong Kong-Macao Greater Bay Area

2.2 Research Significance

GBA is one of the four major Bay Areas in the world. With the Bay Area's emergence as one of Asia's major economic centers, as well as its rapid manufacturing-driven economic growth and the construction of large-scale cross-regional infrastructure, it has become China's most developed region, with residents' incomes now comparable to those in developed countries (Yang, Xia, & Zhang, 2018). The demand for high-value-added services, high-tech industrial items, and niche luxury goods has expanded dramatically in the local market. As a result, the GBA has grown in importance as a worldwide consumer market that no international corporation can afford to ignore. As a result, the case of GBA is both exciting and crucial to the study of regional development in general and China in particular.

In addition, the GBA is also a typical representative of the Bay Area economy and Bay Area city clusters. Its development is of high research value. As a highly open region formed by sharing bays and islands, the Bay Area has broken through the limitations of administrative geographical boundaries (Zhou, Du & Liu, 2020).

Throughout the world map, the more maturely developed typical Bay Areas, such as the New York Bay Area, the San Francisco Bay Area, and the Tokyo Bay Area, all exhibit characteristics such as a substantial economic volume and a highly developed level of openness deeply integrated technological cooperation. These Bay Area economies act as

leaders in their economic development and play an essential role as a link in the world economic system (Wong, 2013). So, is the Bay Area economic development strategy, represented by GBA, effective in promoting regional economic growth? How much of a boost is it? What are the main mechanisms or channels through which this can be achieved? The answers to these questions are of great practical significance in exploring the path of regional economic development and enhancing the growth effect of the Bay Area economic development strategy. In the literature review chapter, this thesis will also analyze the development of GBA by conducting a comparative study of other Bay Areas around the world.

China has a highly centralized governance system, and the central government has historically dominated regional development planning. A highly centralized system of authority is that top-down policies can be implemented efficiently, central policies can be implemented quickly at the regional level, and the regions can be assured of compliance with the outlines. However, the disadvantages are also obvious: the policies formulated by the centre are not easily adapted to the situation in the regions, and it is difficult to respond to problems that arise in the implementation of policies at the authority centre (Liang, 2021). The GBA relevant study will aid in exploring regional planning diversity in the context of its political economy. The GBA is not only a critical area of research for China's pursuit of sustainable development, but it also has theoretical ramifications and global policy consequences.

Chapter 3. Literature Review

This chapter shows the literature review synthesizes research on urban agglomerations in the Bay Area. The research on the Bay Area urban agglomeration is a research gap in the current research related to the GBA. The Bay Area has a natural geographical advantage in external communication and interaction as an open economy. Focusing on connectivity and development between the regional economies represented by the cities within the Greater Bay Area will significantly enhance the competitiveness and influence of the Bay Area economy. Therefore, this thesis will review the development of the Bay Area Economic study and the main research components. This has important implications for the future development of the GBA.

The GBA is a typical representative of the Bay Area economy and urban agglomeration. Compared with other famous bay areas in the world, the development of GBA is still at an immature stage. The existing literature on the urban agglomeration in the GBA is not comprehensive enough and mainly focuses on qualitative analysis, lacking empirical studies to support it. Current research mainly focuses on the central cities of the GBA, Hong Kong, Guangzhou, and Shenzhen. Only a few papers have proposed the concept of urban agglomeration and the creation of a unified Bay Area economy.

3.1 International Research Literature

The term "Bay Area Economy" originates from the San Francisco Bay Area in the United States. At present, the world has formed three famous Bay Areas, namely San Francisco Bay, New York Bay and Tokyo Bay, which are the three most influential Bay Areas in the world, with their open culture, developed industries and regional collaboration, representing the direction of mature Bay Area economic development. International research literature on the Bay Area economy has mainly focused on the three major Bay Areas, studying industrial transfer, urban development, technological progress, institutional structures, and some of their specific areas within the Bay Area.

The following are representative: Miyajima and Kwak (1989) studied the linkages between ports and the hinterland in the Tokyo area, which belonged to the first generation of basic research on the port economy of the Bay Area; Saxenian (1991) analyzed the establishment and evolution of the production system in the Silicon Valley region; Walker (2001) studied the industrial division of labour in the San Francisco Bay Area and analyzed the trend of manufacturing industries moving to the Bay Area; T. Bunnell, P.A. Barter and S. Morshidi (2002) used the spatial linkages of information technology flows, and goods flow in cities to reflect the regional trend of cities. Makarem (2015) examines the relationship between the San Francisco Bay Area and the South Bay Area through the period 1980 to 2010; Makarem (2013) studied the special role of social networks in the economic development of the San Francisco Bay Area, which is gradually transforming into a higher-level regional economy without the inherent support of social network structure theory.

3.2 Chinese Research Literature

The earliest proposal for "Bay Area Economy" in China can be traced back to around 1997, when Hong Kong scholars such as Wu Jiawei and Tian Changlin first proposed the idea of building a 'Hong Kong Bay Area', based on the experience of the San Francisco Bay Area (Zhang, Sui, & Chen, 2018). In recent years, Chinese scholars have been conducting many research on the Bay Area economy. The current economic research on the GBA has been conducted in the following areas.

➢ By summarising the research results on the formation, definition, types of development and specific economic connotations of the Bay Area economy.

According to Yao, Wang, and Jiang (1998), the success of the San Francisco Bay Area lies in the high quality of educational resources and talent delivery, the large concentration of venture capital, the development of small and medium-sized enterprises, and the natural environment suitable for survival under the global conditions; Liu (2014), through a summary of the experience of overseas bay area planning, proposes: attaching importance to the intensive investment of intellectual resources in the bay area, paying attention to the conflict between the limited resource and environmental carrying capacity and the long-term development process; Lu, Pan, and Yan (2015) constructed a four-dimensional evaluation

system to comprehensively consider the four major global Bay Areas, and the results showed that the GBA still has considerable gaps compared with the three major Bay Areas in the world, but at the same time has regional characteristics, and should focus on developing an innovation-driven system and accelerating the innovation of institutional mechanisms; Shen and Ma (2017) argue that the Bay Area has a relatively high level of openness and can play a role in driving the development of economies within the region, and that the development of China's Bay Area is now basically equipped with the primary conditions for the formation of a regional economy, and that emphasis should be placed on driving regional economic development through the principle of sharing and forming a new pattern of opening up to the outside world with the Bay Area as the leader.

➢ Based on the findings of studies related to the integration of the Pearl River Delta, it extended to the broader economy of the GBA.

The cooperation between Guangdong, Hong Kong and Macao began during the "Reform and Opening-up" period when Hong Kong and Macao enterprises moved low-growth and labour-intensive industries to Mainland China. The manufacturing industry in the PRD region has developed a system of the cross-regional industrial division of labour and cooperation. The deepening of cooperation was marked by the Closer Economic Partnership Arrangement (CEPA) in 2003, which shifted from cooperation in manufacturing to liberalization of trade in services. Chinese scholars have mainly elaborated on the theory of the economic construction of GBA from the perspective of regional cooperation mechanisms and the economic ties between Guangdong, Hong Kong and Macao.

Chen and Lin (2009) argues that the public management of Guangdong, Hong Kong and Macao (cross-border) region under "One country, Two systems" has basically taken shape, and its mechanism is an executive-led network governance under "One country, Two systems"; Chen (2008) argued that Guangdong, Hong Kong and Macao need to address the transfer of labour-intensive enterprises, the division of labour and cooperation in modern service industries, the institutional barriers under CEPA, and the enhancement of the level of financial cooperation between Guangdong and Hong Kong by deepening cooperation; Bing and Mao (2017) studied the geo-matching relationship between Guangdong, Hong Kong and Macao based on spatial economic ties, geo-economic relations and the combination of the two, and concluded that the geo-economic relations between the PRD region and Hong Kong,

Macao and Taiwan showed an increasingly competitive dynamic; Wang (2018) argued that the evolution of the economic cooperation system in Guangdong, Hong Kong and Macao has a significant impact on the country's economic policy and environment; Chen (2017) cut from the perspective of Hong Kong's participation in the construction of the Guangdong-Hong Kong-Macao Greater Bay Area, with the rapid development of the mainland economy, Hong Kong faces the absence of leadership in traditional areas of advantage, social problems With the rapid economic development in the Mainland, Hong Kong is facing problems such as the lack of leadership in traditional areas of strength, the accumulation of serious social problems and the emergence of new situations in the practice of "one country, two systems". Both Hong Kong and the Mainland should seize the opportunity of the construction of the Guangdong-Hong Kong-Macao Greater Bay Area and look at the current cooperation from a transcendent perspective; Jia and Wai (2018) found that Hong Kong's economic transformation has three main characteristics from the perspective of spatial economics, namely the obvious small economy, time for space and regional industrial chain cooperation, and pointed out that at present, Hong Kong's economic transformation mainly faces two major dilemmas: economic hinterland and labour force; Han and Zhang (2018) examine the current situation of the development of the Guangdong-Hong Kong-Macao Greater Bay Area from the perspective of supply-side reform and analyze the supply-side problems that exist in the collaborative development of the Greater Bay Area from the perspective of institutional supply, factor flow and the structural level of regional development.

➢ Because of the special political and economic structure of GBA region of "one country, two systems and three taxations (legal) zones", the researchers provide a reference for policy decisions on the economic construction of the GBA from the perspective of the regional government and inter-city relations.

Chen, Zheng, and Deng (2010) summarised the dilemma of Guangdong, Hong Kong and Macao as high transaction costs and institutional costs, differences in government public management models, and homogenous competition among regions; Wang (2018) argues that the Pearl River Estuary region, where the Guangdong-Hong Kong-Macao Greater Bay Area is located, shows a multi-level development pattern, with no clear division of labour among cities, and thus relatively weak aggregation power. Guangzhou has a good basis of cooperation with Hong Kong and Macao, and a relatively benign competition with Shenzhen and Zhuhai, thus proposing Guangzhou as the core for city cluster construction; Xiao and

Guo (2018) argue that the current spillover effects generated by the economic development of the PRD region cannot be transmitted to Hong Kong and Macao due to the barriers of differentiated economic forms, and that Hong Kong's economic development gradually lags behind that of the Mainland; Chen and Lin (2018) argue that the cities in the Guangdong-Hong Kong-Macao Greater Bay Area have a high degree of industrial interconnectedness and a convergence of industrial structures; Guan, Tang and Li (2018) argue that the implementation of central authority and comprehensive governing power is the core political guarantee for building the regional governance system in the Guangdong-Hong Kong-Macao Greater Bay Area, and thus the construction of the regional governance system is crucial.

3.3 Chapter Summary

This chapter provides an overview of the research on the Bay Area economy in Chinese academia, including the history and current status of the research. This chapter also briefly introduces international scholars' research on the Bay Area economy. Based on the above literature, it is clear that both international and Chinese scholars have concluded that the development of the Bay Area economy and Bay Area integration can promote regional economic growth and even drive the overall development of the state and the wider region. However, there is still a lack of sufficient systematic theoretical works and empirical studies on the Bay Area Economy.

Chapter 4. Theoretical Framework

This chapter demonstrates the main theories used in this thesis, on which the subsequent analysis and discussion build.

4.1 Regional Economic Integration Theory

The theory of regional economic integration forms the backbone of this thesis. The study of economic integration first came about through the combination of firms and later through the association of regional economies. The concept of economic integration was first introduced by Jane Tinbergen. She argued that "economic integration is the artificial elimination of the factors that impede the most efficient functioning of an economy and the creation of the most appropriate international economic structure through mutual collaboration and unification" (Kourtit, 2011).

Free trade zones are the most common and basic form in today's regional economic integration organizations. Both free trade zones and customs unions promote the efficient operation of product markets by removing tariff barriers in the region. In international trade studies, a free trade area is an international economic integration organization formed when two or more countries or economies agree to remove tariff restrictions and other equally binding restrictive policies. The difference between a free trade area and a customs union is that, firstly, each economy determines its tariff rate rather than a uniform tariff for imports from outside the cooperation area. The second is that the principle of origin applies in trade zones, i.e., goods that meet the criteria for free trade only if they originate within the cooperative region. The free trade zone doctrine has the same effects on trade diversion and trade creation. Free trade zones allow importing countries to avoid unnecessary trade diversion losses due to unilaterally lowered barriers.

According to the *outline*, GBA is the most supported developing free trade zone in China. This thesis, therefore, adopted the perspective of regional economic integration to examine the economic development of the GBA. In this thesis, the regional economic integration theory is applied in the following ways.

4.1.1 The Agglomeration Effect

According to regional economic theory, the agglomeration effect drives economic resources and activities in a region towards a specific area. It is a fundamental factor driving the formation and expansion of cities. The agglomeration effect of the Bay Area economy is mainly reflected in two aspects: factor agglomeration and industry agglomeration. The Bay Area, with its good location, excellent infrastructure and modern transport system, attracts a large number of foreign people, advanced technology and equipment, as well as sufficient capital supply from domestic and abroad, providing human capital, technical support and financial support for the development of the regional economy. The agglomeration of factors has further contributed to increased labour productivity and land intensification, lowering inter-regional transaction costs and facilitating efficient production by enterprises, thus contributing to the gradual transformation of the Bay Area's comparative advantage industries from labour to technology-intensive or capital-intensive industries. This rationalized, and advanced industrial structure has a sustainable role in promoting high-quality economic development (Sun, 2021).

4.1.2 The Economic Radiation Effect

According to regional economic integration theory, the economic radiation effect refers to the flow and transfer of capital, markets and other factors between regions with relatively high levels of economic development and modernization and regions with less advanced economic development, thus further improving the efficiency of economic resource allocation. The development model of the world's three largest bay areas is based on a few highly developed cities as the core. Through the polarization effect of the core cities, capital, talent and other factors are concentrated in developed areas. Then through the radiation effect, economic power and innovation results are transmitted to the surrounding areas, thus forming a "polarization-diffusion" effect between the core cities and the surrounding areas. This creates an intrinsic network of economic links between the core cities and the surrounding areas, with a "polarization-diffusion" effect. There is two-way radiation between the developed cities and the backward cities in the economic radiation. Each city in the region can give full play to its advantages and ultimately achieve the purpose of narrowing the economic development gap.

4.1.3 Collaboration Effect

In regional economic integration theory, the Bay Area is one of the essential models for regional economic development. By clarifying the division of labour and development paths between core cities within the Bay Area, between core cities and other cities, and between city clusters and the peripheral hinterland, not only can the Collaboration effect within the region be fully exploited, and the speed of regional development be increased, but also the overall competitiveness of the Bay Area city clusters can be enhanced (Xia, Sun, & Lin, 2018). Economies of scale and scope are realized. Economies of scale and scope. Because of this Collaboration, the six world-class ports in Tokyo Bay have been able to avoid unhealthy competition and link up to form a wide area of ports and harbors. This Collaboration has enabled the six world-class ports in Tokyo Bay to avoid unhealthy competition and link up to form a wide area of harbors to support the core functions of the Tokyo Metropolitan area. The Collaboration of the Bay Area's economy is essential for the efficient allocation of resources and for enhancing the Bay Area's competitiveness. The synergistic effect of the Bay Area economy is therefore crucial in promoting the efficient allocation of resources in the Bay Area, enhancing the core competitiveness of the Bay Area and promoting the integrated development of the Bay Area economy.

In summary, theoretically, the Bay Area economic integration strategy can significantly contribute to regional economic growth and has a growth-driving effect on the regional economy. Realistic data in the following section support this conclusion.

4.2 Core–Periphery Model

The core-periphery model is developed by the American scholar John Friedmann (Wang & Jiang, 2011). The starting point for Friedmann's thinking is innovation, which he sees as a process of regional development through the innovation of a small number of 'centers of change' within the region, with innovation spreading from the center to the periphery and the periphery becoming dependent on the centre (Oxford Reference, n.d.). As boundaries fade, the region eventually becomes spatially integrated.

There are four main areas of spatial integration: First, the discrete spatial structure, where there is little movement of factors. Second is the robust industrial structure, representing the early stages of industrialization. The third is the diffuse spatial economic structure, marking the mature stage of industrialization. Fourth is the stage of spatial economic integration, where the free movement of factors represents the spatial structure of the economy entering a balanced stage (Geography Revision, n.d.). The core-periphery regional economic development situation is an advanced stage of regional economic integration through the central zone's innovative aggregation and diffusion effect, which guides and dominates the peripheral zones.

The core-periphery model is a theory that explains the evolutionary pattern of economic and spatial structure. It illustrates regions' development from a relatively isolated, equilibrium state to an unbalanced pattern of centers and edges. And then gradually evolves into an interdependent and interrelated equilibrium state. At the same time, the theory provides new thinking on economic development and changes in spatial structure and provides a theoretical basis for resolving inter-regional development imbalances.

The development and evolution of the GBA region are consistent with the four stages of the core-periphery model. Therefore, this theory is appropriate for analyzing the GBA's current development and challenges. The GBA is in the process of evolving from stage three to stage four. Within the GBA, it is still mainly Hong Kong, Macao, Guangzhou, and Shenzhen that play the role of the central cities, driving the neighboring cities and attracting labor from the surrounding areas to concentrate in the central cities. According to the outline, the development goal is then the fourth stage, breaking down the barriers between cities and achieving the spatial and economic integration of the region.

Chapter 5. Methodology

This chapter will describe the research approach, research methodologies, the model used, and lastly, how obtained data will be structured, processed, and analyzed to answer the research questions in this thesis.

5.1 Research Design

This chapter sets out the research methodology for examining the economic growth of the GBA under the influence of the Belt and Road Policy and integration policy. This thesis adopted the philosophical assumption of positivism and a quantitative approach. This means that questions are stated propositionally and subjected to an empirical test to verify them; simultaneously, confounding conditions are controlled to prevent outcomes from being "improperly influenced" (Denzin & Lincoln, 1994, p. 110). This research design is based on an empirical analysis of economic data. The aim is to determine whether the GBA integration policy and the Belt and Road policy have contributed to the economic growth of this region.

Given that the Bay Area Economic Development Strategy is the beginning of integrated cooperation in the GBA, this thesis examines the effect of GBA integration policy on GDP growth. The construction of GBA under the guidance of the Belt and Road policy can be seen as a policy experiment based on the development of the PRD city cluster, and the evaluation of the effects of such a policy is usually analyzed using the DID model (Chen, 2019). This approach tests the impact of the policy by comparing the change in the difference between the sample affected by the policy and the sample not affected by the policy before and after the experiment (Card & Krueger, 2000). This kind of analysis falls within quantitative research. The reason for adopting this research approach is that it allowed for a more accurate determination of whether economic growth, as defined by Card and Krueger (2000), takes place or not. Specifically, if the integration of GBA is effective in promoting GDP growth, then the two policies have a growth-driving effect on the regional economy; conversely, if the integration of GBA fails to promote GDP growth, then the two policies are considered to exert a policy trap effect.

Concerning ethical considerations, as the data collected and used in this paper are derived from publicly available information from governments and organizations and do not involve personal data, there are no considerations of personal privacy or other breaches of unethical conduct.

5.2 Model Construction

5.2.1 Model Introduction

In order to examine whether the establishment of GBA and the Belt and Road Policy has had a positive effect on the economic growth of the region, data were collected before and after the establishment of GBA. An empirical model based on Difference-In-Differences Estimation is constructed to test whether the establishment of GBA and the Belt and Road Policy can promote economic growth and to measure the degree of the growth effect.

Difference-In-Differences Estimation (DID) is an econometric method. It is based on the principle that the effect of a policy or measure can be calculated by comparing the average change over time in the outcome variable between the treatment and control groups. It is an assessment method for testing the effect of a policy (Chen, 2019).

DID, which is essentially a fixed effects estimator for panel data, largely avoids the problem of endogeneity, as policies are generally exogenous to individual microeconomic agents. In addition, this also alleviates the problems arising from omitted variable bias. Therefore, this thesis attempted to test whether there is an economic growth effect of the policy of integrating GBA and Belt and Road using the DID method.

5.2.2 Sample Choice

On 5 March 2017, the *Government Work Report* of the Fifth Session of the 12th National People's Congress proposed formulating a development plan for the GBA city cluster. On 1 July of the same year, the National Development and Reform Commission and the governments of Guangdong, Hong Kong and Macao signed an agreement in Hong Kong on *Deepening Cooperation among Guangdong, Hong Kong and Macao and Promoting the*

Framework for the Construction of the Greater Bay Area, marking the official start of the integration process of the GBA.

Accordingly, I set 2017 as the year in which the GBA policy is implemented and 2016 as the year prior to the implementation of the policy.

I set 11 cities in GBA (Guangzhou, Shenzhen, Zhuhai, Foshan, Dongguan, Huizhou, Zhongshan, Jiangmen, Zhaoqing, Hong Kong and Macao) as treatment group (*Treat*).

I set the other 12 cities in Guangdong Province (Zhanjiang, Maoming, Yangjiang, Yunfu, Shaoguan, Qingyuan, Meizhou, Heyuan, Shantou, Chaozhou, Jieyang and Shanwei), which are not included in GBA, as the control group (*Control*).

Considering the representativeness, economic strength, the different regions they are located in, the economic and financial management authority, I divided the four municipalities directly under the Central Government (Beijing, Tianjin, Shanghai and Chongqing) and the four cities under the State Plan (Dalian, Qingdao, Ningbo and Xiamen) into the control group.

By comparing the differences between the treatment and control groups after the establishment of GBA, the impact of the integration and Belt and Road policy on the overall economic growth of cities within the GBA is further examined.

5.2.3 Model Design

The model was set up with four groups as follows: pre-establishment treatment group, pre-establishment control group, post-establishment treatment group and post-establishment control group. Two dummy variables, city and time, were also set to measure: city was set to *dc*, denoted by 1 for the treatment group and 0 for the control group; time was set to *dt*, denoted by 0 for the pre-establishment group and 1 for the post-establishment group.

The groups are shown in Table (1) below.

Table 1

Groups Set

dc	*dt*			
	Pre-establishment		Post-establishment	
Treat	*dc=1*	*dt = 0*	*dc=1*	*dt = 1*
Control	*dc=0*	*dt = 0*	*dc=0*	*dt = 1*

5.2.4 Data Analysis

The regression equation based on DID to measure the degree of the economic growth of GBA on 11 cites is shown in Equation (1), where *y* denoted the GDP growth, *β* denoted the coefficients of different variables, *i* denoted different cities, *t* denoted before or after the implementation of the policy, and *ε* denoted the disturbance term:

$$y = \beta_0 + \beta_1\, dc_{it} + \beta_2\, dt_{it} + \beta_3\, dc_{it} \cdot dt_{it} + \varepsilon_{it} \qquad\qquad \text{Equation (1)}$$

➢ **Control Group**

First, in the control group, since $dc_{it} = 0$, the economic growth *y* before and after the implementation of the policy is as follows:

Before the established of GBA, since $dt_{it} = 0$, so

$$y_{it} = \beta_0 + \beta_1 \cdot 0 + \beta_2 \cdot 0 + \beta_3 \cdot 0 \cdot 0 + \varepsilon_{it} = \beta_0 + \varepsilon_{it} \qquad\qquad \text{Equation (2)}$$

After the established of GBA, since $dt_{it} = 1$, so

$$y_{it} = \beta_0 + \beta_1 \cdot 0 + \beta_2 \cdot 1 + \beta_3 \cdot 0 \cdot 1 + \varepsilon_{it} = \beta_0 + \beta_2 + \varepsilon_{it} \qquad\qquad \text{Equation (3)}$$

Therefore, the GDP growth rate (economic growth rate) $diff_{y1}$ of the control group in the period before and after the establishment of the policies is Equation (3) minus Equation (2)，i.e. $(\beta_0 + \beta_2 + \varepsilon_{it}) - (\beta_0 + \varepsilon_{it}) = \beta_2$.

> **Treatment Group**

Secondly, in the treatment group, since $dc_{it}=1$, the economic growth y before and after the establishment of GBA is as follows:

Before established GBA, since $dt_{it} = 0$, so

$$y_{it} = \beta_0 + \beta_1 \cdot 1 + \beta_2 \cdot 0 + \beta_3 \cdot 1 \cdot 0 + \varepsilon_{it} = \beta_0 + \beta_1 + \varepsilon_{it} \qquad \text{Equation (4)}$$

After established GBA, since $dt_{it} = 1$, so

$$y_{it} = \beta_0 + \beta_1 \cdot 1 + \beta_2 \cdot 1 + \beta_3 \cdot 1 \cdot 1 + \varepsilon_{it} = \beta_0 + \beta_1 + \beta_2 + \beta_3 + \varepsilon_{it} \qquad \text{Equation (5)}$$

Therefore, the GDP growth rate (economic growth rate) $diff_{y2}$ of the treatment group in the period before and after the establishment of the policies is Equation (5) minus Equation (4), i.e. $(\beta_0 + \beta_1 + \beta_2 + \beta_3 + \varepsilon_{it}) - (\beta_0 + \beta_1 + \varepsilon_{it}) = \beta_2 + \beta_3$.

In summary, the "net growth" for the 11 cites in GBA as a result of the two polices is $diff_{y2} - diff_{y1} = \beta_2 + \beta_3 - \beta_2 = \beta_3$. It measures the impact of the policies of integrating the GBA and Belt and Road on the growth rate of the Greater Bay Area's gross regional product (economic growth rate), i.e., the economic growth effect. As shown in Table (2) below:

Table 2

Measurement of Economic Growth Effects by DID

	Before policy	After policy	Differential item
Control Group	$\beta_0 + \varepsilon_{it}$	$\beta_0 + \beta_2 + \varepsilon_{it}$	β_2
Treatment Group	$\beta_0 + \beta_1 + \varepsilon_{it}$	$\beta_0 + \beta_1 + \beta_2 + \beta_3 + \varepsilon_{it}$	$\beta_2 + \beta_3$
Differential Item	β_1	$\beta_1 + \beta_3$	β_3

5.3 Data Collection Methods

The model is based on secondary data from the statistical yearbooks and statistical information networks of 21 cities in Guangdong Province (including 9 cities in the Greater Bay Area and 12 cities in the non-Greater Bay Area) and 8 other cities, as well as the websites of the Statistics and Census Bureau of the Hong Kong Special Administrative

Region, the Statistics and Census Bureau of the Macao Special Administrative Region, and the Development Research Centre of the State Council.

In the empirical analysis of DID, I set the explanatory variable as GDP growth (in %). The explanatory variables are: the average number of employees in employment (*labour*) (in million) and the total investment in fixed assets (*k*) (in RMB billion).

The control variables are: the number of students in general higher education (*education*) (in 10,000), the year-end balance of urban and rural residents' savings (in RMB billion), and local general budget expenditures (in RMB billion).

The results of the descriptive statistics for each variable for each city in the GBA are shown in Table (3) below:

Table 3

Descriptive Statistics for Data by DID

Variate	Average	Standard Deviation	Minimum	Maximum
GDP growth	7.9969	2.9021	0.0143	15.1978
labor	160.7231	192.2787	18.5400	812.8600
k	6388.9500	17587.2800	454.6211	108936.6100
education	18.0612	25.1672	0.5866	106.7335
savings	6702.2000	10623.0000	428.3441	53298.2500
gov expenditures	1412.3560	1906.5580	146.6967	7547.6200

Chapter 6. Results

Based on the research methodology in Chapter 5, this chapter substitute data into STATA software and produce results. This chapter presents the results of the empirical analysis. Data comes from National Statistical Office, Guangdong Provincial Bureau of Statistics, Hong Kong Government Statistics Department, Macao Statistics Authority.

http://www.stats.gov.cn/

http://stats.gd.gov.cn/

https://www.censtatd.gov.hk/sc/

https://www.dsec.gov.mo/zh-CN

6.1 Results

6.1.1 First Step

Consider the empirical regression model without the explanatory and control variables and set it as follows:

$$GDP\ growth\ _{it} = \alpha + \beta_1 \cdot dc_{it} + \beta_2 \cdot dt_{it} + \beta_3 \cdot dc_{it} \cdot dt_{it} + \varepsilon_{it} \qquad Equation\ (6)$$

Where *GDP growth* represented the growth rate of GDP; $t = 1, 2$, represented period 1 (before the establishment of the GBA) and period 2 (after the establishment of the GBA); $i = 1, 2, 3...31$, represented the 11 cities in GBA corresponding to the implementation of policies and the 12 cities in the corresponding control group. The results in Table () below were obtained using the STATA software.

The results in Table (4) show that the DID estimate of *GDP growth* is 4.476, which means that after the implementation of the two policies, the 11 cities in GBA can increase their *GDP growth* by 4.476%, with a probability value of P is 0.002, the result passes the statistical test of significance at 1%.

Table 4

Test Results for GDP Growth Rate Without Explanatory and Control Variables by DID

Outcome var.	GDP growth	S. Err.	$|t|$	P>$|t|$
Before				
Control	7.982			
Treated	7.147			
Diff (T-C)	-0.834			
After		0.996	-0.84	0.406
Control				
Treated	7.016			
Diff (T-C)	10.658			
	3.642			
		0.996	3.66	0.001***
Diff-in-Diff	4.476	1.409	3.18	0.002***

R-square: 0.20

* Means and Standard Errors are estimated by linear regression

**Inference: *** p<0.01; ** p<0.05; * p<0. 1

6.1.2 Second Step

Consider that the establishment of GBA will have positive effects in the context of economic development. With freer movement and allocation of factors, more enterprises will increase their investments in GBA, and employees' wages will increase.

Therefore, the model introduces the explanatory variables of the average number of employees in employment (*labor*) and total investment in fixed assets (*k*) for empirical analysis to test whether these two explanatory variables can be regressed to increase the rate of economic growth, i.e., the explanatory variable. The regression model is set up as follows:

$$GDP\ growth_{it} = \alpha + \beta_1 \cdot dc_{it} + \beta_2 \cdot dt_{it} + \beta_3 \cdot dc_{it} \cdot dt_{it} + \beta_4 \cdot lnlabor_{it} + \beta_5 \cdot lnk_{it} + \varepsilon_{it} \quad Equation\ (7)$$

The results were calculated using the software STATA and are shown in Table (5) below.

Table 5

Test Results for GDP Growth Rate with the Introduction of Explanatory Variables by DID

Outcome var.	GDP growth	S. Err.	|t|	P>|t|
Before				
Control	11.193			
Treated	10.260			
Diff (T-C)	-0.933			
After		0.967	-0.96	0.339
Control	10.358			
Treated	13.930			
Diff (T-C)	3.572			
		0.968	3.69	0.001***
Diff-in-Diff	4.504	1.349	3.34	0.001***

R-square: 0.30

* Means and Standard Errors are estimated by linear regression

**Inference: *** p<0.01; ** p<0.05; * p<0. 1

The results show that the DID estimate of *GDP growth* is 4.504, which means that after the implementation of the two policies, there is a 4.504% increase in GDP growth in the 11 cities in GBA, with a probability value of P is 0.001, passes the statistical test of significance at 1%. Based on these two results, when the explanatory variables are included in the regression equation, the probability value of P decreases to 0.001, and the magnitude of the effect is not significantly different, while the significance level of *GDP growth* remains unchanged at 1%.

6.1.3 Third Step

The above model lacks control variables, as economic growth is also influenced by factors such as education levels, government revenues, and public savings, which may cause the model to be biased by missing variables if they are not taken into account.

Firstly, to a certain extent, high-quality human resources can contribute to the development of the regional economy. The model introduced the number of students enrolled in general higher education institutions (*education*) (source) to represent the level of higher education in GBA to measure the role of human capital on economic growth.

Secondly, the government plays an important role in the economic development of GBA, and increased financial investment in GBA will greatly contribute to the economic development, so the model introduced (*gov expenditures*) (source) to represent the level of government support in the Greater Bay Area.

Furthermore, savings are important to the economic development of a state or a region because the higher the savings balance, the more funds commercial banks can use to lend, and the more loans commercial banks can make to support the development of the real economy. Therefore, the model introduced the year-end savings balance of urban and rural residents (*savings*) (source) to represent the financial sector's contribution to the development of GBA. The regression model is set up as follows:

$$GDP\ growth_{it} = \alpha + \beta_1 \cdot dc_{it} + \beta_2 \cdot dt_{it} + \beta_3 \cdot dc_{it} \cdot dt_{it} + \beta_4 \cdot lnlabor_{it} + \beta_5 \cdot lnk_{it} + \beta_6 \cdot lneducation_{it}$$
$$+ \beta_7 \cdot lngovexpenditure_{it} + \beta_8 \cdot lnsavings_{it} + \varepsilon_{it} \hspace{2cm} Equation\ (8)$$

The results were calculated using the software STATA and are shown in Table (6) below.

Table 6

Test Results for GDP Growth Rate with the Introduction of Explanatory and Control Variables by DID

Outcome var.	GDP growth	S. Err.	|t|	P>|t|
Before				
Control	16.234			
Treated	15.086			
Diff (T-C)	-1.147			
After		1.013	-1.13	0.262
Control	15.520			
Treated	18.876			
Diff (T-C)	3.356			
		1.000	3.36	0.001***
Diff-in-Diff	4.503	1.340	3.36	0.001***

R-square: 0.44

* Means and Standard Errors are estimated by linear regression

**Inference: *** p<0.01; ** p<0.05; * p<0. 1

The results show that the DID estimate of GDP growth is 4.503, indicating that the 11 cities in GBA would experience a 4.503% increase in GDP growth after implementing the two policies, with a probability value of P is 0.001. The result passes the statistical test of significance at the 1% level. This result is consistent with the previous double-difference estimate of 0.001, obtained without the addition of control variables.

6.2 Chapter Summary

The policy of establishing and integrating GBA and Belt and Road Policy has an economic growth effect, with the economic growth rate of the 11 cities in GBA increasing to a certain extent. In the empirical analysis of the economic growth effect of GBA by DID, the growth rate of regional GDP shows an increasing trend without the explanatory and control variables (1), with the explanatory variables introduced (2), and with the explanatory and control variables introduced (3), as shown in Table (7) below.

Table 7

Results of Empirical Analysis of the Economic Growth Effects of GBA by DID

	GDP growth rate	
	DID estimates	*Probability values*
1	4.476	0.002***
2	4.504	0.001***
3	4.503	0.001***

* indicates passing a statistical test at the 10% level of significance, ** indicates passing a statistical test at the 5% level of significance, and *** indicates passing a statistical test at the 1% level of significance.

As seen in Table (7) above, the more explanatory and control variables are introduced, the larger the resulting DID estimates are, and the more significant the results are, indicating that this empirical analysis is valid.

The results of the above empirical analysis further demonstrate that there is indeed an economic growth effect after the establishment of GBA, which can increase the economic growth rate of GBA, and the relationship between the two is statistically significant. The relationship between the two is statistically significant, and the policy of establishing and

integrating GBA is effective. It also achieves the objective of this thesis that the policy of establishing the Guangdong-Hong Kong-Macao Greater Bay Area and Belt and Road will promote economic growth and increase the growth rate of regional GDP.

Chapter 7. Discussion

Based on the results of the empirical analysis in the previous chapter, this chapter offers a discussion of the development of GBA from different perspectives.

From the point of view of regional economic integration theory, a location at a port or transport centre is highly likely to become a new urban agglomeration, because in such a location there is always an extreme point of integrated transport costs for manufacturing, unless it is already at the edge of economic development. Unfortunately, Zhuhai is in such a position in the absence of a growth pole effect in Macao. Guangzhou, on the other hand, is in an excellent location as a transport hub, with a huge influx of labour resources to Shenzhen and the rest of Guangdong when the latter takes the lead in the country's development. This massive population growth that accompanies the region, interacting with the different returns to scale that exist for different commodities, will create a new central city where the most market potential exists, which in the GBA region is known as Guangzhou. Where there are many different types of manufacturing industries, a hierarchy of cities spontaneously forms around the central city. The formation of these cities of different sizes often depends on the combined forces of centripetal forces leading to agglomeration and centrifugal forces leading to dispersion, in line with the elaboration of the core-periphery model.

7.1 GBA Development with "Belt and Road"

The Belt and Road Policy and the GBA Integration Policy are closely linked. The Belt and Road is, first and foremost, a concentrated exhibition of China's reform and opening up and a manifestation of China's system and reform innovation. Second, the Belt and Road reflect China's ambitions to establish a new global order and a new model of major-country relations. As a result, the GBA is a key "Point" on the Belt and Road (Belt and Road official website, https://www.yidaiyilu.gov.cn/).

The GBA seems to benefit from being in the right place at the right time. The integration of the GBA has been incorporated into the national vision and action of promoting the construction of the Silk Road Economic Belt and the 21st-Century Maritime Silk Road at the

correct time. The GBA is concentrated on the Pearl River estuary area on the Mainland, facing the South China Sea, is located at a crossroads of international routes, is one of China's most developed locations, and serves as a link between China and countries along the Maritime Silk Road (Miao & Sun, 2020). Therefore, these two policies are highly complementary. The GBA is an essential link on the Belt and Road due to its geographical location and economic level. At the same time, the Belt and Road policy provides unprecedented opportunities and a bigger stage for GBA development.

Urban agglomeration has become increasingly essential as the world economy has gotten more globalized, and agglomeration of cities is usually more economically beneficial than fragmentation of cities. In Guangdong's regional development, the Hong Kong and Macao factor and their cooperation with Guangdong are of critical importance to Guangdong's economic development (Hong Kong Trade Development Council, HKTDC.com). GBA's growth has progressed from early regional economic cooperation to a comprehensive national development strategy. It has the potential to become a critical fulcrum for Guangdong's long-term development and provide favorable conditions for the change of the province's development model. Cooperation among GBA is not a new concept. The proposed construction of the GBA city cluster can be seen as an upgrade of the integrated development of the PRD cities, including Hong Kong and Macao (Ren, Li, & Chen, 2017). Each city can play different functions and roles in building this city cluster, creating a complementary effect. For example, some cities have a higher economic level, some have more vacant land, and some have a better ecological environment.

From an Asian perspective, the GBA is a hub for the north and south of Asia and a support point for the Chinese government's spillover benefits and radiation functions to Southeast and South Asian countries. According to the government's plan, under "One Belt, One Road", the GBA should develop closer to the "21st Century Maritime Silk Road" to achieve staggered competition with other regions. The GBA's location advantages can be highlighted in a focused manner. To promote a new round of regional economic development within the new growth space opened up by the Belt and Road policy.

7.2 GBA Development with "One Country, Two Systems"

The development model of GBA is particular and different from other Bay Areas in the world. The first particularity is "One Country" judging from the global experience. Economic and trade cooperation is mainly the cooperation between the country and the country, for example, the *North American Free Trade Agreement*. In contrast, the cooperation of GBA is regional cooperation within a sovereign country. The second particularity is "Two Systems" because the cooperative region faces the interconnection of two social systems, two legal systems, and two industrial standards. The third particularity is that the GBA has three independent customs regions. While an independent customs area in a sovereign country is shared, the GBA's collaboration is the cooperation of three independent customs regions inside a country. Although regional cooperation is within a country, the result is different from regional cooperation between mainland provinces, such as working in Guangdong and mainland provinces, because customs clearance is not an issue. The development of the GBA needs to be analyzed in the context of the "One Country, Two Systems," which is unique in the world and therefore has its specificity (One Country Two Systems Research Institute, http://www.octs.org.hk/).

Driven by years of synergistic development, Hong Kong has an inherent drive to strengthen its ties with the Mainland. In Hong Kong 2030: Planning Vision and Strategy, Hong Kong has identified strengthening its ties with the Mainland as one of the three strategic directions for future development. In the *Hong Kong 2030: Planning Vision and Strategy* ([《香港 2030+》：首頁（pland.gov.hk)](http://www.pland.gov.hk)), Hong Kong has identified strengthening its ties with the Mainland as one of the three strategic directions for future development. This strategy is also feasible according to the core-edge model. As the core within the GBA region, Hong Kong is attractive to the region. Promoting connectivity and cooperation between Hong Kong and other regions will contribute to better integration of the GBA region.

7.3 Challenges for GBA Development

The development of the Greater Bay Area will be complex and fraught with obstacles. First and foremost, it is the coordination and alignment of systems, especially the harmonization of one country, two systems, and three tariff zones. The GBA development plan is ambitious,

but it promises to yield great results. This master plan could aid in addressing the region's critical concerns due to its rapid economic development and urbanization. The cities concerned will need to re-formulate their development strategies and reinvigorate their economies to take advantage of the prospects created by the GBA development plan. Although the central government and its responsible ministries may be involved in developing and organizing an overall framework for GBA development, it will ultimately be up to local governments and the private sector to bring the plan to life.

The second issue is the region's unbalanced development. There are highly developed and high GDP cities like Hong Kong and Macao and economic prosperity and highly open mainland cities like Shenzhen. Nevertheless, many cities with average openness, like Huizhou, result in a significant gap in regional economic development. Bringing the great idea of a world-class GBA city cluster to life will be difficult. The ambitious development agenda outlined in this strategy is hazy on policy implementation details.

Furthermore, no enforcement mechanisms or time frames for meeting targets are mentioned (Lee & Lin, 2020). The GBA development plan has failed to give any measurable criteria for evaluating inter-city integration processes. As a result, the requirement to discuss and achieve mutual agreement on any recommendations for enhancing cross-border integration may make implementation more difficult.

Since Guangdong, Hong Kong, and Macao are all part of different administrative regions and customs zones, obtaining the level of collaboration and coordination required for the bay area's integrated growth will be difficult. The GBA consists of eleven cities, and is China's most complex and diversified city-cluster region, with extensive jurisdictional structures and sophisticated institutional frameworks (Xia & Zheng, 2019). Based on the economic radiation effect and Collaboration effects mentioned in the theory chapter, my opinion is that development at this stage should be balanced. The four core cities of Guangzhou, Shenzhen, Hong Kong, and Macao have highly developed economies and should continue to promote their development to drive the surrounding areas. At the same time, it is essential to ensure that the gap in development levels between the four core cities and the surrounding areas is not too significant. This will play an essential role in enhancing the overall competitiveness of the GBA and avoiding unhealthy inter-regional competition.

Modern cross-border infrastructure should be in place for the GBA development plan to work. Perhaps more crucially, many institutional barriers to the free movement of commodities and resources must be removed. According to the theory of agglomeration effects (Li & Wang, 2017), this is key. Communication between the four core cities and the surrounding areas needs to be more accessible. This is so that the peripheral cities can better provide the necessary services and supplies to the core cities and ensure the efficient functioning of the regional economies. More accessible infrastructure is an essential step in advancing regional integration, and improved accessibility can lead to closer inter-regional connections and smoother communication.

For Example, at any checkpoint within the GBA, travellers crossing the hard borders (Guangdong Province's borders with Hong Kong and Macao) may expect huge lines and a couple of hours of waiting time for immigration clearance. Before driving across the Hong Kong-Zhuhai-Macao Bridge, local drivers in Hong Kong must obtain three separate driving permits from the Guangdong, Hong Kong, and Macao authorities, purchase special car insurance for mainland China and Macao, and register their personal information in documents required by the Zhuhai Municipal government. Furthermore, it takes 12 working days to obtain all necessary government permits to cross this bridge (Financial Times, 2018). Such cumbersome procedures are bothersome for businesspeople, enterprises, and workers. The list of difficulties and inconveniences goes on and on, and these are undoubtedly obstacles to the process of economic integration.

Chapter 8. Conclusion

This thesis strengthens the idea that the Belt and Road policy and the GBA integration policy contribute to regional economic growth. The interest in this thesis initially arose from my personal interest in the GBA region and its portrayal as one. The most critical regions in the future development of China. An exploration of regional economic integration is the focus of this thesis. The development of urban agglomerations has led to regional integration in many aspects, including economy, politics, legal system, transport, and social governance. This thesis studies only the economic component of regional integration. In particular regions such as the Bay Area, integration and integration are crucial, which is significant for this thesis's research direction.

The research question of this thesis is the effect of Belt and Road Policy and GBA integration policy on regional economic growth. To answer the question, this thesis used the DID method. It developed an empirical model, using the quantitative analysis research method to collect government data and conduct an empirical analysis to obtain the final results. The empirical results show that GDP growth does exist in the GBA region following the introduction of these two policies. The findings provided a deeper insight into the GBA economic growth, although it may be foreshadowed that national and regional governments should deepen the implementation of these two policies. The feasibility of the policies has been initially verified, and the next possibility is to develop a more in-depth and practical detailed strategy.

The contribution of the findings of this thesis is reflected in the following three aspects: firstly, this thesis discusses the mechanism of the impact of GBA integration policies on the economic growth of the region in the light of regional economic theory. Secondly, based on the construction of the Guangdong-Hong Kong-Macao Greater Bay Area, this paper empirically demonstrates the driving effect of the Bay Area economic integration policy on regional economic growth using the DID model. Finally, this thesis reveals the problems behind the construction of the GBA by exploring the impact mechanism of the construction of the Guangdong-Hong Kong-Macao Greater Bay Area and the Belt and Road policy to drive the economic growth of the GBA region, which provides a theoretical basis for promoting the full release of the policy dividend by accelerating the transformation and upgrading of the industrial and consumption structures.

The research questions are primarily addressed, but there is still room for improvement. One limitation is that I have used GDP growth only as an indicator for judging economic growth. Only GDP data was also collected in the empirical analysis. This can be interpreted as one-sided, as economic development is multidimensional, and more factors should be considered. In addition to GDP growth, the efficiency and quality of economic development should also be taken into account. For future studies, the use of more dimensional data in the empirical analysis would be more exhaustive.

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