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Innovation Across Borders: The Policy Framework Shaping Hong Kong-Shenzhen Cooperation

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Abstract: This study investigates the role of public policy in shaping the innovation cooperation between Shenzhen and Hong Kong, with a particular focus on science and technology innovation (STI). Despite being part of the same country, the two regions operate under distinct political, economic, and regulatory systems, resulting in differing approaches to innovation. This paper explores how these policy differences affect the relationship between government and businesses, particularly regarding cross-border innovation collaboration. By analysing key policies in areas such as research and development, talent admission, enterprise competitiveness, and startup development, the study highlights the challenges and opportunities arising from these disparities. The paper argues that although the regions face institutional and cultural barriers, there is considerable potential for policy synergies to overcome these challenges and enhance STI collaboration. Ultimately, the study proposes strategies for fostering stronger cooperation between Shenzhen and Hong Kong, contributing to the overall growth of the Guangdong-Hong Kong-Macao Greater Bay Area's innovation and economic development.

Keywords: Hong Kong-Shenzhen region, technological innovation, cross-border cooperation, cross-border regional innovation systems, qualitative research

1. Introduction

Shenzhen and Hong Kong, as part of the Guangdong-Hong Kong-Macao Greater Bay Area (GBA), are important for global economic development and science, technology, and innovation (STI). Even though they are in the same country, Shenzhen and Hong Kong still have a lot of difficulties working together on STIs under the "One Country, Two Systems" framework. This is because the two regions' innovation ecosystems differ due to their different political, economic, and regulatory settings. This article examines, from the perspective of public policy, how Shenzhen and Hong Kong have different policies on cross-border innovation cooperation as a result of the different relationships between governments and businesses.

Through analysing the differences in Shenzhen and Hong Kong's public policies, particularly regarding innovation cooperation, this paper seeks to shed light on how local business collaboration, talent acquisition, and innovation ecosystems are impacted by government policies. Additionally, it explores the potential for synergies that could help overcome cross-border challenges.

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2. The Policy Framework Shaping Hong Kong-Shenzhen Cooperation

China's business environment is significantly shaped by the state, particularly when it comes to innovation [1]. Through direct legislation, financial incentives, and state-led research initiatives, the state actively participates in innovation [2]. The public policy frameworks in Shenzhen and Hong Kong, however, represent distinct strategies for local government participation in the innovation process under the "One Country, Two Systems" framework.

The government of Shenzhen promotes STI through strategic initiatives, financial support, and direct industrial support, resulting in more direct policies. Examples include industrial policy guidelines for new fields including biotechnology, green technology, and artificial intelligence [2] [3].

Hong Kong, on the other hand, fosters innovation more by establishing an atmosphere that encourages private sector development and follows a more market-oriented policy with less government involvement [4]. In Hong Kong, innovation is more dependent on market forces, even if the government still provides significant funding and infrastructure [5].

2.1. Policy Impacts on Businesses Innovation

2.1.1. Effects on Shenzhen businesses

The goal of Shenzhen's innovation policy is to encourage quick industrial growth and technological advancement. Through tax reductions, financial incentives, and state-funded R&D initiatives, the government offers support to businesses. With fewer business risks and greater financial support, Shenzhen's state-led model allows businesses to expand quickly in a favourable policy environment [2]. However, this state-led approach might also cause businesses to rely too much on government assistance, which would restrict their capacity for autonomous innovation.

2.1.2. Effects on Hong Kong businesses

The innovation policy of Hong Kong is primarily focused on the market. Businesses typically have to drive innovation on their own, even while the government offers the essential financial support and policy framework. Since Hong Kong's legal and financial framework gives businesses more independence, it draws many foreign businesses and fosters a very competitive business environment. However, Hong Kong's low level of government involvement also makes it more difficult for businesses to get government assistance and overcome regulatory obstacles [6].

2.2. Shenzhen and Hong Kong's Policies Differ in Science, Technology, and Innovation

According to this paper's overview and analysis of the major STI policies currently in place, Shenzhen and Hong Kong differ primarily in their approaches to technological innovation, talent admission, enterprise competitiveness, and start-up support [7].

First, about STI research and development policies, Hong Kong's policies, which are based on the Hong Kong Innovation and Technology Fund funding scheme and published the Hong Kong Innovation and Technology Development Blueprint in 2022, place a strong emphasis on technological innovation, applied science and technology research, and university research funding. On the other hand, Shenzhen encourages funding for applied science and technology research as well as technological innovation through policies like the Shenzhen Research Integrity Management Measures (Trail) in 2020 and the Shenzhen Science and Technology Research and Development Funding Management Measures in 2019. The main distinction between these strategies is found in

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the goals of scientific and technical innovation as well as the purposes that the research funding is directed towards.

Second, Hong Kong's talent admission regulations continue to be implemented through initiatives including the Hong Kong Research Talent Pool Program and the Admission of Talents Policy Scheme for Outstanding, High-end, and Skilled Talents. In contrast, Shenzhen offers financial incentives and support for entrepreneurs through programs like the 2020 Measures for the Overseas Students' Entrepreneurship Subsidy and the 2020 Talents Settlement Measures in Shenzhen. The primary distinctions are seen in the methods used to control talent mobility and attract talent.

Thirdly, Hong Kong's policies, such as the Hong Kong Competition Ordinance and Small and Medium Enterprises (2019), emphasise the development and funding of enterprise competitiveness and skill upgrading initiatives. In contrast, Shenzhen promotes enterprise competitiveness and the growth of small and medium-sized businesses through initiatives like the Shenzhen Work Programme for Optimising Market-based Business Environment 2023-2025 (2023) and the Action Plan for Science and Technology Innovation in the Advance Demonstration Zone of Socialism with Chinese Characteristics (2020). The two locations' business environments differ in several ways, notably in terms of legal and cultural norms, technical standards, and financial support.

Finally, when it comes to policies that support the development of startups, Hong Kong encourages youth startup programs and startup incubation through programs like the Hong Kong University Technology Start-up Fund, which was established in 2014, and the government's support for innovation and technology (startups). However, with a focus on returnees and entrepreneurial efforts, Shenzhen encourages entrepreneurial activity through policies such as the Shenzhen Science and Technology Business Incubator and Creative Space Management Measures (2021) and the Shenzhen Entrepreneurship Project Management Measures (2020). The primary differences apply to the financial sources and the areas of prioritise for support.

This study summarises and analyses 119 science and innovation-related policies in Shenzhen and 124 science-and innovation-related policies in Hong Kong between 2013 and 2024 based on the body of existing literature and policy documents. It additionally presents an overview of the key fundamental policies and policy changes over the last five years, as indicated in Appendix Figure 1. A Summary of Policies Regarding Cross-Border Collaboration in STI and The Synergistic Development Between Shenzhen And Hong Kong.

2.3. Practice Differences in Science, Technology and Innovation Cooperation

There are clear distinctions in STI practices between Shenzhen and Hong Kong, even though both cities are actively fostering cross-border STI cooperation. In Shenzhen, large businesses dominate innovation and patenting activities, with limited involvement from universities, while in Hong Kong, academic institutions play a central role in basic research and innovation.

Large businesses in particular play a significant role in patenting and technological innovation in Shenzhen's enterprise-led innovation model, with universities and other higher education institutions having a comparatively little role. The Natural Science Fund, which finances programs like basic research projects, higher education institutions, and soft science projects, makes up just 12.7% of the 13,498.3 million Yuan budget for the Shenzhen Municipal Bureau of Science, Technology, and Innovation (SZBSTI) in 2024. In contrast, universities and research institutes in Hong Kong are primarily in charge of basic research, particularly when it comes to creative scientific research, where academia has a bigger influence.

Although there has been some cooperation between the two locations in science and technology innovation through forms of cooperation like co-publishing papers, applying for patents, and building joint laboratories [8], the depth and breadth of cooperation is still limited [9]. Hong Kong's industrial innovation is less active, with small businesses providing the innovation base of local industries and

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lacking industry-driven innovation mechanisms [10]. In contrast, Shenzhen firms have been more active in promoting cross-border linkages, using cross-border university resources, and attracting cross-border financial capital [9] [11] [12].

Inequality also exists in Shenzhen and Hong Kong's innovative cooperation. Cross-border cooperation is more advantageous for Shenzhen businesses, particularly when it comes to financial support and technological transfer. There is an imbalance in STI cooperation between the two locations since Hong Kong, on the other hand, depends more on academic cooperation and lacks a strong enough industrial innovation foundation [11].

2.4. The Difficulties and Possibilities of Shenzhen and Hong Kong's Cross-Border Cooperation in STI

The innovative cooperation between Shenzhen and Hong Kong is an iconic instance of how government policies have a profound effect on local economic development. This effect has a significant impact on how businesses innovate and develop in addition to being reflected in the creation and application of local policy. In the above, I analysed the differences between Shenzhen and Hong Kong policies, which have resulted in a variety of local development paths and business performances, from the views of STI.

Cross-border innovation cooperation continues to be significantly constrained by institutional and cultural disparities between the two regions. For instance, Shenzhen and Hong Kong's different legal systems, social norms, and industrial structures frequently result in an unequal distribution of the advantages of cooperation, which makes it challenging for some cooperation projects to provide the intended outcomes.

However, this paper also recognises the potential for policy synergies based on the aggregated analysis of policies. Both Shenzhen and Hong Kong acknowledge the enormous potential of cross-border cooperation in boosting innovative capabilities, regardless of differences in their respective innovation policies and practices. Shenzhen and Hong Kong can compensate for their deficiencies in innovation resources, technology transfer, and talent mobility in the future by enhancing policy coordination and cooperative governance frameworks. This will also encourage the two regions to develop STIs in a mutually beneficial way.

2.4.1. Challenges of Cross-Border Innovation Cooperation

1. Differences in regulations and policy: The absence of coordination of policies between Shenzhen and Hong Kong is one of the primary challenges to cross-border innovation cooperation. Hong Kong has more market-oriented policies with less government involvement than Shenzhen, which has more state-led and industry-oriented policies. These distinctions cause conflict in areas including funding mechanisms, regulatory compliance, and intellectual property rights. Incompatible policies might make it difficult for businesses to collaborate across borders and reduce the efficiency of that collaboration.

2. Institutional and cultural barriers: Despite being close by, Shenzhen and Hong Kong differ greatly in terms of their institutions and cultures. Whereas Hong Kong has more market-driven policies with less government involvement, Shenzhen's commercial environment is impacted by a more centralised, state-led model. These cultural disparities can cause miscommunications and make cross-border cooperation challenging, especially when it comes to company management and decision-making.

3. Concerns about intellectual property: One of the main challenges to cross-border innovation cooperation remains the defence of intellectual property. Even though Shenzhen and Hong Kong have both improved intellectual property protection to some extent, enterprises may be hesitant to share

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innovations and knowledge in cross-border cooperation due to the disparities in their legal systems and compliance practices. Coordinating intellectual property laws and strengthening compliance systems in both regions would help overcome this challenge and build confidence.

4. Competition and imbalanced distribution of power: Another major challenge to cross-border innovation cooperation is the growing economic and technological competition between Shenzhen and Hong Kong. Shenzhen is a leader in many high-tech industries due to strong governmental support and quick advancements in technology, while Hong Kong is active in more conventional sectors like finance and real estate and remains comparatively behind in terms of innovative development. An imbalance of power in cooperation could result from this imbalance of capacities, which could compromise equality of cooperation and restrict growth and innovation in both directions.

2.4.2. Possibility of Innovation Cooperation

1. Making utilisation of complimentary abilities: Shenzhen performs well at manufacturing, technology development, and supporting large-scale innovation, especially in fields like biotechnology, artificial intelligence, and telecommunications. In contrast, Hong Kong features an advanced financial system, a robust intellectual property protection framework, and an international business ecosystem. Shenzhen and Hong Kong can create a closer innovation environment by utilising their complementary capabilities, with Shenzhen offering the industrial and technological foundation and Hong Kong giving access to global markets and funding.

2. The talent pool's expansion: One of the main forces for cross-border innovation cooperation may be the talent migration between Shenzhen and Hong Kong. Shenzhen has a thriving environment for innovation and entrepreneurship, while Hong Kong's universities are well known for their research capacity. The two locations can bring together elite individuals to collaboratively drive corporate development and technical innovation by promoting talent mobility. A more inventive and cooperative environment can be promoted by encouraging communication and cooperation between researchers, business executives, and entrepreneurs.

3. Growth of the Market: By combining their respective research and development, infrastructure, and international networks, Shenzhen and Hong Kong can operate as gateways to the Chinese and international markets, drawing in foreign investment and establishing world-class innovation hubs. The development of new business models to satisfy the demands of both domestic and foreign markets can be boosted by the combination of Shenzhen's creative industries and Hong Kong's experience with global financial markets.

3. Conclusion

From the perspective of public policy, the policy distinctions between Shenzhen and Hong Kong about STI collaboration have a direct effect on the two regions' distinct innovation ecosystems. Even while the two cities differ significantly in terms of enterprise assistance, talent entrance, and innovation funding, there is still a great deal of potential for innovative collaboration between regions. Future developments could enhance policy synergies, promote technology and innovation cooperation between the two regions, and coordinate cooperation under disparate institutional and cultural contexts between Shenzhen and Hong Kong. Through mechanism innovation and policy synergies, it is expected that Shenzhen and Hong Kong will achieve stronger cross-border collaboration and provide new energy to the Guangdong-Hong Kong-Macao Greater Bay Area's scientific and technology innovation as well as economic development.

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Appendix

Table 1: A Summary of Policies Regarding Cross-Border Collaboration in STI and The Synergistic Development Between Shenzhen and Hong Kong.

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Main Aspect	Objective for Collaborative Development	City	Key Focus	Specific Policies	Key Policy Differences	Administrative Challenges to be Addressed by Policy Synergy
Scientific and Technological Innovation Research and Development	Establishment of a unified platform	Hong Kong	1. Applied scientific and technological research and innovation; 2. Innovation development institutions; 3. University research funding.	Hong Kong Innovation and Technology Venture Fund since 2017 [13]	1. Whether research funding is mainly for universities or industry; 2. Whether technological innovation is for social welfare or enterprises competition.	1. Differences in project execution and management across institutions, including cross-border operations and project administration, such as application, assessemnt and evaluation, completion and acceptance, tech transfer and research finding transforamtion, and research integrity; 2. Differences in cross-border project funding application, usage and management; 3. Cross-border large scientific equipments usage, tax exemption, and sharing system marketisation issues; 4. Data across borders issues.
				Scientific Research Integrity Guidelines in Hong Kong 2019 [14]		
				Hong Kong Innovation and Technology Development Blueprint 2022 [15]		
				Large Scientific Equipment Sharing List 2022 [16]		
		Shenzhen	Funding and Applied Science Research and Technology Innovation Support	Measures for the Administration of Shenzhen Science and Technology R&D Funds 2019 [17]		
				Shenzhen Scientific Research Integrity Management Measures (Trial) 2020 [18]		
				Rules for Assessment, Evaluation and Funding of Open and Shared Services of Large Scientific Research Instruments in Shenzhen City 2023 [19]		
				Funding of Technology Transfer and Research Finding Transformation Projects in Shenzhen 2023 [20]		
				Catalogue of Currently Valid Normative Documents of Shenzhen Science and Technology Innovation Commission 2023 [21]		

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Table 1: (continued)

Talent Admission	Promote talent mobility	Hong Kong	Talent admission schemes	Hong Kong's Outstanding/High-end/Technical Talent Admission Schemes [22]	1. Whether talent attraction is based on visa programs or financial incentives; 2. Whether talent mobility is controlled.	1. Freedom of talent mobility across the borders, especially for those working on collaborative projects in the Lok Ma Chau Loop Innovation and Technology Park in Shenzhen; 2. The issue of restrictions on the place of affiliation of project leaders; 3. The issue of support for transport and accommodation of talents.
				Hong Kong Research Talent Pool Program [23]		
		Shenzhen	Financial incentives for overseas returnees and entrepreneurial activities	Shenzhen Measures to Promote Talent Development 2016 [24]		
				Shenzhen Talents Settlement Measures 2020 [25]		
				Shenzhen's Overses Educated Personnel Entrepreneurship Subsidy Scheme 2022[26]		
				Shenzhen Measures for High-level Talent Subsidies 2023 [27]		
Enterprise Competitiveness Promotion	Encourage close interaction among enterprises and foster economic, social, and institutional integration	Hong Kong	1. Enterprise competitiveness and skills development; 2. Financial programs.	Hong Kong Competition Ordinance 2015 [28]	Whether specific industries are supported.	The issue of differences in the business environment, which includes 1. Differences in culture and legal systems (attractiveness to international businesses); 2. Differences in industry technical standards and infrastructure (whether they are in line with international standards and whether they serve international markets); 3. Differences in financial support (national government subsidies or financial ecosystems that rely on international capital markets)
				Hong Kong Competition Ordinance and SMEs 2019 [29]		
		Shenzhen	Enterprise competitiveness (technical for large companies and non-technical for SMEs)	Decision on Promoting the Sustainable and Rapid Development of High-tech Industries in Shenzhen 2004 [30]		
				Shenzhen Measures to Support Enterprise Competitiveness 2016 [31]		
				Shenzhen SME Development Promotion Ordinance 2010 [32]		
				Shenzhen's Action Plan for Science and Technology Innovation in the Advance Demonstration Zone of Socialism with Chinese Characteristics 2020 [33]		
				Shenzhen Measures for Supporting SMEs' Relief and High-Quality Development 2023 [34]		
				Shenzhen's Work Programme for Optimising Market-based Business Environment (2023-2025) 2023 [35]		
Startup Development Support	Promote cross-border collaboration of startups	Hong Kong	1. Incubation support for startups; 2. Internship programs for young startups.	Hong Kong Technology Start-up Support Scheme for Universities (since 2014) [36]	Whether social innovation and entrepreneurship are supported.	How to establish academic-driven startups to realise the commercialization of research outcomes.
				Hong Kong Innovation and Technology Venture Fund since 2017 [13]		
				Hong Kong's Startup Incubation and Accelerator Programs and Support Resources 2024 [37]		
		Shenzhen	Financial incentives for overseas returnees and entrepreneurial activities	Measures for the Management of Entrepreneurial Projects in Shenzhen 2020 [38]		
				Shenzhen Science And Technology Business Incubator And Creative Space Management Measures 2021 [39]		
				Shenzhen's Overses Educated Personnel Entrepreneurship Subsidy Scheme 2022 [26]		
				Shenzhen 2023 Call for Applications for Overseas Returnees Entrepreneurship Support [40]		