

Thought Leadership Brief Series

Specialisation of Manufacturing Industries in the Guangdong-Hong Kong-Macau Greater Bay Area

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HIGHLIGHTS

- Addresses the lack of recent studies enabling systematic, comparable analysis of industrial specialisation across Chinese regions.
- Identifies specialised industries for each of the nine Guangdong cities in the Guangdong-Hong Kong Macau Greater Bay Area (GBA) and for 31 Chinese provinces.
- Each city in the GBA exhibits a distinct pattern of specialised industries, shaped by its unique industrial legacy and policy orientation, and together they contribute to a dynamic regional division of labour.
- Compared to the Yangtze River Delta (YRD), the GBA stands out for its specialisation in consumer-oriented industries that are moderately tech- and capital-intensive, with a strong emphasis on product design and rapid response to shifting market demand. This reflects the region's deep industrial roots as China's pioneering export-oriented economy since the onset of reform and opening-up.
- GBA specifically leads in one high-tech industry—the ICT equipment—accounting for over one-third of national sales, far exceeding Jiangsu's 15% share (ranking second after Guangdong) and the YRD's combined 28% share.
- Lays a foundation for further research on the GBA's industrial dynamics, informing better regional and industrial policies.

In many industries, leading firms are located in the same nation—or even the same city or region within the nation, as Porter and others proved.¹ The localisation of competitive advantage in certain industries

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and activities has prompted national and local governments to pursue industry-proliferating regional development policies. However, Michael Enright warns that without rigorous methods to identify and characterise industrial localisation, regional policies risk targeting the same industries across different places, rather than supporting strategies tailored to the specific nature of local economies.²

The Guangdong-Hong Kong-Macau Greater Bay Area (GBA) has been a key driver of China's economic growth since China's reform and opening-up. Many scholars have examined various aspects of GBA industrial development, such as development trajectories, technological upgrading, innovation, and industrial interconnection, using advanced techniques and detailed historical materials.³ However, few of these studies use disaggregated industrial data to identify industrial agglomerations or specialisations within the GBA that enable systematic cross-regional comparisons.

This analysis addresses this gap in recent studies by applying a simple yet powerful tool—location quotient analysis—to identify the industrial specialisation in the Pearl River Delta (PRD), the Guangdong portion of the GBA, and the region as a whole, especially as compared with the Yangtze River Delta (YRD), another major economic powerhouse of China.

Location quotient (LQ) is a widely used tool in economic geography that compares a region's share of a specific activity with its share of a broad aggregate.⁴ Using LQ instead of the more widely known 'market share' as the primary metric is because market share tends to bias against smaller economies or industries, limiting comparability across regions or sectors of different scales. Its threshold for specialisation is also arbitrary. Relying solely on market share to measure specialisation or competitiveness may, therefore, result in a few geographic units dominate most industries, or certain industries appear dominant across all geographic units. In contrast, LQ offers a more nuanced view, allowing finer differentiation of industrial specialisation among regions.

Identify Industrial Localisation

Using the latest available industrial output data across 31 manufacturing industries at the city, provincial, and national levels, the study first calculates location quotients for each of the nine PRD cities by dividing an industry's share in the city's gross industrial output (GIO) by the same industry's share in Guangdong's total GIO. Provincial-level location quotients are then computed by dividing each industry's share in provincial industrial sales by its corresponding share in the national total. An LQ greater than one indicates that a city or region is more specialised in an industry than the provincial or national average, with higher LQ values reflecting greater specialisation.⁵ By combining LQs with industrial output shares, the study analyses the specific industrial competitiveness of PRD cities within the regional context, and of the GBA within the national context.

The data used to calculate the LQs for PRD cities are the GIO of industrial enterprises above designated size in 41 secondary industries (including seven mining industries, 31 manufacturing industries, and three utility industries) in nine PRD cities in 2023. An industrial enterprise above designated size refers to one with an annual principal business revenue of RMB 20 million or above. The data used to calculate the LQs for Chinese provinces are the sales revenues of industrial enterprise above designated size in 31 manufacturing industries across 31 Chinese provinces in 2022. Since the PRD region generally accounts for over 80 percent of Guangdong's industrial output, the LQs for Guangdong province are used to represent those of the PRD and thus, the GBA. For the YRD, the analysis first sums the sales revenues of Shanghai, Jiangsu, Zhejiang, and Anhui provinces for each of the 31 manufacturing industries. The aggregated industry-level revenues are then used to compute the LQs for the YRD.

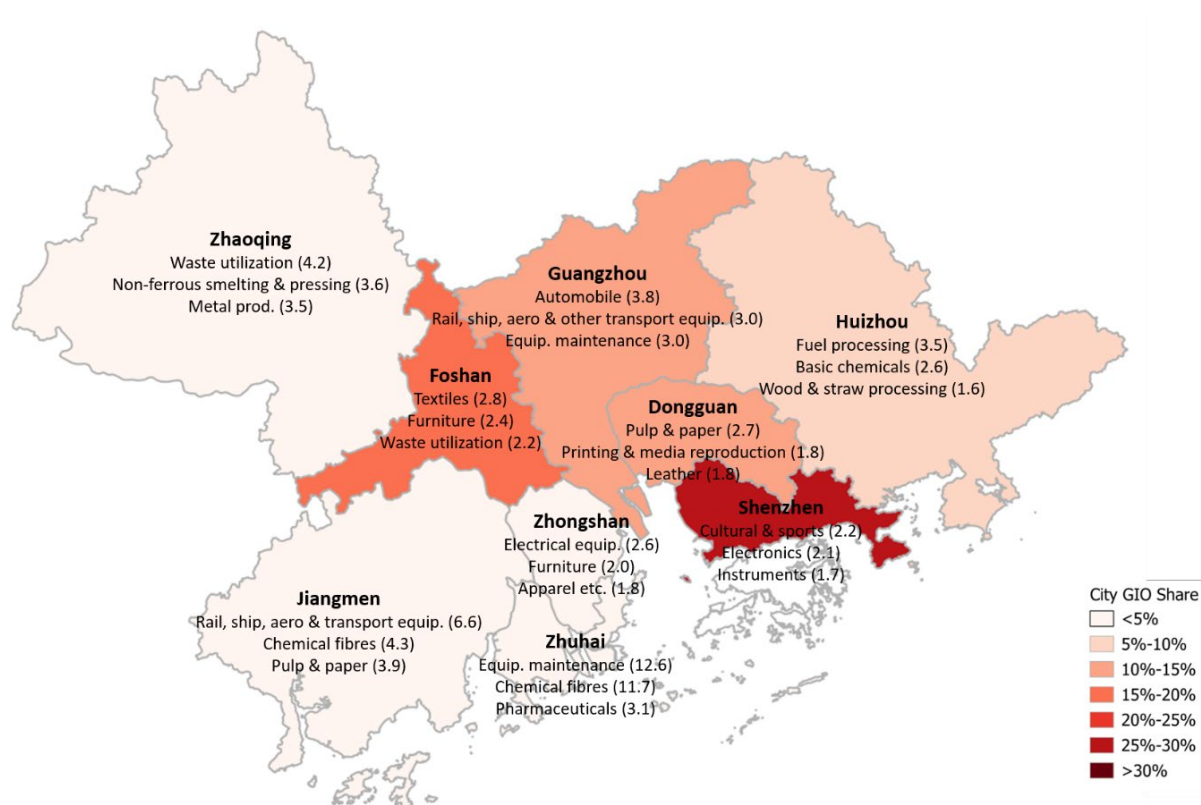
Industrial Specialisation in PRD Cities

Using the LQs as a benchmark, each of the nine cities in the PRD exhibits distinct industrial strengths, enabling us to uncover a multifaceted economic landscape characterised by high-tech innovation, traditional manufacturing, and resource-based processing. Figure 1

illustrates the distribution of industrial specialisation across the PRD region, as represented by the top three industries with the highest LQs in each city. The author's working paper of the same title offers an in-depth analysis of all specialised industries in these cities.⁶

By combining location quotients with each city's industrial output shares in the province, the study identifies Guangzhou and Shenzhen as the undisputed industrial leaders in the GBA. Guangzhou excels in transport equipment and pharmaceutical manufacturing, while Shenzhen stands out in electronics, instruments, and creative industries.

Figure 1. Industrial Specialisation Pattern of the PRD Region



Notes: Numbers in parentheses represent LQs. Only the top three specialised manufacturing industries with the highest LQs in each PRD city are shown on the map. "Other manufacturing" and "Tobacco manufacturing" are excluded in the map. City GIO Share indicates the proportion of a PRD city's GIO within the provincial total GIO.

Foshan, Dongguan, and Zhuhai form the second tier of industrial strength in the PRD. Foshan is another manufacturing powerhouse in Guangdong, dominating in a wide range of traditional industries, spanning from textiles, furniture, and metal products to electrical and

general equipment, supported by ongoing smart transformation.

Compared to Foshan, Dongguan has a smaller provincial market share and narrower industry range but leverages its export-oriented legacy and proximity to Shenzhen to thrive in traditional sectors like paper and leather goods while increasingly advancing in high-tech industries like electronics. Zhuhai stands out for its unique specialisation in aerospace maintenance, driven by strategic advantages such as Airshow China and efficient connectivity to the Hong Kong International Airport. It is also a key contributor to Guangdong's chemical and pharmaceutical industries.

The remaining cities may not hold substantial provincial shares in most of their specialised industries compared to the leading ones, but they each exhibit distinctive strengths in specific sectors. Huizhou and Jiangmen contribute strategically to Guangdong's capital-intensive sectors. Huizhou serves as a petrochemical hub anchored by the Daya Bay complex, while Jiangmen excels in railway, ship, aeronautics and other transport equipment, as well as chemical production. Zhongshan's industrial specialisation profile is similar to those of Foshan and Dongguan, but its share in provincial output for each specialised industry is significantly lower. It may need to consolidate its industrial focus and scale up industrial output, alongside continued efforts in industrial upgrading. Zhaoqing plays an important upstream role, specialising in resource-based processing and production, and is increasingly recognised for its contributions to waste utilisation, highlighting its potential in circular economy practices.

Collectively, the PRD cities form a dynamic complementary and resilient industrial ecosystem, blending traditional capabilities with advanced and sustainable manufacturing potential.

Industrial Specialisation of GBA in China

LQs based on industrial sales revenue across 31 Chinese provinces indicate that the GBA (represented by Guangdong province) specialises in 12 out of 31 manufacturing industries. It is most highly specialised in five ($LQ > 1.5$): cultural & sports goods, furniture, ICT equipment (communication equipment, computers and other electronic equipment), rubber and plastics, and other manufacturing. To a lesser extent, the

GBA also shows specialisation in electrical equipment, printing & media reproduction, apparel, footwear & headgear, pulp & paper production, leather products, metal products, and instruments & meters (See Table 1).

Table 1. Industrial Specialisation in the GBA vs the YRD

GBA (Guangdong)			YRD		
Industry	LQ	National Share	Industry	LQ	National Share
Cultural & sports goods	2.172	32%	Chemical fibres	2.285	68%
Furniture	2.146	31%	Instruments & meters	1.721	51%
ICT equipment	2.094	31%	General equipment	1.720	51%
Rubber & plastics	1.528	22%	Electrical equipment	1.508	45%
Other manufacturing	1.525	22%	Textiles	1.495	44%
Electrical equipment	1.429	21%	Special equipment	1.299	38%
Printing & media reproduction	1.394	20%	Rubber & plastics	1.283	38%
Apparel, footwear & headgear	1.345	20%	Apparel, footwear & headgear	1.273	38%
Pulp & paper production	1.292	19%	Metal products	1.208	36%
Leather products	1.270	19%	Automotive manufacturing	1.106	33%
Metal products	1.269	19%	Cultural & sports goods	1.105	33%
Instruments & meters	1.115	16%	Basic chemicals	1.083	32%
			Printing & media reproduction	1.078	32%
			Furniture	1.047	31%
			Railway, ship, aero etc. equip.	1.038	31%

The GBA is frequently compared with the YRD region. However, caution is needed as the YRD covers a substantially larger area and population, which gives the region a significantly larger economy. The YRD officially includes 27 prefecture-level cities in four provinces (Shanghai, Jiangsu, Zhejiang, and Anhui), with a total land area of 358,000 square kilometres.⁷ In contrast, the GBA includes only 11 cities with a total land

area of 56,000 square kilometres. The YRD has a population of 240 million, while the GBA has only 86 million.

Despite these differences, the LQ method offers a better tool for comparing the industrial strength of the two regions. As shown in Table 1, the YRD specialises in 15 out of the 31 manufacturing industries and is also most highly specialised in five: chemical fibres, instruments and meters, general equipment, electrical equipment, and textiles. To a lesser extent, it also shows moderate specialisation in a broader range of industries.

Industries specialised in the YRD but not in the GBA include chemical fibres, general equipment, textiles, special equipment, automotive manufacturing, basic chemicals, and railway, ship, aeronautics and other equipment. Conversely, industries specialised in the GBA but not in the YRD include ICT equipment, other manufacturing, pulp & paper production, and leather products.

While a broad-based manufacturing powerhouse, the GBA's specialisation profile, especially in comparison with the YRD, highlights GBA's competitive edge in consumer-oriented sectors (electronics, household goods, cultural and sports, apparels), mid-tech, moderate-capital industries (rubber & plastics, electrical equipment, printing & media reproduction), and design-intensive industries (cultural & sports products and furniture). These industries have a high demand for flexible, agile manufacturing to respond rapidly to market shifts.

An exception is the ICT equipment industry in the GBA, which delivers high value-added output and advanced technological content. It also requires substantial upfront investment and highly skilled labour. Remarkably, the GBA accounts for over one-third of national sales in this industry, far exceeding Jiangsu's 15% share (ranking second after Guangdong) and the YRD's combined 28% share, underscoring the region's leading competitiveness in this high-tech industry as here concentrated nearly all China's ICT giants.

In contrast, the YRD's specialisation profile reveals a robust foundation in capital- and technology-intensive upstream industries, distinguished by precision manufacturing, advanced engineering, and a strong demand for skilled labour.

Conclusion

The LQ analysis offers a nuanced perspective on the manufacturing competitiveness of the GBA and its cities, allowing for a finer differentiation of industrial specialisation despite central and local economic plans seemingly targeting similar priority industries. This study highlights that a region's industrial strength and development trajectory stem from a synergy of public policies, local industrial heritage, and resource endowments. PRD cities exhibit a dynamic division of labour and industrial complementarity, enabling refined coordination and integration for mutual reinforcement.

However, without disaggregated sectoral data, this study cannot fully explore the industrial strength of cities and provinces at a more refined level, neither can it address the role of innovation in reshaping the GBA's industrial landscape, or how Hong Kong's strengths in services and science can be leveraged for regional development. These are important areas for future research, with this study serving as a foundational step in understanding the GBA's industrial dynamics.

¹Porter, M.E., 1990. The Competitive Advantage of Nations. *Harvard Business Review*, 68(2), pp.73–93.

Storper, M., 1992. The Limits to Globalisation: Technology Districts and International Trade. *Economic Geography*, 68, pp.60–96.

Enright, M.J., 1996. Regional Clusters and Economic Development: A Research Agenda. In: Staber, U.H., Schaefer, N.V. and Sharma, B. (eds), *Business Networks: Prospects for Regional Development*. Berlin: Walter de Gruyter, pp.190–213.

²Enright, M.J., 2000. The Globalisation of Competition and the Localisation of Competitive Advantage: Policies towards Regional Clustering. In: Hood, N. and Young, S. (eds), *The Globalisation of Multinational Enterprise Activity and Economic Development*. London: Palgrave Macmillan

³Feng, Z., Cai, H. and Zhou, W., 2020. Structural Characteristics and Spatial Patterns of the Technology Transfer Network in the Guangdong–Hong Kong–Macao Greater Bay Area. *Sustainability*, 12(6), p.2204. Available at: <https://www.mdpi.com/2071-1050/12/6/2204>.

Li, S., Du, Y. and Jiao, P., 2022. On the Industrial Division and Coordinated Development in the Guangdong–Hong Kong–Macao Greater Bay Area. *Contemporary Social Sciences*, 6, pp.19–36.

Li, X., Tan, Y. and Xue, D., 2022. From World Factory to Global City-Region: The Dynamics of Manufacturing in the Pearl River Delta and Its Spatial Pattern in the 21st Century. *Land*, 11(5), p.625. Available at: <https://www.mdpi.com/2073-445X/11/5/625>.

Li, Z., Han, Z. and Han, F., 2025. Coordinated Economic Development in the Guangdong-Hong Kong-Macao Greater Bay Area: R/S Fractal Analysis. *International Advances in Economic Research*, 31, pp.15–43.

Patchell, J., 2024. Clusters and Regional Coordination. In: *China's Greater Bay Area: Agglomeration, External Economies, Governance and Urbanisation*. Routledge, pp.71–100.

Tang, J., Guo, W. and Fang, Y., 2024. *The Hard Truth of the New Era: Guangdong's Search for the Path to High-Quality Development* (新时代硬道理：广东寻路高质量发展). Guangdong People's Publishing House.

⁴Isard, W., 1960. *Methods of Regional Analysis: An Introduction to Regional Science*. Cambridge, Massachusetts: The M.I.T. Press

⁵Chapman, S., 2017. The Spatial Distribution of Industries in Great Britain: 2015. Office for National Statistics. Available at: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/thespatialdistributionofindustriesingreatbritain/2015>

⁶Zhang, S.Z., 2025. Specialisation of Manufacturing Industries in the Guangdong-Hong Kong-Macao Greater Bay Area—A Location Quotient Approach. *Working paper*. SSRN. Available at: <https://ssrn.com/abstract=5657991> or <http://dx.doi.org/10.2139/ssrn.5657991>.

⁷State Council, People's Republic of China, 2019. Outline of the Yangtze River Delta Regional Integrated Development Plan. *State Council Gazette*, no.35. Available at: https://www.gov.cn/gongbao/content/2019/content_5462503.htm.

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About the Author

Dr. Sophie Zhang combines a rigorous academic background in economics with more than a decade of strategic consulting experience. She returned to academia last year to advance research on industrial, urban, and regional development in China, as well as global supply chain dynamics. Previously, she spent 11 years advising governmental departments and agencies in HKSAR and the Chinese mainland, as well as multinational corporations investing in China. Her consulting work involved comprehensive studies on industrial structure, economic trends, urban planning, and transport infrastructure across a wide range of Chinese cities— from less developed inland prefectures to advanced coastal metropolises. This dual perspective enables her to integrate theoretical insights with practical solutions, offering a unique understanding of both academic and real-world challenges.

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