The Nexus Between Industry 4.0 and Financial Services in the GBA

by

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1. Background and Definition of Industry 4.0

1.1. The Industry 4.0 movement emerged in Germany and is a national strategy for the country. In April 2013, Germany announced for the first time at the Hannover Messe that it had officially incorporated its "Industry 4.0" strategy into its "German High-Tech Innovation Strategy 2020". The essence of Industry 4.0 is to use cyber-physical systems (CPS) to promote the intelligent transformation of the manufacturing industry. Through this transformation, all links of the industrial chain are connected to achieve a high degree of integration of material flow, information flow, and capital flow. As a result, the integration enhances operational efficiency and increases the competitiveness of the manufacturing industry. German companies with transformation advantages include BASF, Bosch, Daimler, Deutsche Telekom, and Trumpf.

1.2. At the heart of Industry 4.0 lies the concept of a smart factory, where machines are equipped with network connectivity and connected to a system that can visualize the entire production chain. This system is empowered to make decisions autonomously based on artificial intelligence, thereby enabling the factory to operate with greater efficiency and productivity. Industry 4.0 is built on the foundation of automation and data exchange trends in manufacturing technologies. These trends include the use of cyber-physical systems (CPS), the internet of things (IoT), the industrial internet of things (IIoT), cloud computing, and cognitive computing.

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1.3. The upcoming wave of disintermediation, driven by Industry 4.0, will have ubiquitous impact on industrial product manufacturers and online vendors. According to the Industry 4.0 model, production will shift from being centralized to decentralized, and scale effects will no longer be the core factor of industrial production.

1.4. Currently, Industry 4.0 faces several challenges that must be addressed. These challenges include the following:

1. Scale versus customization: Personalized production somewhat runs counter to large-scale expansion. To be specific, the production of personalized products requires high flexibility and customization capabilities, making it difficult to scale up production and reduce costs through replicable business models. This conflicting nature is, to a certain extent, not conducive to capital entry and scaling of production.
2. Inconsistent technical standards: Industry 4.0 is a concept that encompasses multiple technologies and fields. As a result, technical standards, such as communication protocols and data formats, may vary across manufacturers and equipment, increasing the risk of technical incompatibility. This affects the efficiency and reliability of the entire production process and hinders the full application of Industry 4.0.
3. Barriers to data transfer: Due to issues such as commercial interests, data security, and data ownership, there are barriers to data transfer between enterprises. This hinders the digital advancement of Industry 4.0.
4. Large amount of investment and a long cycle: Industry 4.0 requires high capital investment and has a long cycle, with processes including updating production equipment, purchasing high-end software, and training technical personnel, which therefore entails high risk. Traditional financing models may not be able to meet the demand.

2. Industry 4.0 in the GBA

2.1. The GBA is still the main production base in China. Despite the large scale of exports in the GBA, the manufacturing industry in the region still faces challenges such as rising labor costs, environmental resource constraints, and a deteriorating trade environment. Exports from the GBA need to be upgraded to high value-added and high-quality products. Technology companies in the Tokyo Bay Area and the San Francisco Bay Area accounted for 60% of the revenue of the top 100 global technology companies in 2018. The GBA lags behind these two bay areas in terms of technology development.

2.2. Technological advancement has been the growth engine of the GBA. What makes the GBA so special is that it gathers most of the production factors together in one innovation, manufacturing, and logistics cluster. The GBA is home to some of the most innovative companies (e.g., Huawei and ZTE).

2.3. Industry 4.0 should be led by first-tier cities in the GBA. Considering that there are regional differences in China's economic development, and even a tendency for the strong to become stronger, the development gap between the first-tier cities in the GBA and other cities will continue to widen. Therefore, first-tier cities with strong financial strength, sound infrastructure, a rich talent pool, and advanced scientific research and development capabilities can provide more resources and have the ability to support enterprises in the transition to Industry 4.0.

2.4. Industry 4.0 integrates various innovative technologies in the field of digital technology, which requires substantial human and capital resources. Only large enterprises can provide these resources. Therefore, Industry 4.0 should start with large enterprises and gradually involve micro, small, and medium-sized enterprises (MSMEs).

2.5. Industry 4.0 will reshape the production and the organizational models of the manufacturing industry. Chinese manufacturing companies are active participants and promoters of Industry 4.0. The GBA has sufficient fundamentals to be a pioneer and lead China's Industry 4.0.

3. Government Policy Support for Industry 4.0 in Other Jurisdictions

3.1. To solve the financing problem of technology-based manufacturing enterprises, the government should play a key guiding role in building a public platform and establishing a sound intellectual property evaluation system, which serves as a firm basis for banks to extend services to such commercial entities.

3.2. The Malaysian government is providing a business grant of RM500,000 to SMEs that are ready to move towards Industry 4.0.[1] The Ministry of Trade and Industry also provides factory automation loans through other organizations, such as Henyep Malaysia Berhad.

3.3. In order to bolster support for traditional industries to improve their industrial structure, enhance product competitiveness, and achieve the purpose of industrial upgrading, Taiwan has formulated preferential loans for the revitalization of traditional industries; two-thirds of each loan is funded by the government, while one-third by the underwriting bank, and the loan risk is borne by the underwriting bank.

[1] Source: 馬來西亞國家工業 4.0 政策，https://www.mida.gov.my/

4. Impact of Industry 4.0 on the Financial Sector

4.1. With the advent of Industry 4.0, digitalization has become an inevitable trend in the financial industry, which has a huge impact on business activities. In 2021, 60% of traditional financial tasks will be automated—almost double the 34% in 2018.[2]

4.2. At present, Chinese enterprises are not fully and effectively using digital management tools. Take the automotive industry as an example. To produce high-quality, low-cost vehicles, Chinese enterprises need to build R&D capabilities, introduce digital tools and processes into the supply chain, establish a digital quality management system and realize the integration of information processes and systematic quality improvement throughout the value chain. Regardless of the industry, industrial upgrading and transformation require significant investment in R&D capacity building. Financial institutions can provide financing to support enterprises in meeting these needs.

4.3. Financial services are one of the areas that have considerably exploited Industry 4.0 opportunities. Driven by Industry 4.0, institutions in China's financial industry, including banks and insurance companies, are undergoing a profound transformation, characterized by the integration of advanced technologies such as artificial intelligence (AI), internet of things (IoT), big data, and cloud computing into financial products. We will examine the impact of Industry 4.0 on China's financial sector from two perspectives: banking and insurance.

4.4. Given the capital-intensive, long-term, and high-risk nature of Industry 4.0, financial institutions can adopt innovative financing methods to meet the financing needs of such enterprises. Banks, venture capital funds, and financial leasing companies can collaborate to provide enterprises with diversified and combined financing products, including loans, lease financing, equity financing, and other methods to effectively reduce the risk of a single financial institution. It is also possible to develop special insurance products for the financing activities of Industry 4.0 to further share the risks between enterprises and financial institutions. Additionally, financial

[2] Accenture, CFO Now: Breakthrough speed for breakout value, 2020.

institutions can leverage the massive data generated by Industry 4.0 to better evaluate companies and projects from both financial and operational perspectives, allowing them to offer more suitable financing products and reduce their own risks, while also providing risk management services to help enterprises reduce risks and losses.

4.5. Industry 4.0 also provides opportunities for financial innovation, such as supply chain financial products based on smart logistics and risk management products based on data analysis and artificial intelligence technology. By promoting the development of Industry 4.0, financial institutions can create more business opportunities and expand their market share.

4.6. Industry 4.0 and related advanced financial technologies may help reduce the operating costs and risks faced by financial institutions. However, most jobs in the financial sector are still sales-oriented, which require human-to-human interaction. Fintech demands self-service from customers, which can be costly for those with high time value. It is also challenging for machines to promote financial products to customers as a significant amount of investment relies on the trust and personal relationship between the customer and the financial agent. Furthermore, the amount of global investment depends on global wealth accumulated from past human economic activities, and technological progress cannot create a large amount of wealth in a short period of time. While advances in technology can make financial transactions easier, we should not expect them to replace all human-centric financial services in the future.

5. Reduction of Non-Compliance and Operational Risks

5.1. During the first three quarters of 2022, the People's Bank of China and the China Banking and Insurance Regulatory Commission (CBIRC) issued a total of 1,006 data fines to various financial institutions, including banks, insurance companies, trust companies, and non-bank payment companies. The total amount of fines was RMB860 million, and 486 institutions were affected (according to KPMG).[3] The reasons for punitive measures are sorted into five categories: data quality, data compliance, failure to report in accordance with regulations, failure to file in accordance with regulations, and failure to disclose information in accordance with regulations. In the case of Industry 4.0, bank data and regulatory data are interconnected, and the banking system automatically searches and organizes data, adapts to the requirements of regulatory authorities, updates the regulatory protocols in the bank's internal system and immediately issues warning prompts when the business is suspected of violations, thus avoiding the risk of financial institutions being notified and fined.

5.2. Banks can access real-time and dynamic transaction data of enterprises, such as those associated with capital flows and logistics. By analyzing and distilling this data, banks can comprehensively assess the riskiness of the first repayment source, which can help to mitigate credit risks at the source.

5.3. Under the intelligent logistics model, banks analyze the operating conditions of enterprises using various supply chain data and determine the financing for enterprises in the supply chain based on the credit model. At the same time, banks can dynamically adjust credit facilities based on changes in the supply chain data, providing customers with dynamic and customized financial services while avoiding credit risks.

5.4. In addition, Industry 4.0 also helps financial institutions control pledge risks. The advanced cargo pledge system of the internet of things enables real-time and dynamic supervision of a borrowing enterprise's raw material inventory, production process,

[3] KPMG, “監”聽則明：金融業監管數據處罰分析及洞察建議（2022 年三季度），https://assets.kpmg.com/content/dam/kpmg/cn/pdf/zh/2022/11/financial-industry-regulation-2022-q3-data-penalty-analysis-and-insight-suggestions.pdf

sales, and even user usage. This allows banks to lend on demand and according to progress, while also carrying out pre-loan investigations, prevent fraudulent default cases and improve risk control. Additionally, this system can help avoid issues such as repeated pledges and false pledges.

5.5. With the continuous upgrading of big data and artificial intelligence technology, insurance companies and third-party insurance technology platforms use multi-dimensional big data to unravel complex patterns, quickly identify a large number of potential business risks and effectively reduce their own business risks. Taking claims anti-fraud as an example, insurance companies and third-party insurance technology platforms are making use of modeling technology to accurately predict and identify various fraudulent behaviors and prevent and mitigate financial risks.

6. SME and Micro Finance

6.1. “Notice on Further Promoting the High-Quality Development of Financial Services for Small and Micro Enterprises in 2021” encourages banking and financial institutions to make full use of financial technologies such as big data, blockchain, and artificial intelligence in agriculture, manufacturing, wholesale and retail, logistics, and other key areas to build a financial platform catering to the entire supply chain or industry chain.

6.2. Small and medium-sized enterprises have potential problems such as a lack of long-term financial data and inadequate information disclosure, making it difficult for banks to accurately assess the risk-return profile of their loans. Big data and its application brought about by the Industry 4.0 production model, as well as the new risk assessment system, can greatly alleviate the problem of information asymmetry and optimize risk pricing. Many enterprises that cannot obtain loans under traditional risk control models can also receive financial support from banks.

6.3. In the era of Industry 4.0, IoT big data can help banks analyze the credit worthiness of small enterprises in real time so as to accurately calculate the credit limit. At the same time, banks implement dynamic monitoring of enterprise operational data through internet of things technology, which improves the bank's credit risk management capabilities. It is conducive to resolving the difficulty in loan access caused by issues of collateral acceptance that confronts small enterprises.

6.4. In the past, commercial banks could not undertake microfinance businesses because of the high labor costs relative to the loan amount. Commercial banks can now adopt AI technology to provide microfinance at a low cost. For example, the adoption of technology-driven microfinance in rural China to provide farmers with access to finance has ushered in a new era of financial empowerment for vulnerable groups.

7. Scenarios of Financial Services under Industry 4.0

7.1. There are many applications of financial services within Industry 4.0. For example, an intelligent car can determine whether it needs to refuel or replace parts. Using a price comparison program on a mobile phone, the car can determine which service, payment method, and delivery option is better.

7.2. If the components of a smart washing machine fail, the washing machine can arrange for repair by itself; likewise, a smart refrigerator can automatically order milk when the stock stored is exhausted. Smart toothbrushes can monitor oral health conditions, and the data collected can be used as a basis for oral treatment. They can also directly make dental appointments in the future. Financial institutions that connect to these smart devices can find business opportunities immediately.

7.3. Banks can formulate all-encompassing financial solutions for consumers throughout the life cycle of vehicles, including car selection, car purchase, after-sales service, and second-hand car replacement.

7.4. Table 1 lists the use of AI and internet of things by some banks.

Table 1: The use of AI and internet of things by some banks

Postal Savings Bank of China and Ant Financial Services	Postal Savings Bank embeds financial services in Ant Check Later and Ant Cash Now through the Alipay app. Ant Financial uses consumption scenarios to carry out risk identification and quickly provides flexible credit limits to users of Ant Check Later and Ant Cash Now. Postal Savings Bank independently approves credit applications from customers of Ant Financial Services based on its own risk control model and provides actual available credit limits. Through the business cooperation mode of brand superposition and service binding, the two parties formed a benefit sharing mechanism for Ant Financial to win customers and the Postal Savings Bank to lend funds.
WeLab	Using big data and social engineering to analyze whether borrowers are reliable, the company offers "I come to loan", whose 30-day overdue repayment rate is only 1-2%, a rate similar to that of ordinary banks; this substantiates the notion that this concept is not a high-risk one.
ICBC	In 2022, ICBC innovated "E-chain fast loan", integrating and analyzing capital flows, logistics, and information flows data of the industrial chain based on the online interactive trade information of core enterprises to effectively solve the financing problems of a large number of farmers and sole proprietors in industries such as agriculture, logistics, and transportation.
ABC	In May 2022, the "Bank-enterprise Cloud Link" platform of ABC successfully connected to the supply chain platform of Linklogis, enabling the application of digital RMB in the entire supply chain for the first time in the industry.
Ping An Bank	It uses "AI+T+Offline" (AI + remote banking + offline banking) to create online and offline operation, thus allowing closed-loop operation of banking services that satisfy the needs across different facets of daily life (food, clothing, accommodation, transportation, and entertainment) and building a flow pool for retail business development.
Ping An Bank	Ping An Pocket Bank 4.0 has introduced products and services from subsidiaries spanning life insurance, property insurance, pension insurance, securities, futures, asset management, and trust. Through two major channels of financial information and financial live streaming, it provides customers with comprehensive knowledge and financial planning suggestions.
Ping An Bank	It launches an intelligent investment advisor in Pocket Bank, which can provide customers with personalized recommendations on investment portfolios based on their transaction records and risk preferences. In addition, through big data analysis of customer behavior, it is possible to predict the service or product that each customer is most likely to use, which can then be presented to the corresponding customers through an app.
Ping An Bank	In June 2022, the steel warehouse receipt pledge loan, an internet of things financial product, was officially released. The use of internet of things technology enables intelligent management, wherein the status of warehousing goods is rigorously monitored, thus allowing regulators, customers, banks, and other parties to fully supervise the conditions and changes of movable assets.

8. Industry 4.0 and Banking

8.1. In the era of Industry 4.0, the transformation and upgrading of traditional manufacturing enterprises to “smart factories” is poised to stimulate a multitude of financial needs, and banks can help them build intelligent IT systems, predict needs and tailor financial service solutions according to the characteristics of different enterprises.

8.2. The use of big data in Industry 4.0 to innovate financial business models has caused considerable disruption to the traditional banking industry. The traditional banking industry should also accelerate the pace of reform and innovation, adapt to this trend and gradually transform from a standardized and unified service model to a customized one. Banks need to change the “one-size-fits-all” interest rate pricing and product development model, be adept at exploiting the massive big data resources brought by the internet of things and discover business opportunities from a large amount of data.

8.3. Under Industry 4.0, banks can glean more comprehensive insights from corporate credit, capital flows, and other data and provide customers with dynamic and customized financial services. For example, banks can analyze the operating conditions of enterprises by using various data along the supply chain, determine the appropriate levels of financing for enterprises via the credit model and set different borrowing ceilings. Given such a transformation, when applying for a loan online, enterprises do not need to submit a large stack of documentation. The systems of banks will automatically assess the loan’s interest rate and grant the loan.

8.4. The business opportunity against the backdrop of Industry 4.0 is that banks can gain a more accurate and timely understanding of enterprises. Banks can use user data to gain insights into the actual operational conditions of each enterprise, which can help reduce the probability of non-performing loans. Furthermore, if the monitoring system detects irregularities in the cash flows of an enterprise, it can automatically prompt the bank to take timely marketing measures, such as recommending deposit or other wealth management products to the customer when the cash inflow of the enterprise is large. In the case of discerning tight cash flows, it can also advance financing options to the customer in time. This helps companies stabilize cash flow fluctuations.

8.5. Each customer is a member of the network and has trade relationships and connections with other counterparts (both vertical upstream and downstream value chain relationships and horizontal relationships with similar customers), so engaging one customer in the network is equivalent to engaging all customers in a network in batches.

8.6. To meet the demand for data interaction among banks and different industrial ecosystems, a cross-industry data connection channel should be established. This could involve accessing data ports from logistics, customs, as well as industrial and commercial registration departments, or connecting logistics company platforms, industrial internet platforms, and cross-border e-commerce platforms. For enterprises that are building digital platforms, financial institutions should help them establish unified technical and data standards to achieve connectivity with financial institutions and other enterprises.

8.7. Banks can also use Industry 4.0 to establish a more comprehensive supply chain monitoring system, help companies establish closer supply chain cooperation through supply chain finance and jointly promote the digitalization and smart upgrade of the supply chain, alleviating the surge in costs associated with customized production.

8.8. Banks can contribute to easing the pain points in the development of Industry 4.0 in many ways. For example, they can provide various types of financing support for Industry 4.0 enterprises, promote financial technology applications to help enterprises better manage assets and promote digital financial services to facilitate the integration of the real economy with the digital economy. The financial services that banks can offer can be summarized as follows:

1. providing more preferential and flexible financial services for small and medium-sized enterprises to balance the conflict between personalized production and large-scale expansion,
2. encouraging the harmonization of technical standards by providing technical loans and participating in technology alliances,
3. breaking down transaction barriers by establishing data exchanges and providing services such as data asset insurance.

9. Industry 4.0 and Insurance

9.1. Currently, the insurance penetration rate in Mainland China is about 4.42%, which is lower than the international standard of 6.13% and Hong Kong's rate of 17.94%. This low penetration rate indicates that the domestic insurance market is untapped. As of 2017, there were a total of 193 insurance companies operating in Mainland China, of which 56 were foreign insurance companies, accounting for 29% of the total number of insurance companies. However, foreign insurance companies hold only 5.85% of the overall market share and 7.43% in the foreign life insurance market.[4] The market is dominated by five major domestic insurance companies: China Life Insurance Company, Ping An Insurance of China, Xinhua Insurance, People's Insurance Company of China, and China Pacific Insurance Company. These five domestic insurers together hold a market share of around 55.8%.

9.2. Industry 4.0 presents an opportunity for insurance companies to expand their coverage beyond traditional areas and into new technologies, materials, energy conservation, environmental protection, and other innovative fields. They can promote innovation in insurance services and technology-based insurance products to effectively mitigate the financial risks of innovative enterprises.

9.3. The application of AI in the insurance industry mainly focusses on the following areas:

1. Intelligent customer service: Artificial customer service, enabled by machine intelligence, has matured markedly. In the future, machines are poised to gradually replace human workers in the provision of customer service.
2. Intelligent underwriting: Big data technology is applied throughout the underwriting process in the insurance industry, enabling faster underwriting. Insurers can significantly reduce risk and improve efficiency through intelligent underwriting.
3. Intelligent claims management: Artificial intelligence technology enhances insurance companies' claims services and risk control capabilities.

[4] Source: China Banking and Insurance Regulatory Commission

4. Intelligent risk control: Artificial intelligence technology can be used to identify, block and report risky transactions to the authorities in real time.

Table 2 lists the use of AI in some insurance companies.

Table 2: The use of AI in some insurance companies

Ping An Insurance	The company has established a comprehensive reform strategy encompassing "channel + product + digitalization", which spans across product development, sales, service, and operations. Through the deployment of a new generation of underwriting insurance systems, the underwriting and insurance process can be expedited, with the quickest cases completed within 10 minutes. They have implemented mechanisms like "Quick compensation", which ensures payment within 30 minutes of the application, and "Smart pre-compensation", which allows claims to be paid in advance during hospitalization.
China Life	This company has developed the "Claims Intelligent Anti-Fraud Platform" for auto insurance. It combines historical claim experience data from the company with real-time data to effectively provide real-time warnings of potential fraud.
CPIC Life	The company's "Nuclear Power" system leverages AI to build underwriting models. These models are created by analyzing historical big data and using intelligent algorithmic models such as machine learning, enabling continuous optimization and upgrades.
CPIC Life	CPIC Life's "Beidou" system monitors the business data of various departments in companies and their personnel. It identifies and evaluates potential risks, such as fraud and illegal fundraising, thereby enhancing the technical level of compliance risk identification in key areas of insurance companies.

9.4. One key area where insurance companies are utilizing Industry 4.0 technologies is auto insurance. With the rise of connected cars and the Internet of Vehicles (IoV), insurance companies are developing products that rely on big data analysis for risk pricing and product customization, which are known as Usage-based Insurance (UBI). Telematics technology helps collect data on driving behavior, mileage, and car usage time, enabling personalized premiums based on the risk profile of each driver.

9.5. In 2016, the China Insurance Regulatory Commission (CIRC) issued guidelines to promote the development of UBI, encouraging insurance companies to offer UBI products and services. The government also provided tax incentives for insurance companies offering UBI policies. These programs offer discounts to drivers who exhibit

safe driving habits, incentivizing safe driving and helping insurance companies reduce costs through better risk management.

9.6. Another key area where insurance companies are utilizing Industry 4.0 technologies is health insurance. Insurance companies are developing health insurance products that leverage big data and AI to offer personalized and cost-effective solutions to customers. Collaborations with medical big data companies help formulate risk control models based on internal information of insurance companies and data from external entities like hospitals and pharmaceutical companies.

9.7. By 2050, the population of China aged 65 and over is projected to reach approximately 480 million, making up as much as 35% of the total population. According to the "2019 China Pension Actuarial Report 2019-2050" from the Chinese Academy of Social Sciences, China's institutional maintenance rate will double in the next 30 years, significantly increasing the financial strain on basic pension insurance. The insurance industry is anticipated to progress further with the advent of Industry 4.0, which can facilitate the development of insurance products for the elderly and make their post-retirement life more convenient. With Industry 4.0, insurance companies can collaborate with hospitals in the GBA to provide customers with one-stop medical services. Additionally, policy registration, record filing, claim settlement, and premium payment can all be managed through online electronic channels.

9.8. To align with the development of the GBA, the HKSAR government has initiated the Insurtech Sandbox and a fast-track Hong Kong insurance license approval scheme for online insurance companies in recent years, promoting the advancement of insurance technology.

10. Future Landscape of the GBA

10.1. The financial industry is the core of the modern economy. Its advanced level and scale of development play a substantial role in economic development. A prosperous financial sector is crucial to the realization of Industry 4.0 in the GBA. Industry 4.0 requires more sophisticated financial services. As residents of less developed cities in the GBA gain access to more abundant and sophisticated modern financial services, what social and economic benefits will they enjoy? Shenzhen and Zhaoqing ranked first and last among the nine cities in the GBA in terms of financial service development. We will use the two cities as a comparison to analyze how the differences in the development of the financial industry in the GBA affect social and economic life.

10.2. Table 3 shows that from 2017 to 2021, the GDP of the financial industry in Shenzhen and Zhaoqing was increasing, but the gap between them has also widened. Table 4 and Figure 1 show a positive relationship between financial development and per capita disposable income. As the gap in financial industry development between the two regions gradually widens, so too does the disparity in their per capita disposable income. Consequently, in regions with relatively developed financial industries, residents' per capita disposable income will be higher than in regions with less developed financial industries.

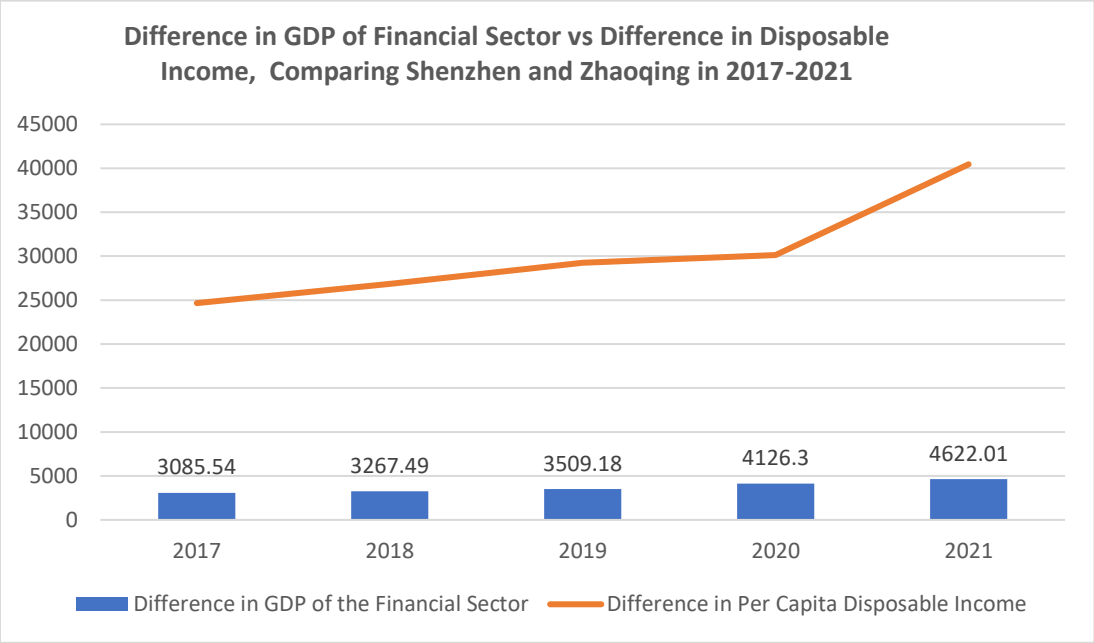
Table 3: GDP of the financial industry in Shenzhen and Zhaoqing, 2017-2021 (100 million Yuan)

	2017	2018	2019	2020	2021
Shenzhen	3160.24	3351.89	3609.74	4236.26	4738.80
Zhaoqing	74.70	84.40	100.56	109.96	116.79
Difference	3085.54	3267.49	3509.18	4126.3	4622.01

Table 4: Per capita disposable income of Shenzhen and Zhaoqing, 2017-2021 (Yuan)

	2017	2018	2019	2020	2021
Shenzhen	52938	57544	62522	64878	70847
Zhaoqing	28276.1	30679.6	33259.8	34752.0	30394.1
Difference	24661.9	26864.4	29262.2	30126	40452.9

Figure 1



10.3. The enhancement of financial services will subtly influence education. The first impact is on traditional campus education. With the comprehensive development of finance playing an increasingly significant role in the daily life of residents in the GBA, high schools may offer elective courses in economics and finance. Offering these courses can provide students with an opportunity to gain an understanding of finance in advance, which can facilitate a smoother transition to university courses in this field.

10.4. Regions with better financial industry development also tend to have higher education levels. Table 5 shows that the more developed the financial industry, the higher the undergraduate acceptance rate.

Table 5: Undergraduate acceptance rate in Shenzhen and Zhaoqing from 2017 to 2021 (%)

	2017	2018	2019	2020	2021
Shenzhen	70.12	73	72.37	72	71.49
Zhaoqing	24.51	27.79	35.67	36.24	29.70

10.5. The development of the financial sector reduces poverty and inequality by broadening access to finance for the underprivileged. It also reduces their vulnerability to shocks, lets them use leverage to make profits from stock and other financial markets and improves their social mobility.

10.6. Another socioeconomic benefit comes from individual investor education. As the financial industry develops, financial products or services will undoubtedly become commonplace in the GBA, allowing individuals to have increased exposure to finance-related knowledge. In China, investor education is initiated by financial regulatory agencies and self-regulatory organizations, with implementation carried out by various financial institutions. Notably, 84.63% of individual investor education in China comes from financial institutions, according to the “China Investor Education Status Survey 2021”.

10.7. The improvement of financial services in underdeveloped cities in the GBA will enable more people to access financial services and provide residents with more comprehensive investor education and basic financial knowledge, thereby reducing the number of financial fraud victims and bringing about a more rational market and a higher quality of life.

10.8. As financial services become increasingly ubiquitous, there will be a surge in demand for jobs in this sector. More people will work in areas related to financial services. These jobs are not only in traditional finance but also in emerging fields such as fintech, artificial intelligence, and other service sectors such as financial education. Talent migration between regions may become commonplace in the GBA, and the facilitation of people's movement is a top priority in promoting market connectivity.

10.9. With the overall enhancement of financial services, the financial industry is likely to create more jobs. It may also offer college students more practical financial experience and internship opportunities, enriching their campus life and all-round development.

10.10. The more developed the financial industry, the higher the proportion of workers in the service sector. From Table 6, it can be seen that from 2017 to 2021, the proportion of service sector employees in Shenzhen remained stable at around 61%. With the development of the financial industry, Zhaoqing has seen an increase in the proportion of workers in the service sector in the past three years.

Table 6: The percentage of service sector employment in Shenzhen and Zhaoqing from 2017 to 2021

	2017	2018	2019	2020	2021
Shenzhen[5]	62.01%	62.60%	61.30%	61.26%	60.85%
Zhaoqing[6]	32.47%	35.16%	38.49%	51.88%	52.20%

10.11. The upgrading of the regional industrial structure could provide more white-collar service sector jobs for city residents. Demand for high-end clothing and dining would increase, indicating an upgrade of the consumption structure. In addition, with consumer loans and the use of credit cards becoming more common, consumption of luxury and durable goods, such as jewellery and automobile, will rise.

10.12. As the foundation of the financial industry improves, cities with financial industry clusters are expected to gradually emerge in the GBA. Through the effective allocation of financial capital, these cities could promote investment and economic growth and help increase residents' income levels. As a result, residents' consumption scale is expected to further expand, potentially leading to a further upgrade of the consumption structure.

10.13. The more developed the financial sector, the higher the per capita savings of residents. As can be seen in Table 7, from 2017 to 2021, the per capita deposits in Shenzhen were higher than those in Zhaoqing, and the gap between the two places gradually widened.

Table 7: Per capita deposits in Shenzhen and Zhaoqing from 2017 to 2021 (10,000 Yuan)

	2017	2018	2019	2020	2021
Zhaoqing	3.44	3.77	4.02	4.34	4.83
Shenzhen	7.03	8.29	9.55	10.79	11.78
Difference	3.59	4.52	5.53	6.45	6.95

10.14. For GBA residents, there were few investment options in the past, and most residents still chose deposits or traditional financial products. According to People's Bank of China statistics, in the fourth quarter of 2022, 61.8% of Chinese residents

[5]Source: 深圳統計年鑒 2022-Page 52.
https://tjj.sz.gov.cn/attachment/1/1382/1382770/10390917.pdf
[6]Source: 肇慶統計年鑒 2022.
http://www.zhaoqing.gov.cn/zqtjj/gkmlpt/content/2/2794/post_2794991.html#4470

preferred to deposit most of their funds in bank accounts, and only 15.5% preferred to make financial investments.

10.15. With the development of financial services in the GBA, financial institutions such as funds and securities companies are set to play a more significant role in people's lives. Through the different types of financial products and services these institutions provide, residents of the GBA will certainly have more financial investment choices and can gain a more comprehensive and rational understanding of the financial entities they interact with.

10.16. There are still many investment restrictions and barriers between mainland China, Hong Kong, and Macao, and the cross-border investment efficiency between these regions is relatively low. There is still vast room for development in the financial markets. Therefore, developing the GBA's financial markets and creating more financial investment products and channels will not only aid the area's economic development but also provide more choices for investors.

10.17. From the perspective of financial services, the provision of comprehensive and diverse financial services in the GBA plays a crucial role in promoting economic development and improving the quality of life for residents in the region. With the continuous development and maturing of financial technology, financial services have evolved from traditional institutions to encompassing the realm of the Internet and mobile platforms. As a significant financial services hub in China and around the world, the GBA has attracted numerous fintech companies. These companies leverage innovative financial technology to better serve enterprises and residents in the region, offering them more convenient financial services.

10.18. Providing better financial services to the GBA plays an important role in promoting the economic development of the GBA and improving the quality of life of its residents. It is undeniably a more positive solution as compared with the economic stagnation or slowdown represented by the notion of "business as usual".