

Chapter 2

Report on the Industrial Transformation Development of China's Special Economic Zones

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In 2013, China's special economic zones continued their steady quality-oriented growth, sought development amid innovations and pursued upgrading amidst transformation, in which industrial transformation and upgrading accelerated, reforms and innovations were intensified, various acute contradictions in economic development were addressed, and various difficulties including the shortage of industrial orders, rising costs for raw materials and increasing labor costs, were overcome. GDP growth rates in five major special economic zones were still higher than the national rate (7.7 %). Double-digit growth rates were achieved in Shenzhen, Zhuhai and Shantou. Shenzhen's GDP growth rate (10.5 %) was slightly higher than that in the previous year, while the GDP growth rates in Zhuhai, Shantou and Hainan increased somewhat and stood at 10.5, 10 and 9.9 % respectively, and Xiamen's GDP growth rate decreased with respect to that of the previous year, 12.1–9.4 %.

The industrial economy steadily developed. The industrial added value in Shenzhen, Zhuhai and Shantou grew by 9.6, 10.6 and 12.6 % respectively, while the industrial added value growth rates in Xiamen and Hainan slightly declined compared with the previous year, being 11.9 and 6.4 % respectively. The industrial added value growth rates in Zhuhai, Shantou and Xiamen were higher than the national level (7.6 %), while that in Hainan was lower than the national level. The industrial added value above the designated scale in Shenzhen grew by 9.6 %, slightly lower than the national one (9.7 %). From the perspective of economic types, state-owned enterprises, joint-stock enterprises, foreign, Hong Kong, Macau and Taiwan-funded enterprises in the special economic zones delivered added value at growth rates higher than those for the previous year, to varying degrees. The added value growth rates at state-owned enterprises in Zhuhai and Shantou

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increased to 10.5 and 14.6 % respectively, but that of the state-owned enterprises in Hainan fell to 5.6 %. Joint-stock enterprises in the special economic zones continued maintaining a double-digit growth. Joint-stock enterprises in Shantou enjoyed the highest growth rate, reaching 23.3 %, up 7 % compared with the previous year. As the pacesetters for China's reform and opening-up, they have a new situation in industrial development.

Basic Trends of Industrial Upgrading and Development in the Special Economic Zones

High-End Development of the Manufacturing Industry Promoted Industrial Transformation and Upgrading

As land resources in Shenzhen increasingly fall short, the spaces available for development of traditional industries are limited, costs for manpower, raw materials, electricity, etc. are on the rise and industrial profit margins are declining with each passing day in Shenzhen, traditional industries are beleaguered by not a few problems in the course of development. In 2013, 3145 low-end backward enterprises were phased out, cleared and transformed in Shenzhen, and traditional industries continuously extended to the high end of the value chain, furthermore, the consigned designs and own brands in processing trade enterprises made up more than 65 %. Such industries as clock and watch, gold and jewelry, garment, furniture, eyewear, etc. are undergoing an accelerated fashion-oriented, brand-focused transformation, among which the gold and jewelry industrial cluster base has become a national well-known brand building demonstration zone, and the clock and watch industry is showing expedited agglomeration development, turning Shenzhen into the only "Clock and Watch Capital of China" nationwide. The phaseout of low-end manufacturing and high-end development of the manufacturing industry represents the new route for industrial transformation and upgrading in Shenzhen. In 2013, the added value of the advanced manufacturing industry reached 416,287 million yuan in Shenzhen, up 12.2 %, accounting for the astonishing 73.1 % of the added value of industries above a designated scale, while the added value of the hi-tech manufacturing industry stood at 337,067 million yuan, up 12.3 %, accounting for as high as 59.2 % of the added value of industries above a designated scale.¹ In order to scientifically identify the directions and priorities for the transformation and upgrading of traditional industries, in 2013, Shenzhen vowed, in the released *Several Opinions Concerning the Acceleration of Information-based Development*, to push the transformation and upgrading of traditional industries forward by speeding up the fusion of informatization and

¹Shenzhen Statistics, Shenzhen Economic Operation in 2013. <http://www.szjt.gov.cn/xxgk/tjsj/tjfx>, February 18, 2014.

industrialization, and developed policies and measures for further boosting the development of e-commerce. Currently, the “Shenzhen Mall (www.szmall.com)” e-commerce platform has clustered more than 3000 enterprises, and Shenzhen’s e-commerce trade volume has hit 950 billion yuan.²

2013 was a year for making breakthroughs in Zhuhai’s industrial transformation and upgrading, during which the profound fusion between informatization and industrialization was strengthened, and work was done in Zhuhai to vigorously promote the steady upgrading of the traditional advantageous industries, including household electrical appliances represented by Gree Electric Appliances Inc., printing consumables and fine chemical, and industrial development surged out of a trough. Gree Electric Appliances Inc. became the first 100-billion level specialized household appliances enterprise in China and the first 100-billion level enterprise in Zhuhai; with a total investment of 1.5 billion yuan, after completion and operation, the Canon factory in Zhuhai Hi-tech Zone can expand its camera production capacity and speed up its product and industrial upgrading. With overall technology at an advanced level both domestically and internationally, the Founder ACCESS Package Substrate Project in Fushan Industrial Park will lead the industrial structure towards the high end. With the construction of Lenovo Seine Printer R & D Manufacturing Base and an international consumables purchasing center, Zhuhai’s printing consumables industry will also gradually transform from simple OEM support to self-dependent innovation.³ In 2013, the added value of Zhuhai’s advanced manufacturing industry increased by 12.2 %, in which the added value of the equipment manufacturing sector, the steelmaking and processing sector and the petroleum and chemical industry grew by 13.3, 15.2 and 7.2 % respectively.

With respect to traditional industries in Shantou, eight major pillar industries, including textile and garment, crafts and toys, chemical plastics, machinery and equipment, food and pharmaceuticals, printing and packaging, electronic information and audiovisual products, have basically taken shape, and 17 industrial clusters with their own characteristics have been developed, among which the textile and garment industry has the largest aggregate. In order to elevate the scale and level of traditional industries, efforts have been made in Shantou to energetically develop four major principal industries, including modern logistics, e-commerce, convention and exhibition, specialized market, and combine off-line exhibition with online e-commerce platforms for promotion to accelerate the transformation and upgrading of the traditional industries. A number of e-commerce platforms supported by distinctive industrial clusters have been built and are highly influential within industries and regions. For example, Big Tree Toys “Avatar Mall Online” is a specialized toy product e-commerce platform with the most complete categories at home and abroad; China Engineering Machinery

²Statistical Bulletin on the National Economic and Social Development of Shenzhen in 2012. http://www.szjt.gov.cn/xxgk/tjsj/tjgb/201304/t20130412_2127275.htm, April 10, 2013.

³Shen Wenjin, et al., With “Three-High-One-Characteristic” for Zhuhai’s Transformation and Upgrading, Blue Roadmap Leads Zhuhai’s Economic Leap, *Zhuhai Daily*, February 26, 2013.

Information Online (www.6300.net) has become the most influential national e-commerce platform with the longest history in the heavy industry sector in China. Shantou gives full play to its advantages as the hometown of overseas Chinese and a special economic zone to promote investment attractions for advanced manufacturing, support local enterprises in becoming large and strong and achieve transformation and upgrading. In 2013, the added value of Shantou's advanced manufacturing industry was 8474 million yuan, up 9.8 %. The added value of the high technology manufacturing industry was 2907 million yuan, up 4.5 %. Information technology has been universally popularized in Shantou's manufacturing field, with the popularization rate in the mechanical manufacturing industry reaching 70 %; the rate of popularization of computer-aided design and manufacturing technology in the design industry was as high as 90 %, while leading enterprises have introduced industrial robot and flexible operating systems to replace manual operations. More than 80 % of the enterprises above the designated scale in Shantou have undergone enterprise information-based construction, among which nearly 90 % of them have completed the transition from the single-computer working mode to the multi-computer collaborative network operation mode, and more than 75 % of them have set up an information technology support department.⁴

In Xiamen, the effects of series of policies for boosting transformation and upgrading of industries to enlarge and strengthen the mainstay industries have gradually emerged. 13 main industrial chains delivered an output value from industries above the designated scale, worth 319,998 million yuan throughout the year, contributing 84.1 % to the output value increment, among which six industrial chains hit 10 billion yuan. Industries played an evident role in driving economic growth, contributing 55.9 % to Xiamen's economy. In order to guide and support enterprises in developing towards the high end of the industrial chain, Xiamen increased its support for industrial technical transformation and supported enterprises in completing technical transformation investments worth 20,180 million yuan; the industrial technical transformation investments grew by 15 %, an increase of 8 percentage points in the proportion of industrial investments. A host of major technical transformation and improvement projects, including the Golden Egret Precision Hard Alloy Cutting Tool, Hongfa Electroacoustic and Anjoy Food, have been successively completed and put into operation. Actions were taken to vigorously develop cloud computing, Beidou Satellite application, big data, e-commerce and other industries, and quicken the fusion between informatization and industrialization. Leading projects for information industrial clusters and small and medium-sized innovative enterprises involved in consumer electronics and industrial design were actively introduced. The Internet of Things technologies were energetically applied. Key technological chains were improved and the fusion

⁴Shantou Municipal Economic & Information Bureau, Shantou's Industrial, Commercial and Trade Information and Economic Development in 2013 and Future Development Thinking. <http://www.stjxj.gov.cn/NewsDetail.aspx?id=414>, March 3, 2014.

between informatization and industrialization led the development of industrial clusters to impel industrial transformation and upgrading. In 2013, the high-end development of Xiamen's advanced manufacturing industry was geared up, with a total output value from industries above the designated scale, standing at 467.8 billion yuan, up 13.1 %. Among the 1664 industrial enterprises above the designated scale, 63 enterprises delivered an output value of more than one billion yuan, 8 enterprises realized an output value higher than ten billion yuan. The biopharmaceutical output value exceeded 20 billion yuan, up 30 %. Two major pillar industries, electronics and machinery, brought about 183.7 billion yuan and 119.6 billion yuan respectively, and Xiamen became the largest touch screen component research and development production base in the world.⁵

In 2013, Hainan's industrial production faced many difficulties, and with the impact from the downturn of refining and chemical maintenance, the petrochemical and automobile industry and other factors, Hainan's industrial production grew at a low speed. In order to maintain a steady industrial growth, more support was provided in Hainan for the development of industrial enterprises in terms of policy, capital, energy dispatching, etc. On the one hand, in Hainan Province, a one-billion-yuan special fiscal fund was arranged to support the development of major industrial parks, to guide and encourage financial institutions to extend more credit to small and medium-sized enterprises, and to further mitigate the tax burden on enterprises. Eight major pillar industries delivered an industrial added value worth 43.4 billion yuan, up 7.2 %, representing an increase of 0.9 % points compared with industries above the designated scale, accounting for 85.3 % of the industries above the designated scale, being 0.7 % points higher than that for the previous year. On the other hand, the adjustment of the industrial structure was intensified, and the launch of projects with high energy consumption was strictly controlled, backward production capacity was resolutely phased out, etc., and 17 rubber processing factories, 2 sugar refineries, 2 brickyards, 1 aquatic product processing factory, 2 papermaking factories and 1 coal-fired generating unit were closed. Comprehensive energy consumption significantly decreased, and energy consumption per 10,000-yuan GDP dropped by about 3.5 % compared with the previous year. The high-end development of the manufacturing industry was further increased. In 2013, the hi-tech industrial manufacturing industries above the designated scale in Hainan delivered an industrial added value amounting to 6051 million yuan, an increase of 10.9 % points compared with the growth rate of the industrial added value from industries above the designated scale, contributing 28.6 % to the growth of the industrial added value from industries above the designated scale. The output value from three major industries including pharmaceutical, electronic information, new material and new energy industries among those industries above the designated scale accounted for 9.9 %, up 1.4 % points. The added value from the electronics and communications equipment manufacturing

⁵2014 Work Report of the Xiamen Municipal Government, January 21, 2014.

industry increased by 28.4 %, while that from the pharmaceutical industry and the medical device and instrument manufacturing industry grew by 8.4 and 33.9 % respectively.⁶

Strategic Emerging Industries Stimulated Economic Growth

The role of Shenzhen's strategic emerging industries in driving economic growth became prominent. In 2013, the total scale of Shenzhen's strategic emerging industries reached 1.63 trillion yuan, up 19.8 %, with contributions to the growth of the GDP hitting 50 % for the first time, thus strategic emerging industries became the main engine for economic development. The added value from strategic emerging industries stood at 500,250 million yuan, up 20.5 %, 10 % points higher than Shenzhen's average economic growth rate, accounting for 34.5 % of Shenzhen's GDP, up 4.6 % points compared with the previous year. Among six major strategic emerging industries, the cultural creative industry, the new generation information technology industry, the internet industry, the new energy industry, the new material industry and the biological industry delivered an added value worth 135,700 million yuan, 218,030 million yuan, 59,059 million yuan, 33,597 million yuan, 31,036 million yuan and 22,828 million yuan respectively. The *Overall Development Plan for International Biological Valley* was released to incorporate high-end biopharmaceutical engineering, next-generation information network and biological gene industry into the pilot development of the national strategic emerging industry cluster.

Zhuhai is still in the period for growing strategic emerging industries. In 2013, 53 major projects for strategic emerging industries continued being carried forward, and efforts were made to advance the construction of four provincial-level strategic emerging industry bases including aviation, software and integrated circuit design, ocean engineering equipment manufacturing and new energy bus; 1657 million yuan were invested in the development and construction of nine projects for strategic emerging industries. These projects include four production projects, that are the Lenovo Seine Printer R & D Manufacturing Base, the Founder ACCESS Packaging Machine Project, the Canon factory in the Zhuhai Hi-tech Zone, the Zhuhai Livzon Group New Industrial Park, and two continued projects, including Yintong New Energy Automobile and the Hi-tech Zone Advanced Business Park, and three new projects, that are the Zhuhai United Laboratories' new project, the HP Smart City (Zhuhai) Project and the CNOOC Zhuhai Fine Chemical Park Project. Led and spurred on by these major construction projects, Zhuhai's strategic emerging industries will enjoy a gradually prominent, more distinctive and advantageous position.

⁶Hainan Statistics, Analysis of the Economic Operation of Industries above the Designated Scale in Hainan in 2013. www.hainan.gov.cn, January 27, 2014.

Shantou has witnessed a certain development of strategic emerging industries and has been home to such strategic emerging industries as new materials, high-end electronic information, biological medicine, semiconductor lighting, animation, solar photovoltaic, environmental protection and software, and a group of backbone enterprises including Orient Zirconic Industry, GOWORLD, ALPHA Animation, Golden Glass and Ecota Environmental Technology. In particular, it has a good foundation and developmental potential for developing such industries as zirconium, Beidou Navigation Satellite System, satellite remote sensing, big data and new environmentally-friendly materials. In order to ensure the implementation of preferential policies for strategic emerging industries, the *Several Measures of Shantou City for Supporting Investment in and Development of Backbone Industrial Enterprises and Strategic Emerging Industries* was issued in June, 2013 to develop a series of support measures for enterprises, which were engaged in strategic emerging industries and were given the priority for development, in terms of land use, finance and taxation, energy, financing, scientific research, foreign trade, etc. For example, fiscal support measures stressed the key points and optimized the directions for promoting the development of strategic emerging industries and the construction of park agglomerations. Enterprise investments in strategic emerging industries were provided with a guarantee of land according to the *Measures of Shantou Special Economic Zone Concerning Transfer of Land Use Right for Modern Industries*.

Xiamen has focused on cultivating and developing such strategic emerging industries as biological medicine and high-end medical services, new generation information technology, new materials, new energy, software and photoelectricity. Take the biopharmaceutical industry as an example: the industrial output value from the biopharmaceutical industry was 8.5 billion yuan in Xiamen in 2013, accounting for more than 50 % of the output value from the biopharmaceutical industry in Fujian Province. With the development and construction of Haicang Biopharmaceutical Industrial Park, comprehensive support will be provided for the overall upgrading of the regional innovative pharmaceutical industry. Projects including Top Health, Lanwan Biological Project, Double Medical, AmoyDx, Phase II general-purpose biopharmaceutical workshop building, etc. have been launched in this Industrial Park, where the preliminary work on Highlight LED, MainHouse Electronic, Tongda Photoelectric, etc. has been finished and these projects are expected to be fully completed and in operation in this Park by 2015. Xiamen Torch Hi-tech Zone is another important carrier for cultivating and developing strategic emerging industries. In 2013, Xiamen Torch Hi-tech Zone obtained 41 projects supported by the National Innovation Fund, where 194 cumulative projects supported by the National Innovation Fund have been obtained and approved cumulative funds have exceeded 100 million yuan.

Hainan has presented a good development momentum in strategic emerging industries, with the output value from strategic emerging industries hitting 60 billion yuan, while the proportion of industries above the designated scale increased by 1.7 % points. In Hainan, the output value from seven major strategic

emerging industries represented by new energy automobile, electronic information, biological medicine, etc. rose by 17.9 %. The information industry took the first place with its main operating revenue reaching 32 billion yuan; the pharmaceutical industry delivered an output value worth 11.5 billion yuan, and 82 pharmaceutical enterprises have passed the new edition GMP certification. The proportion of hi-tech industries further increased and the exportation of new and high-tech products grew by 11.1 %. Twenty-eight enterprises were newly cultivated and were recognized and identified as new and high-tech enterprises by the State throughout the year. The output value from three major industries, including pharmaceutical, electronic information, new materials and new energy, accounted for 9.9 % of that from industries above the designated scale, up 1.4 % points. In the future, in Hainan, efforts will also be made to actively cultivate and develop the internet industry and the animation industry, accelerate cooperation with leading enterprises including Tencent, Alibaba and Zhongguancun, introduce a slew of electronic information industry projects including Microsoft, HP, Indian NIIT, and vigorously make Haikou Pharmaceutical Valley large and strong.⁷

Modernization of the Service Industry Was Accelerated

The added value from Shenzhen's modern service industry grew to 549,237 million yuan, an increase of 12.6 % compared with the previous year. The service industry chain and value chain were further moved to the high end, and new business types have emerged. In Shenzhen, 80 million yuan are provided to support service outsourcing and the development of the trade in services industry every year; an obvious service outsourcing demonstration effect can be seen; software exports ranked No.1 nationwide for many consecutive years. Currently, Shenzhen has been home to more than 80 % of the supply chain enterprises nationwide, and a host of leading enterprises, including Lang Hua, Eternal Asia, YH Global, Xinlikang, Everich, Onetouch and Prolto. Rapid development of these enterprises has improved Shenzhen's capability for logistics services. Innovative financial institutions in Shenzhen can be funded by 1–5 million yuan. The financial industry has played an increasingly important role in supporting industries. In Shenzhen, 20 million yuan are also offered in support of the development of the convention and exhibition industry every year. Twelve brands in Shenzhen including China Public Security Expo, International Cultural Industry Fair and China International Optoelectronic Expo have passed certification from the Union des Foires Internationales (UFI) and ranked No.3 nationwide. As an important part of the productive service industry in Shenzhen, the convention and exhibition industry has greatly stimulated the development and expansion of such industries as electronic

⁷Liang Zhenjun, et al., The Output Value from Strategic Emerging Industries Hit 60 Billion Yuan in Hainan Province in 2013. www.sme.gov.cn, January 23, 2014.

information, machinery, jewelry, garments, clock and watch and underwear in Shenzhen. The soaring modern service industry in Qianhai has injected a new vitality into Shenzhen's modern service industry.

The added value of Zhuhai's modern service industry was 44,164 million yuan, up 10.3 %, accounting for 26.6 % of the GDP. Cargo throughput at main ports grew by 29.5 %, to 100.24 million tons. Port container throughput increased by 7.6 % to 872,600 TEUs. Domestic tourists increased by 4.5 %, to 24,239,000 person-times, among whom overnight tourists grew by 0.08 %, to 13,089,000 person-times. Income from domestic tourism rose by 8.0 %, to 18,992 million yuan. The total income from tourism increased by 2.5 %, to 24.18 billion yuan. The year-end balance of domestic and foreign currency deposits at domestic and foreign financial institutions in the banking industry throughout this city increased by 19.5 %, to 412,158 million yuan. The year-end balance of domestic and foreign currency loans from domestic and foreign financial institutions in the banking industry throughout this city increased by 7.9 %, to 207,190 million yuan. Although Zhuhai's high-end service industry has improved somewhat, its advantages are still not prominent; it still lacks innovations and the level of service industry agglomerations is still relatively low and it fails to effectively support industrial transformation and upgrading. According to the *Development Plan of Zhuhai City for the High-end Service Industry (2013–2020)*, the direction and key task for developing the high-end service industry in Zhuhai lie in focusing on six major fields, including leisure tourism, financial services, commerce and trade logistics, international conventions and exhibitions, culture creativity, science and technology services. In May, 2013, *Several Policy Opinions of Zhuhai City Concerning Promoting Development of the Hi-end Service Industry* was released in Zhuhai; it ensures key support for the high-end service industry regarding six major aspects including optimizing the developmental environment, strengthening talent introduction and cultivation, increasing fund support, pushing ahead with project services, reinforcing land guarantees and expanding taxes and dues preference; thus Zhuhai's high-end service industry will show a more robust development.

Shantou's modern service industry investments continued to show a high growth by 25.1 %. The commodity supermarket, Zhengda Distribution Center and the international toy mall were being built in an expedited way in Baoao Logistics City. Shantou's financial supermarket was completed and put into operation. The development of the financial industry accelerated somewhat. Eight financial institutions including the Hang Seng Bank and the Bank of East Asia were added. The balance of domestic and foreign currency deposits at financial institutions (including foreign ones) was 253,016 million yuan, up 10.7 % compared with the beginning of the year. The balance of domestic and foreign currency loans from financial institutions (including the foreign ones) was 97,193 million yuan, up 19.7 % compared with the beginning of the year. Among medium and long-term RMB loans from financial institutions (including the foreign ones), personal consumption loans amounted to 11,078 million yuan, up 15.0 % compared with the

beginning of the year. In 2013, the tourism industry developed rapidly and over-night tourists increased by 11.0 % compared with the previous year, among whom international tourists and domestic tourists increased by 5.0 and 11.1 % respectively. The total income from tourism rose to 14,701 million yuan, up 18.7 %, among which foreign exchange earnings from tourism increased by 4.9 %, to 54,305,800 USD.

Xiamen's modern service industry continuously developed. There was rapid development of the shipping logistics industry and the tourism, convention and exhibition industries. Port cargo throughput, container throughput and airport passenger throughput grew by 10.8, 11.2 and 13.8 % respectively. The number of tourists and income from tourism increased by 13.1 and 15 % respectively. The Stone Material Show and the Buddhist Items & Crafts Fair became the largest ones in this industry in the world, with an exhibition area hitting 1.6 million m². The total sales revenue from the software and information service industry was 59.17 billion yuan, up 28.3 %. The balance of domestic and foreign currency deposits at and loans from domestic and foreign financial institutions increased by 16.6 and 14.4 % respectively. Cross-strait Equity Exchange was officially put into operation. Preparations were made to establish the first cross-strait full-license securities joint venture in which 51 % of the equity is held by Taiwanese investors. Nine municipal-level headquarter enterprises, Haixi Headquarters of the China Communications Construction Company, NetDragon Websoft R & D Center, etc. were recognized and identified to settle in Xiamen. The development of the cultural industry accelerated. It was awarded the title of national cultural and technological fusion demonstration base, and three provincial-level cultural industry demonstration bases were added. The Phase II project for Fujian-Taiwan (Xiamen) Cultural Industrial Park was launched. Renovation projects, including the Longshan Cultural and Creative Industrial Park and the Cross-Strait Architectural Design Cultural and Creative Industrial Park, were smoothly promoted. Major projects, including the Xiamen International Artwork Financial Exchange and the Lingling International Circus City, were carried out in a more expeditious way.⁸

The service industry delivered an added value worth 151,870 million yuan in Hainan in 2013, contributing 57.7 % to economic growth and constituting the main force for driving economic growth. The financial industry realized an added value worth 15,164 million yuan, contributing 12.7 % to the growth of the service industry. The year-end balance of domestic and foreign currency deposits at and domestic and foreign currency loans from financial institutions was 595,250 million yuan and 463,078 million yuan, up 16.4 and 18.9 % respectively. Securities and futures trading totaled 7839,442 million yuan, up 86.9 % compared with the previous year. The total income from tourism increased by 13.0 %, to 42,856 million

⁸The Xiamen Municipal Development and Reform Commission, Report of Xiamen City on the Execution of the National Economic and Social Development Plan in 2013 and the Draft Plan for the National Economic and Social Development in 2014. <http://www.xm.gov.cn>, January 28, 2014.

yuan compared with the previous year. The tourism industry delivered an added value worth 22,996 million yuan, up 11.3 % compared with the previous year. Cruise tourism rapidly rose, boosting the development of marine tourism. Three national Grade 4A tourism attractions, Dongshanling Cultural Tourism Area, Xinglong Tropical Garden Tourism Area and Sanya Yalongwan Tropical Paradise Forest Tourism Area, were added.

Open Innovations Enhanced the Capability for Industrial Innovation

In 2013, 591 enterprises were recognized and identified as new & high-tech enterprises by the State in Shenzhen, and research and development input in the whole society accounted for 4 % of the GDP. Huawei Company became the first Chinese company to be listed among the top 50 enterprises in the world in terms of research and development expenditure and strode forward as a leader in technical innovation. Sixty-six major projects for technological breakthroughs were organized. One hundred and seventy-six national, provincial and municipal key laboratories, engineering centers, engineering laboratories, technical centers, etc. were added, while the cumulative number of such laboratories, engineering centers, engineering laboratories, technical centers, etc. reached 955. Industry-university-research-capital alliances concerning 3D display and big data, etc. were newly established. Open innovations accelerated. Thirty-one overseas research and development business enterprises were added. Ten overseas high-level innovation teams were newly introduced. PCT international patent applications exceeded 10,000, accounting for 48.1 % of the national number. The number of applications for three patents which were accepted for handling and were granted was 80,657 and 49,756, up 10.3 and 2.2 % respectively. Four Chinese patent gold awards were won in 2013, accounting for 20 % of the national number.

In Zhuhai, the capability for research and development improved; scientific and technological enterprises became larger and 63 national new & high-tech enterprises were added; the total number of provincial and municipal engineering centers and corporate technical centers reached 287. Research and development input in the whole society accounted for 2.52 % of the GDP. Zhuhai was rated as the national advanced city for scientific and technological progress seven consecutive times. There were applications for 8017 patents in 2013, up 12.96 %. The proportion of applications for invention patents and utility model patents, mostly reflecting a capability for innovation, increased to 82.62 %, 21 % points higher than the average for Guangdong Province. Enterprises applied for 7037 patents, accounting for 88 % of total patent applications in the whole city, ranked No.1 in Guangdong Province in terms of proportion. Invention patent applications filed by booming key backbone enterprises made up an increasing proportion of those for the whole city,

among which invention patent applications filed by Gree Electric Appliances Inc accounted for 41.4 % of the number in Zhuhai and the percentage filed by the top ten enterprises in terms of invention patent applications accounted for 59.14 % of the invention patent applications in Zhuhai. There were 1919 valid invention patents, up 427 more, which was 28.62 % more, compared with the previous year.⁹ Zhuhai ranked No. 2 in Guangdong Province in terms of invention patent applications per one million people, and research and development personnel per one million people. The *Talent Development Promotion Regulations* was released in Zhuhai to attract a crop of high-level personnel studying abroad to Zhuhai for starting businesses; this brought a group of top-notch innovation teams and leading talents specializing in 3D printing and including Vimicro etc., to join other high-caliber talent teams to develop an agglomeration.

Shantou has been among the top in Guangdong Province in terms of patent output and in terms of the number of provincial science and technology awards won. In 2013, there were 11,000 patent applications and 6833 granted patents, up 5.9 and 3.8 % compared with the previous year, respectively. Sixty-seven technical contracts were signed and technology transactions amounted to 84,618,800 yuan. In Shantou, the group of scientific and technological enterprises continued to expand, with 802 private scientific and technological enterprises, up 4.0 %. There were three national innovative enterprises, ranking Shantou No. 3 among prefecture-level cities in Guangdong Province. There were 15 provincial innovative enterprises and 8 provincial pilot innovative enterprises, which played the role of science and technology in supporting economic and social development. Innovative scientific research teams were vigorously introduced. In 2013, innovative scientific research teams introduced by four enterprises including Shantou Huaxing Metallurgical Equipment Co., Ltd. were included in the provincial Yangfan Program and obtained a support fund worth 32 million yuan. Innovative scientific research teams introduced by Ecota Environmental Technology Co., Ltd and Guangdong Guanghua Sci-Tech Co., Ltd. were successfully included in the Pearl River Talent Program and were provided with support funds worth 30 million yuan.¹⁰

In Xiamen, new and high-tech enterprises realized an output value worth 209.9 billion yuan, accounting for 44.9 % of the total industrial output value. One hundred and four new and high-tech enterprises were newly recognized and identified, bringing the total number to 820, including 28 key new and high-tech enterprises under the China Torch Program, 184 innovative enterprises, and 14 national innovative enterprises. There were 83 engineering technology research centers, 12 sci-tech enterprise incubators, 152 enterprise technology centers, 12 strategic

⁹Journalist of *Zhuhai Daily*, Enterprises Applied for 7,037 Patents in Our City Last Year, Accounting for 88 % of the Total Patents in the Whole City, Making Our City Ranked No.1 in terms of the Proportion in the Whole Province, http://www.zhuhai.gov.cn/xxgk/xwzx/zhyyw/201403/t20140301_5561603.html, March 1, 2014.

¹⁰Nie Jinxiu, Luo Mian, The Group of National Innovative Enterprises Continued to Expand in Shantou City, www.chinadevelopment.com.cn, June 3, 2014.

alliances for industrial technological innovations, 669 technology trading organizations, 51 key laboratories and 23 postdoctoral workstations. Scientific research institutions, including the Advanced Composite Material Industry Technology Research Institute, were established. One hundred and thirty-five projects were approved and initiated under the National Science and Technology Program. There were six national specialty industry bases, including tungsten material, audiovisual communication, semiconductor lighting, software, biological and new medicine and electrical appliances. There were 248 PCT international patent applications, 11,162 domestic patent applications and 8255 granted domestic patents, including 2971 invention patent applications and 890 granted invention patents, with 9.17 invention patents per one million people. The number of technology contracts that were registered was 2688; the contract amount totaled 3.11 billion yuan.

In Hainan, there are cumulative 127 enterprises recognized and identified as new & high-tech enterprises by the State. In 2013, 28 new and high-tech enterprises were added. In 2013, there were 2358 patent applications and 1331 granted patents. Eleven key provincial laboratories and 3 provincial engineering technology research centers were added. In Hainan, 1 project under the 863 Program, 8 projects under the China Torch Program, 4 projects under the National Sci-Tech Support Plan, 150 projects under the National Natural Science Foundation, 8 projects under the National Spark Program, 4 international scientific and technological cooperation projects under the Ministry of Science and Technology, 21 projects under the Innovation Fund for Technology-Based Firms, 10 projects under the National Agriculture Science Technology Achievement Transformation Fund were implemented. Seventy-six scientific and technological achievements were granted the Scientific and Technological Progress Award and the Achievement Transformation Award of Hainan Province.¹¹

Analysis of the Development Capability for the Industrial Transformation of the Special Economic Zones

Transformation and upgrading is currently the common strategy for leading the economic development of five special economic zones. The developmental paths for special economic zones show that factors including different locations, starting points of industrial bases, institutional arrangements, etc. have determined the development capability for industrial transformation of different special economic zones and different paths for the industrial development of China's special economic zones.

¹¹Hainan Provincial Bureau of Statistics, Survey Office of the National Bureau of Statistics in Hainan Province, Statistical Bulletin on the National Economic and Social Development of Hainan Province in 2013, January 24, 2014.

Overall Comparisons of the Capability for Industrial Transformation Among the Special Economic Zones

From the perspective of industrial form, industrial transformation entails the process for high-end development of multiple aspects, including structure, organization, technology, etc.; from the perspective of factor allocation, industrial transformation is the process in which productive forces, including capital, labor, etc., shift from declining industries to emerging industries under certain conditions of market demand. Within a certain period of time, the differences in capability for industrial transformation among the special economic zones are mainly reflected in differences in the industrial growth rate, the conversion level of the industrial structure and the degree of trade mode transformation.

1. Comparisons of industrial growth among the special economic zones

In 2013, the regional GDP in Shenzhen, Shantou, Zhuhai, Xiamen and Hainan was 1450,023 million yuan, 156,590 million yuan, 166,238 million yuan, 301,816 million yuan and 314,646 million yuan, up 10.5, 10, 10.5, 9.40 and 9.90 % respectively. The regional GDP in Shenzhen was 1.5 times that in Shantou, Zhuhai, Xiamen and Hainan combined.

In order to depict the overall difference in industrial growth among the different special economic zones, below, a variable coefficient is cited to measure the degree of difference among Shenzhen, Shantou, Zhuhai, Xiamen and Hainan. A specific calculation formula for the variable coefficient is shown below:

$$CV = \frac{\delta}{\bar{X}}, \quad \delta = \sqrt{\sum_{i=1}^n \frac{(x_i - \bar{x})^2}{n}}$$

where, δ is the standard deviation, which is the arithmetic square root of the average of the squared deviations of the variable values in the sample from their average value and can accurately reflect the dispersion degree of regional economic indicators; \bar{x} is the average value of the sample, n is the sample size, x_i is the sample value for Region i ; the standard deviation is compared with the average value in order to eliminate the impact from different base numbers (Fig. 2.1).

In 2013, the variable coefficient of the regional GDP in five major special economic zones was 102.65 %, indicating an extremely wide difference in industrial scale among the five special economic zones. The variable coefficient of the regional GDP in the five major special economic zones in 2012 was 101.31 %, slightly lower than that of 2013, suggesting an increasing trend in the overall difference in industrial scale among the major special economic zones.

In 2013, the variable coefficient of the regional GDP growth rate in the five major special economic zones was 4.10 %, showing a relatively small difference in the growth rate of the industrial scale among the five special economic zones. The variable coefficient of the regional GDP growth rate in the five major special

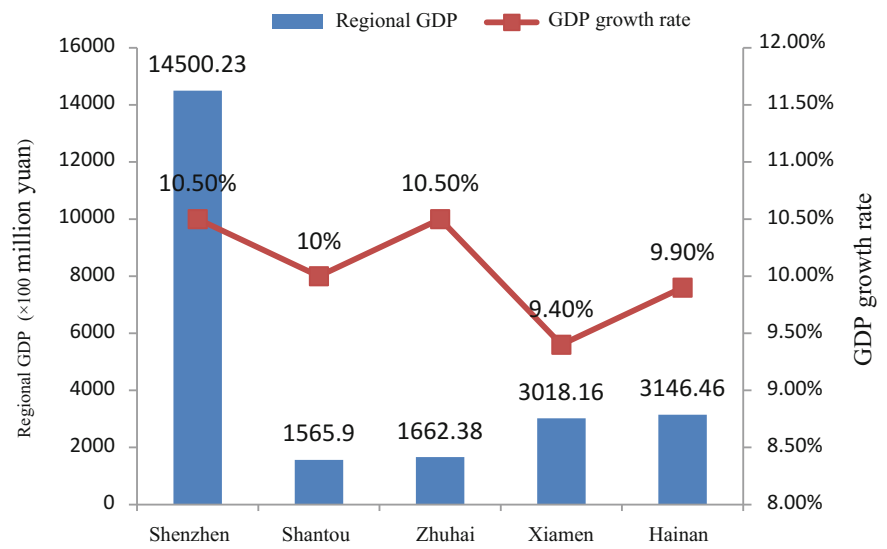


Fig. 2.1 Comparisons of regional GDP and growth rate among five major special economic zones in 2013

economic zones in 2012 was 17.17 %, significantly higher than that of 2013, suggesting a decreasing trend in the overall difference in the growth rate of the industrial scale among the major special economic zones (Fig. 2.2).

In the case of industry, Hainan’s primary industry was the largest one, 4.56 times combined scale of that in Shenzhen, Shantou, Zhuhai and Xiamen; Shenzhen’s secondary industry and tertiary industry were the largest ones, 1.59 and 1.81 times the combined scale of that in Shantou, Zhuhai, Xiamen and Hainan respectively (Fig. 2.3).

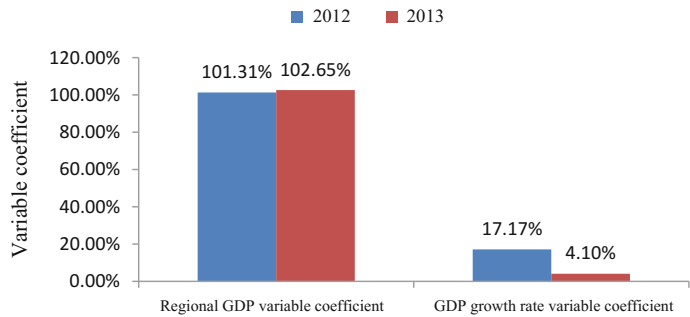


Fig. 2.2 Comparisons of the regional GDP variable coefficient and the GDP growth rate variable coefficient in the five major special economic zones between 2012 and 2013

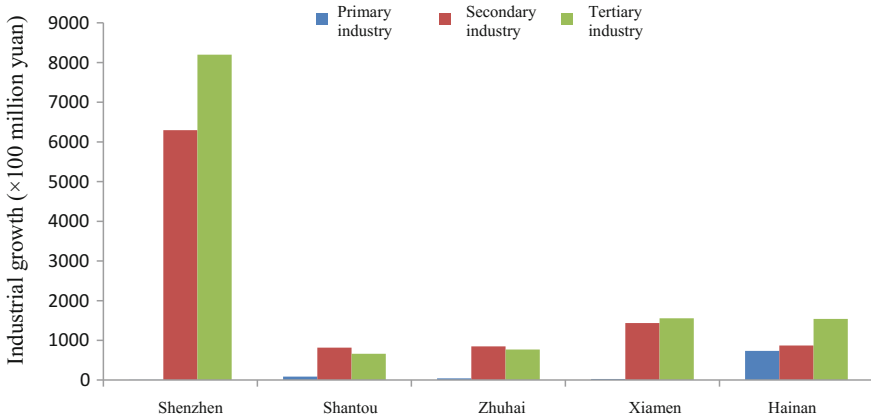


Fig. 2.3 Comparisons of the scales of the primary industry, the secondary industry and the tertiary industry in the five major special economic zones in 2013

All of the variable coefficients of the scales of the output value of the primary industry, the secondary industry and the tertiary industry in the five major special economic zones were higher than 100 %, indicating a relatively large difference in the scales of the primary, the secondary and the tertiary industries among the special economic zones. Furthermore, with respect to the trend, the variable coefficient of the output value from the primary industry in the five major special economic zones in 2013 was slightly lower than that in 2012, suggesting a gradually decreasing difference in the output value from the primary industry among the five major special economic zones. On the contrary, with regard to the trend, all the variable coefficients of the scales of the secondary and the tertiary industries in the five major special economic zones in 2013 were higher than those in 2012, suggesting an increasing difference in the scales of the secondary and the tertiary industries among the five major special economic zones. In 2013, Shenzhen’s primary industry growth rate greatly declined; as a result, the variable coefficient of the growth rates of the primary industry in the five major special economic zones became negative and was much higher than 1000 %, suggesting an extremely wide difference in the growth rate of the primary industry among the five major special economic zones. The growth rates of both the secondary and tertiary industries were 30 % lower than the growth rate of the primary industry, and the variable coefficients of both the secondary and the tertiary industries fell somewhat in 2013, suggesting a gradually decreasing difference in the growth rates of the secondary and tertiary industries among the five major special economic zones (Fig. 2.4).

2. Comparisons of the conversion levels of the industrial structure among the special economic zones

For the structure of the three industries, the ratio of the primary industry to the secondary industry and the tertiary industry in Shenzhen in 2013 was adjusted from

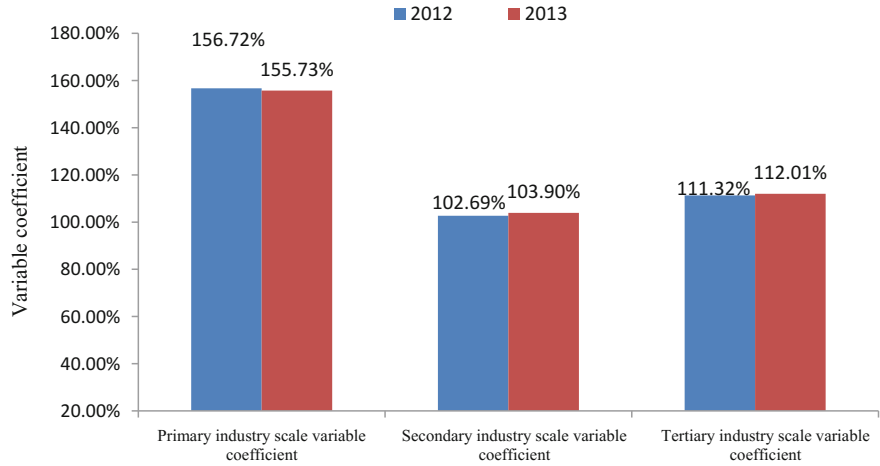


Fig. 2.4 Comparisons of the variable coefficients of the scales of the primary industry, secondary industry and tertiary industry in the five major special economic zones between 2012 and 2013

0.04:44.31:55.65 in 2012 to 0.04:43.43:56.54, while that in Shantou in 2013 was adjusted from 5.81:51.50:42.69 in 2012 to 5.57:52.22:42.21, and that in Zhuhai in 2013 was adjusted from 2.58:52.95:44.47 in 2012 to 2.59:51.07:46.33, and that in Xiamen in 2013 was adjusted from 0.89:48.77:50.33 in 2012 to 0.86:47.54:51.60, and that in Hainan in 2013 was adjusted from 24.92:28.15:46.94 in 2012 to 23.39:27.66:48.95. The proportion of the secondary industry in Shenzhen, Zhuhai, Xiamen and Hainan, except Shantou, among the five major special economic zones decreased by varying degrees, while that of the tertiary industry increased by varying degrees. The proportion of the primary industry in Shenzhen in 2013 was the same as that in 2012, while that of the primary industry in Shantou rose somewhat and that in all three of the other special economic zones declined compared with 2012 (Fig. 2.5).

Among the five special economic zones, Shenzhen and Xiamen have the following three-industry structure: tertiary, secondary, primary, in which the proportion of the tertiary industry has exceeded 50 %, suggesting that the industrial structure has evolved to a relatively advanced stage; Zhuhai and Shantou have the following three-industry structure: secondary, tertiary, primary, in which the proportion of the secondary industry has exceeded 50 %, indicating that industrialization is still at the stage of intensification; Hainan has this three-industry structure: tertiary, primary, secondary, suggesting that the evolution of the industrial structure in the special economic zones followed different developmental paths with the impact from special factor endowment, location and other factors.

In order to better describe the overall change the the three-industry structure in the special economic zones, the change value of the industrial structure of the special economic zones C_{ij} can be calculated. Taking $C_{ij} = \sum |Q_{ij1} - Q_{ij0}|$, where, Q_{ij} is the proportion of Industry j in all of the industries in the special economic

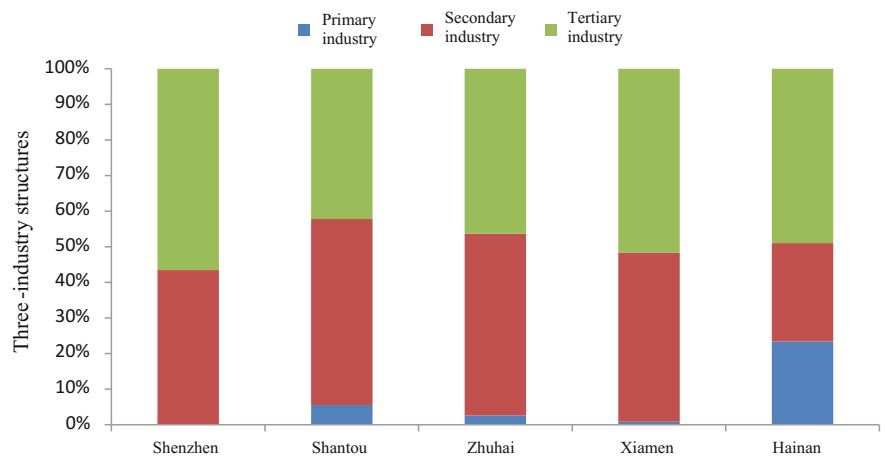


Fig. 2.5 Comparisons of three-industry structures in the five major special economic zones in 2013

zone i , while subscripts 0 and 1 represent 2012 and 2013 respectively. The higher the C_{ij} value is, the higher the degree of change in the industrial structure in the special economic zone, vice versa.

According to the results of the calculation, the change values of the industrial structure in Shenzhen, Shantou, Zhuhai, Xiamen and Hainan in 2013 compared with 2012 were 1.77, 1.44, 3.75, 2.54 and 4.03 % respectively. This shows that Hainan witnessed the fastest change in industrial structure in 2013, successively followed by Zhuhai, Xiamen and Shantou. The change value of the industrial structure in each of the five major special economic zones declined compared with the previous year, while the largest drop occurred in Shantou where, in 2013, it was only 1/4 of what it was in 2012 (Fig. 2.6).

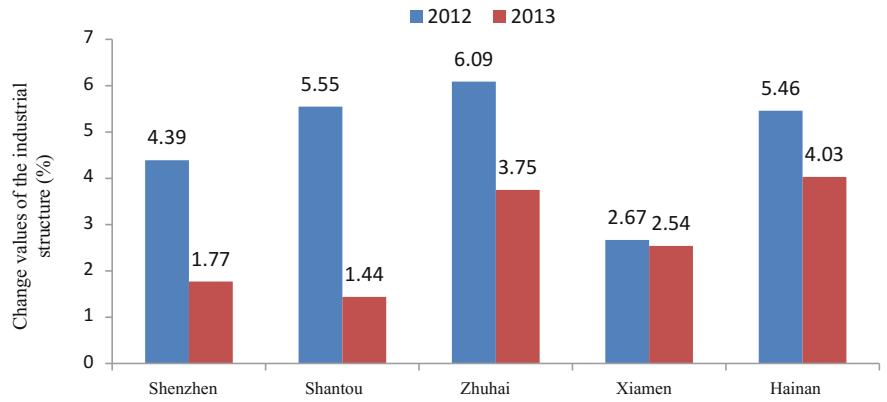


Fig. 2.6 Comparisons of the change values of the industrial structure in the five major special economic zones between 2012 and 2013

Besides the overall change in the industrial structure in the five major special economic zones, in order to understand the directions for and the intensities of the three-industry changes in the special economic zones, the change trend value B_{ij} of the industrial structure also needs to be calculated; taking $B_{ij} = \frac{Q_{ij1}}{Q_{ij0}}$, when B_{ij} is more than 1, the proportion of Industry j in the special economic zone i increases, namely, Industry j shows a relative expansion; when B_{ij} is equal to 1, the proportion of Industry j is unchanged; when B_{ij} is less than 1, the proportion of Industry j decreases, the industry shows a relative contraction. The longer the distance between B_{ij} and 1 is, the higher the intensity of Industry j expansion or contraction is; vice versa.

According to the results of the calculation, the average value of the three-industry change trends shows that among the five major special economic zones, Shantou and Zhuhai witnessed an expansion of the primary industry, while Shenzhen, Xiamen and Hainan presented a contraction of the primary industry; Shantou, Zhuhai and Xiamen witnessed an expansion of the secondary industry, while Shenzhen and Hainan experienced a contraction of the secondary industry; Shenzhen, Xiamen and Hainan underwent an expansion of the tertiary industry, while Shantou and Zhuhai experienced a contraction of the tertiary industry.

The average value of the three-industry change trends in the five major special economic zones in 2013 increased compared with 2012, indicating an overall expansion of the three industries in the five major special economic zones in 2013. With respect to industry, the primary industry expanded at the fastest pace from 2012 to 2013, successively followed by the secondary industry and the tertiary industry, while the average value of the three-industry change trends in 2013 was basically the same as that in 2012 (Figs. 2.7 and 2.8).

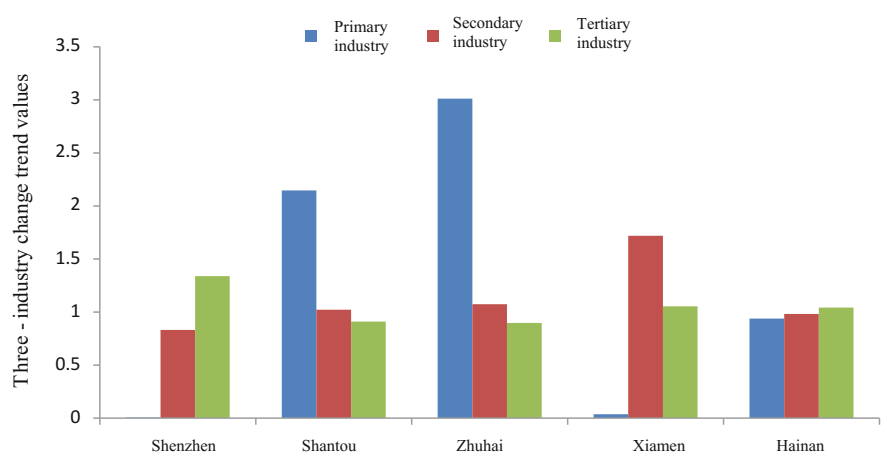


Fig. 2.7 The three-industry change trend values in the five major special economic zones in 2013

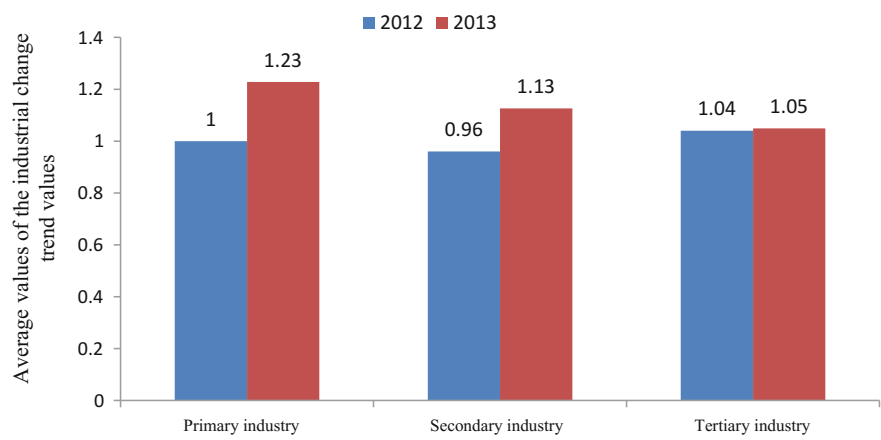


Fig. 2.8 Comparisons of the average values of the industrial change trend values in the five major special economic zones between 2012 and 2013

Analysis of the Transformation of the Manufacturing Industry in the Special Economic Zones

1. Comparisons of the growth of the manufacturing industry in the special economic zones

In 2013, the industrial added value from enterprises in Shenzhen, Shantou, Zhuhai, Xiamen and Hainan was 569.5 billion yuan, 75,193 million yuan, 77,557 million yuan, 121,217 million yuan and 55,111 million yuan, up 9.60, 12.60, 10.60, 11.90 and 6.40 % respectively. The industrial added value from enterprises in Shenzhen was 7.57 times, 7.57 times, 4.70 times and 10.33 times that in Shantou, Zhuhai, Xiamen and Hainan respectively, while in 2012, the industrial added value from enterprises in Shenzhen was 7.62 times, 7.62 times, 4.20 times and 9.77 times that in Shantou, Zhuhai, Xiamen and Hainan respectively. This shows that the gap in the industrial added value among Shantou, Zhuhai and Shenzhen narrowed somewhat in 2013, while the gap in the industrial added value among Xiamen, Hainan and Shenzhen widened somewhat in 2013 (Fig. 2.9).

In 2013, the variable coefficient of the enterprises’ industrial added value in the five major special economic zones was 109.11 %, showing a relatively large difference in the enterprises’ industrial added value among the five special economic zones. The variable coefficient of the enterprises’ industrial added value in the five major special economic zones in 2012 was 105.55 %, slightly lower than that in 2013, suggesting an increasing overall difference in the enterprises’ industrial added value among the major special economic zones. The variable coefficient of the growth rate of the enterprises’ industrial added value in 2013 was 7.22 % points lower than that in 2012, showing a decreasing overall difference in the growth rate

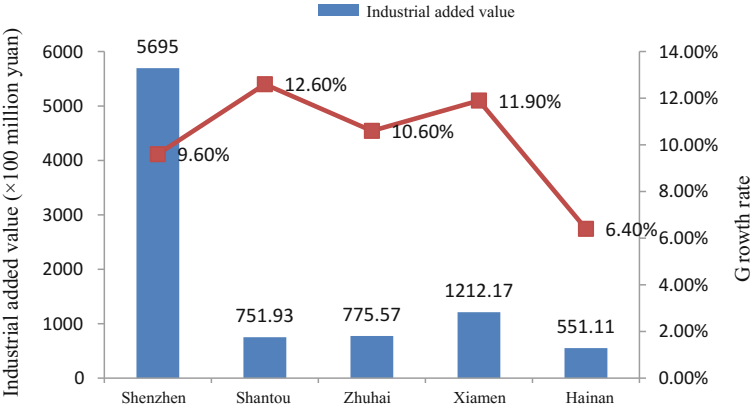


Fig. 2.9 Comparisons of enterprises’ industrial added value and growth rate in five special economic zones in 2013

of the enterprises’ industrial added value in the five major special economic zones (Fig. 2.10).

2. Comparisons of the performance of the manufacturing industry in the special economic zones

Regarding the total profit indicator concerning industrial enterprises, in 2013, the total profit from industrial enterprises in Shenzhen, Shantou, Zhuhai, Xiamen and Hainan was 134,427 million yuan, 14,550 million yuan, 29,795 million yuan, 22,453 million yuan and 12,316 million yuan, up 18.30, 19.40, 27 %, down 2.60 and 7.64 % respectively (Fig. 2.11).

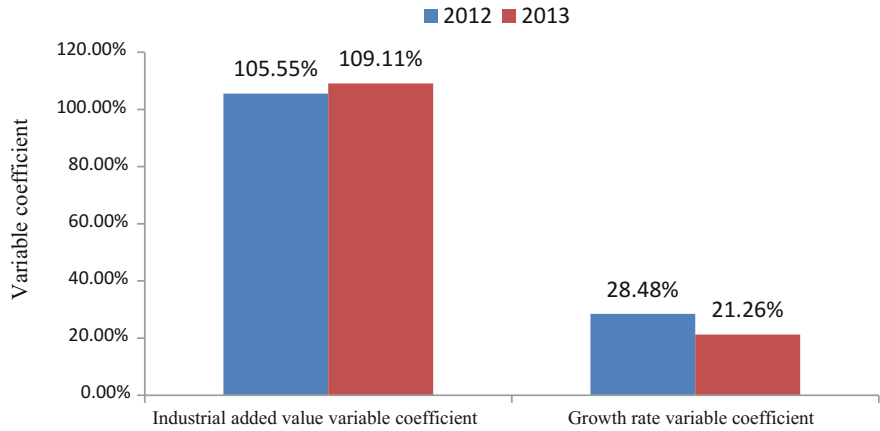


Fig. 2.10 Comparisons of the enterprises’ industrial added value variable coefficient and growth rate variable coefficient in the five major special economic zones in 2012 and 2013

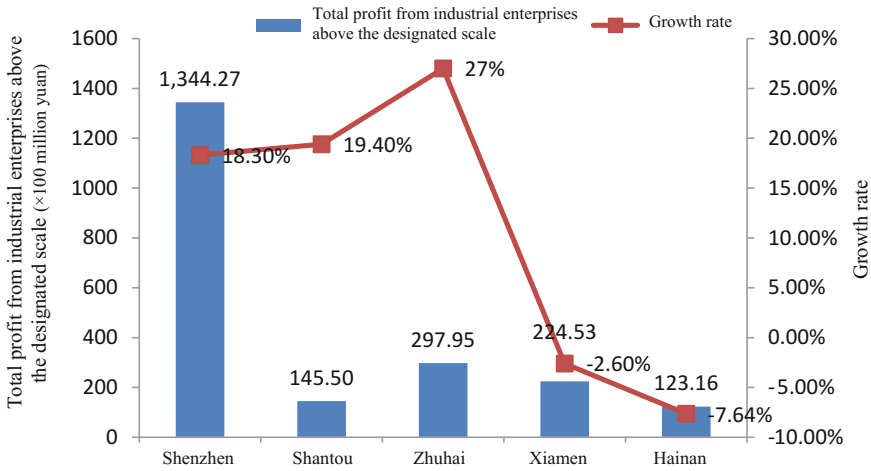


Fig. 2.11 Comparisons of the enterprises' total profit and growth rate in the five major special economic zones in 2013

Among the five major special economic zones, Shenzhen showed the highest total profit from industrial enterprises, 9.24 times, 4.51 times, 5.99 times and 10.91 times that in Shantou, Zhuhai, Xiamen and Hainan respectively. Zhuhai witnessed the fastest growth of total profits from industrial enterprises –27 %, followed by Shantou and Shenzhen –19.40 % and 18.30 % respectively, while Xiamen and Hainan experienced a negative industrial growth.

The rates of the growth of total profits from industrial enterprises in Shenzhen, Shantou, Zhuhai and Xiamen in 2013 significantly increased compared with 2012. The rates of growth of total profits from industrial enterprises in Shenzhen, Zhuhai and Xiamen changed from negative ones to positive ones, suggesting a good effect in accelerating industrial transformation in these three places. Compared with the above four special economic zones, Hainan Special Economic Zone experienced the change in total profits from industrial enterprises from positive to negative, showing a relatively high pressure in the development of industrial transformation (Fig. 2.12).

In order to further portray the “weight” of enterprise profits in unit added value from the enterprises in the special economic zones, the proportion of total profits in the industrial added value is introduced as an indicator. In 2013, the proportion of total profits in the industrial added value in Shenzhen, Shantou, Zhuhai, Xiamen and Hainan was 23.60, 19.35, 38.42, 18.52 and 22.35 % respectively. This shows that Zhuhai enjoyed the highest proportion of total profits in the industrial added value, followed by Shenzhen, Hainan, Shantou and Xiamen. The proportion of total profits in the industrial added value in Hainan skyrocketed from 1.47 % in 2012 to 22.35 % in 2013. The proportion of total profits in the industrial added value in Zhuhai soared from 20.09 to 38.42 %, while this indicator was basically stable in the other three special economic zones (Fig. 2.13).

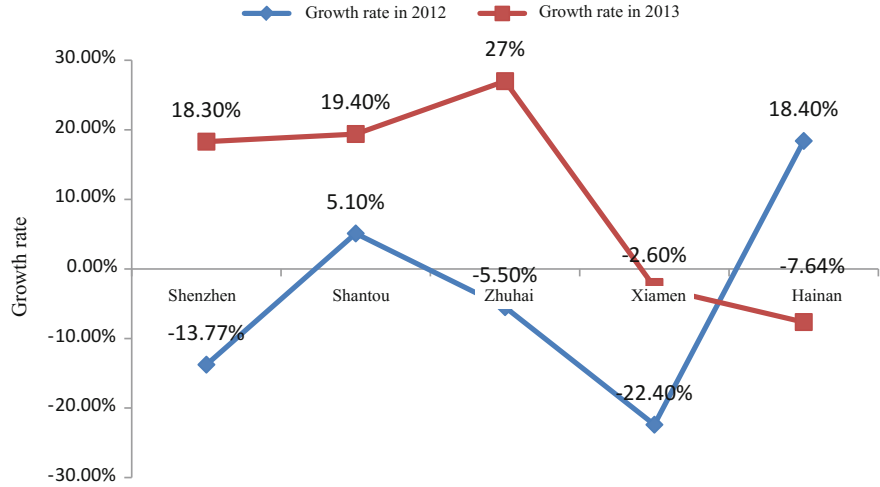


Fig. 2.12 Comparisons of the enterprises' total profit growth rate in the five major special economic zones in 2012 and 2013

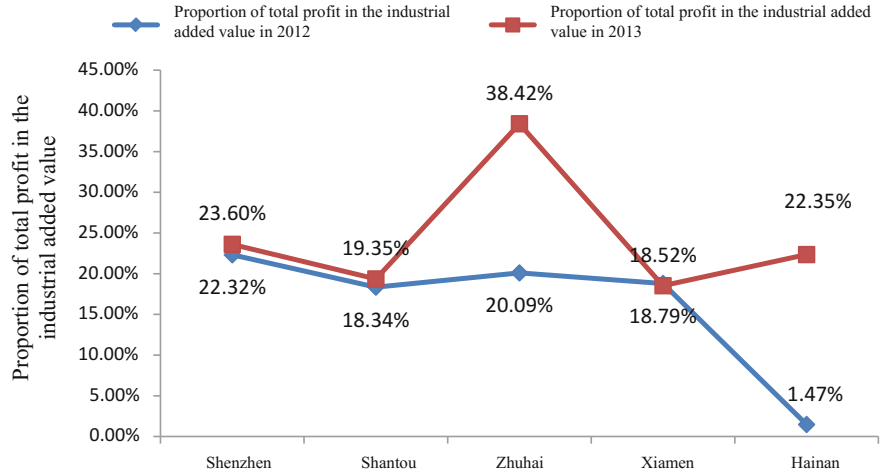


Fig. 2.13 Comparisons of proportions of total profits in the industrial added value in the five major special economic zones in 2012 and 2013

3. Comparisons of energy consumption by the manufacturing industry in the special economic zones

The industrial electricity consumption in Shenzhen, Shantou, Zhuhai, Xiamen and Hainan in 2013 was 62,583 million kWh, 10,092 million kWh, 7744 million kWh, 10,914 million kWh and 12,052 million kWh, up 1.30, 7, 12, 7.50 and 11.92 % respectively. The industrial electricity consumption in Shenzhen was 6.2

times, 8.08 times, 5.73 times and 5.19 times that in Shantou, Zhuhai, Xiamnen and Hainan respectively (Fig. 2.14).

The electricity consumption per unit industrial added value in Shenzhen, Shantou, Zhuhai, Xiamen and Hainan was 11 million kWh, 13 million kWh, 10 million kWh, 9 million kWh and 22 million kWh respectively. This shows that Xiamen witnessed the lowest electricity consumption per unit industrial added value, followed successively by Zhuhai, Shenzhen, Shantou and Hainan (Fig. 2.15).

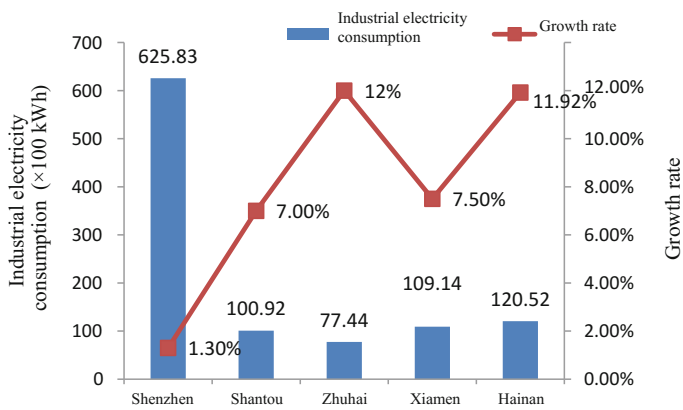


Fig. 2.14 Comparisons of industrial electricity consumption and growth rate in the five major special economic zones in 2013

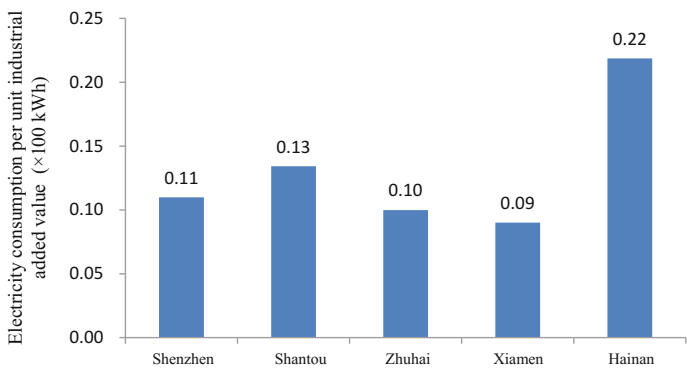


Fig. 2.15 Comparisons of electricity consumption per unit industrial added value in the five major special economic zones in 2013

4. Comparisons of investment momentum for the transformation of the manufacturing industry in the special economic zones

In 2013, with respect to fixed asset investments in the whole society, industrial investments in Shenzhen, Shantou, Zhuhai, Xiamen and Hainan were 37,728 million yuan, 40,242 million yuan, 25,426 million yuan, 27,182 million yuan and 24,471 million yuan, down 22.40 %, up 24.50, 36.20, 2.30 and 15.67 % respectively.

The growth rates of industrial investments in Shenzhen, Shantou and Hainan decreased from 9.60, 40.80 and 49.52 % in 2012 to a negative one, 24.50 and 15.67 % respectively, while that in Zhuhai and Xiamen increased from 21 and 0.89 % in 2012 to 36.20 and 2.30 % respectively. Overall, the momentum of industrial investments in Shantou, Zhuhai and Hainan was relatively good, while industrial investments in Shenzhen and Xiamen were relatively weak (Figs. 2.16 and 2.17).

For the composition and structure of fixed asset investments in the whole society, industrial investments accounted for 15.09, 51.29, 26.46, 20.17 and 8.98 % of the fixed asset investments in the whole society in Shenzhen, Shantou, Zhuhai, Xiamen and Hainan respectively. This shows that Shantou enjoyed the largest proportion of industrial investments in fixed asset investments in the whole society.

With the calculation of the change trend values regarding industrial investments in the structure of fixed asset investments in the whole society in the five major special economic zones, the change trend values for Zhuhai and Xiamen were higher than 1, while those for the other three major special economic zones were lower than 1, suggesting an expansion of industrial investments in fixed asset investments in the whole society in Zhuhai and Xiamen and a contraction of industrial investments in fixed asset investments in the whole society in Shenzhen, Shantou and Hainan (Fig. 2.18).

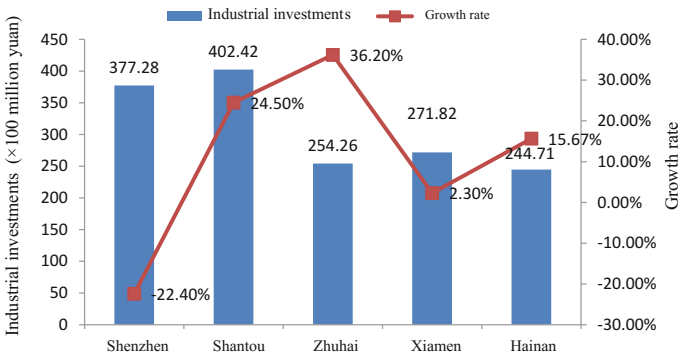


Fig. 2.16 Comparisons of industrial investments and growth rate in the five major special economic zones in 2013

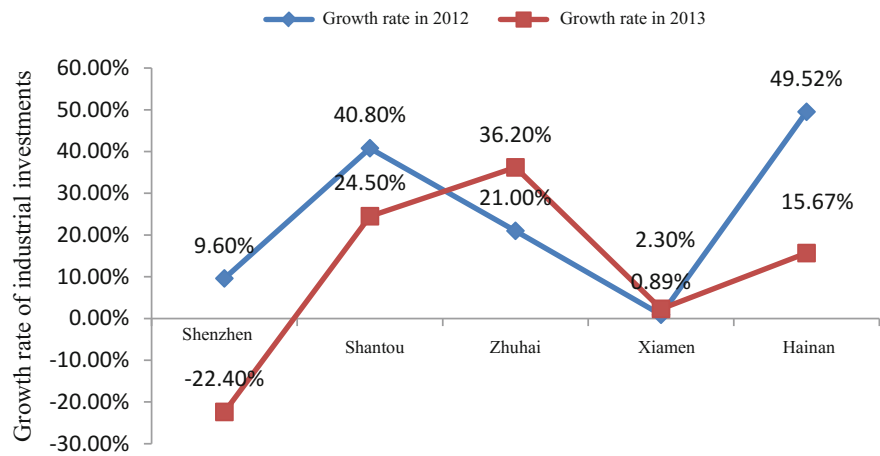


Fig. 2.17 Comparisons of the changes in the growth rate of industrial investments in the five major special economic zones in 2012 and 2013

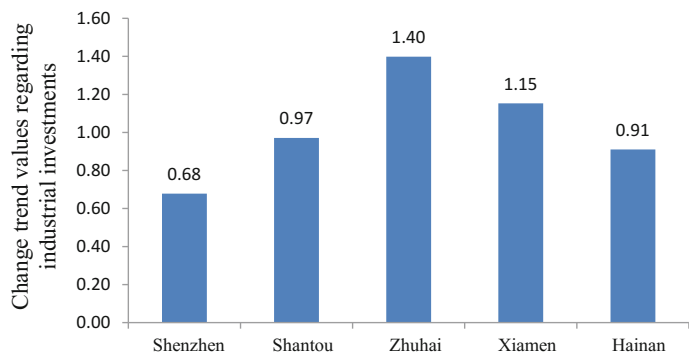


Fig. 2.18 Change trend values regarding industrial investments in the structure of fixed asset investments in the five major special economic zones in 2013

Analysis of the Transformation of the Service Industry in the Special Economic Zones

1. Comparisons of the structural changes in the service industry among the special economic zones

According to the industrial classification for national economic statistics, the service industry mainly covers the transport, warehousing and postal sector, the wholesale and retail sector, the lodging and catering sector, the financial sector, the real estate sector and other service sectors. Based on data analysis of the main sectors in the service industry in the five major special economic zones, the change

values for structural adjustment regarding the service industry in Shenzhen, Shantou, Zhuhai, Xiamen and Hainan in 2012–2013 can be calculated to obtain these results: 3.58, 2.01, 46.85, 4.06 and 3.79 % respectively. This shows that internal structural change in Zhuhai's service industry was significantly larger than that in Shenzhen, Shantou, Xiamen and Hainan.

From a sectorial perspective, with regard to the structure of the service industry, the change values for structural adjustment regarding the six main sectors in the service industry in the five major special economic zones were added together to obtain an overall structural adjustment change value regarding the six main sectors in the service industry. The structural adjustment change value regarding the other service sectors (mainly including for-profit service sectors and non- profit service sectors) was 24.60 %, the largest one, followed by that regarding the wholesale and retail sector –13.70 %, and that regarding the real estate sector –10.15 % and that for the transport, warehousing and postal sector –2.83 % (Figs. 2.19 and 2.20).

2. Comparisons of industrial changes in the service industry in the special economic zones

Based on data concerning the structure of the service industry in the five major special economic zones in 2013, industrial change trend values regarding the special economic zones can be calculated. According to the results of the calculation, the industrial change trend value regarding other service sectors was lower than 1, while that for other sectors was higher than 1, suggesting an overall expansion of sub-industries in the service industry in the five major special economic zones.

For each special economic zone, in Shenzhen, industrial trend values concerning the wholesale and retail sector and the real estate sector were higher than 1, suggesting an expansion in the structure of the service industry, while those regarding other sectors were lower than 1, signifying a contraction in the overall structure of

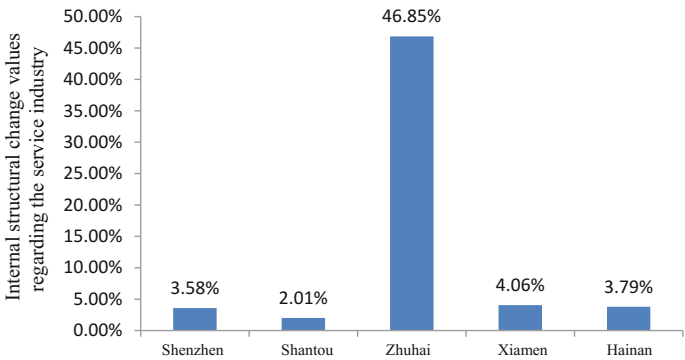


Fig. 2.19 Comparisons of internal structural change values regarding the service industry in the five major special economic zones in 2013

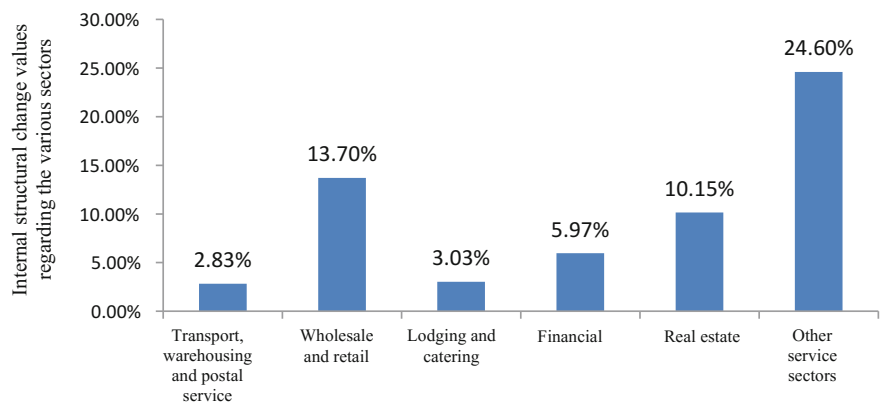


Fig. 2.20 Comparisons of internal structural change values regarding the various sectors in the service industry in the five major special economic zones in 2013

the service industry. In Shantou, industrial trend values concerning the transport, warehousing and postal sector, the wholesale and retail sector and other service sectors were higher than 1, suggesting an expansion of the structure of the service industry, while other sub-industries had a contraction. In Zhuhai, all other sub-industries, except other service sectors, expanded. In Xiamen, the lodging and catering sector, the financial sector and the real estate sector expanded, while all others contracted. In Hainan, all other sectors, except the wholesale and retail sector and the financial sector, contracted (Fig. 2.21).

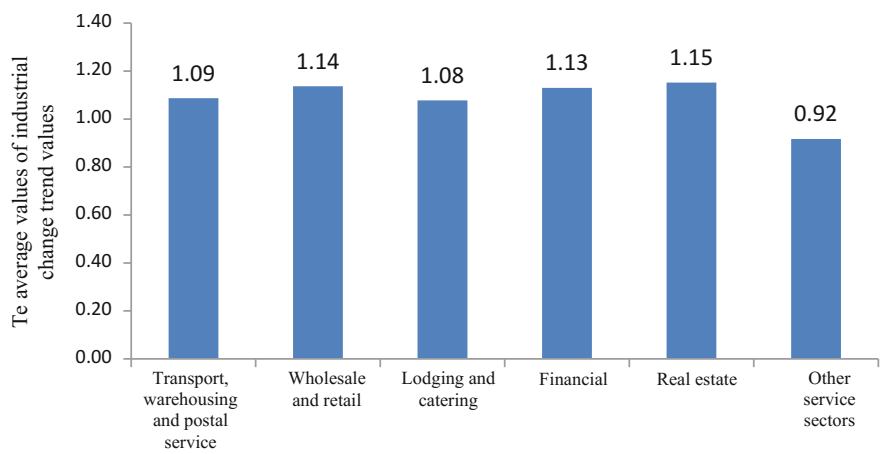


Fig. 2.21 Comparisons of the average values of industrial change trend values regarding the service industry in the five major special economic zones in 2013

Measurement of the Capability for the Development of Industrial Transformation of the Special Economic Zones

In this Paper, a quantitative evaluation indicator system for the capability for the development of industrial transformation was built to analyze the capability for the development of industrial transformation of the special economic zones, and an analytic hierarchy process was adopted to quantitatively evaluate this capability of the special economic zones.

Design of the Evaluation Indicator System and Data Source

1. **Design of the evaluation indicator system.** The capability for the development of industrial transformation represents a comprehensive embodiment of the level of industrial growth, the structural conversion level, the scale level, the performance level and support conditions—competitiveness. Based on the characterization factor regarding the level of industrial transformation, and research conducted by Yuan Yiming, Zhou Yikun, Yan Zhenkun (2013)¹² as well as the availability of data concerning the special economic zones, the industrial transformation evaluation indicator system for the special economic zones was determined, as shown in Table 2.1.
2. **Data source.** Relevant data for this evaluation indicator system mainly came from statistical bulletins of the special economic zones, *Hainan Statistical Yearbook 2014*, *Fujian Statistical Yearbook 2014*, official websites of the Guangdong Intellectual Property Office, the Xiamen Intellectual Property Office and the Hainan Intellectual Property Office, while part of data were calculated and organized by the Author according to the original data.

Results of the Analysis

Based on principal component analysis, SPSS 17.0 was used to extract common factors. As shown in Table 2.2, the characteristic values of common factors started steadily changing from the 5th one and were less than 1. The cumulative contribution rate of the first four common factors was 100 %, thus it was relatively appropriate for extracting the first four common factors.

¹²Yuan Yiming, Zhou Yikun, Yan Zhenkun, Report on the Development of Industrial Transformation of China's Special Economic Zones, *Development Report on China's Special Economic Zones (2013)* [M], Social Sciences Academic Press, April, 2014, the 1st edition, p.39.

Table 2.1 Evaluation indicator system for the capability for the development of industrial transformation of the special economic zones

Evaluation objective	Primary indicator	Secondary indicator
Evaluation system for industrial transformation capability of the special economic zones	Industrial growth level	Industrial added value growth rate
		Modern service industry growth rate
		Service industry investment growth rate
	Structural conversion level	Three-industry structural change value
		Service industry structural change value
		Secondary industry structural change trend value
		Tertiary industry structural change trend value
	Scale level	Output value from the modern service industry
		Output value from advanced industries
	Performance level	Energy consumption efficiency per unit of industrial added value of the enterprise
		The proportion of total profits in the unit industrial added value
	Relevant support conditions (market and technical innovation conditions)	New & high-tech product export trade volume
		The number of granted patents

According to the rotated principal component factor loading matrix, among the four main factors which constituted the comprehensive score, such indicators as the growth rate of the modern service industry, the output value from the modern service industry, the output value from advanced industries, new & high-tech product export trade volume, the number of granted patents had relatively heavy weight in the first factor. From the perspective of indicator attributes, these indicators were mainly concentrated on the level of industrial growth, the level of the industrial scale and transformation support conditions among primary indicators in the evaluation indicator system for the industrial transformation capability of the special economic zones. These factors were core factors for the transformation capability and can be called transformation strength factors. Transformation strength factors accounted for 35.53 % of the total variance resolution.

Table 2.2 Summary of the total variance resolutions

Component	Initial characteristic value			Extracted sum of squares weight			Rotated sum of squares weight		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	5.074	39.029	39.029	5.074	39.029	39.029	4.618	35.522	35.522
2	3.346	25.738	64.767	3.346	25.738	64.767	3.352	25.782	61.304
3	2.840	21.850	86.617	2.840	21.850	86.617	2.976	22.894	84.198
4	1.740	13.383	100.000	1.740	13.383	100.000	2.054	15.802	100.000
5	4.458×10^{-16}	3.429×10^{-15}	100.000						
6	2.481×10^{-16}	1.909×10^{-15}	100.000						
7	1.796×10^{-16}	1.382×10^{-15}	100.000						
8	1.040×10^{-16}	7.998×10^{-16}	100.000						
9	-7.209×10^{-17}	-5.545×10^{-16}	100.000						
10	-1.263×10^{-16}	-9.717×10^{-16}	100.000						
11	-1.643×10^{-16}	-1.264×10^{-15}	100.000						
12	-2.546×10^{-16}	-1.959×10^{-15}	100.000						
13	-5.918×10^{-16}	-4.552×10^{-15}	100.000						

The structural change value for the service industry, the structural change trend value for the tertiary industry, the proportion of total profits in the unit industrial added value had a relatively heavy weight in the second factor. From the perspective of indicator attributes, these indicators were mainly concentrated on structural conversion level and the performance level in the evaluation indicator system for the industrial transformation capability of the special economic zones. These indicators were a further embodiment of the core factors for the transformation capability and can be called transformation power factors. Transformation power factors ranked only second to transformation strength factors in terms of their contribution to the total variance resolution and accounted for 25.78 % of the total variance resolution.

The growth rate of industrial added value, the growth rate of service industry investments, energy consumption efficiency per unit of industrial added value of the enterprise had a relatively heavy weight in the third factor. These indicators were mainly concentrated on the level of industrial growth and on the level of performance in the evaluation indicator system for the industrial transformation capability of the special economic zones. These indicators mainly reflected the potential for industrial transformation and can be called transformation potential factors. Transformation potential factors accounted for 22.89 % of the total variance resolution.

The three-industry structural change value and the secondary industry structural change trend value had a relatively heavy weight in the fourth factor. These indicators were mainly concentrated on the structural conversion level among primary indicators. These indicators can be called transformation vitality factors. Such factors accounted for 15.80 % of the total resolution.

Based on score matrix and common factor score results, score expressions for factors were obtained as follows:

$$\begin{aligned}
 F_1 &= 0.034X_1 + 0.087X_2 - 0.061X_3 - 0.065X_4 + 0.009X_5 - 0.077X_6 + 0.0002X_7 \\
 &\quad + 0.212X_8 + 0.219X_9 + 0.103X_{10} + 0.048X_{11} + 0.222X_{12} + 0.222X_{13} \\
 F_2 &= 0.036X_1 + 0.005X_2 + 0.018X_3 + 0.076X_4 + 0.305X_5 - 0.177X_6 + 0.297X_7 \\
 &\quad - 0.002X_8 - 0.010X_9 + 0.060X_{10} + 0.323X_{11} + 0.014X_{12} + 0.038X_{13} \\
 F_3 &= 0.338X_1 - 0.273X_2 + 0.029X_3 - 0.191X_4 + 0.028X_5 + 0.159X_6 + 0.044X_7 \\
 &\quad - 0.015X_8 + 0.039X_9 + 0.290X_{10} - 0.016X_{11} + 0.028X_{12} + 0.040X_{13} \\
 F_4 &= -0.134X_1 + 0.033X_2 - 0.473X_3 + 0.295X_4 - 0.056X_5 + 0.383X_6 - 0.051X_7 \\
 &\quad + 0.017X_8 + 0.063X_9 + 0.165X_{10} - 0.076X_{11} + 0.021X_{12} - 0.057X_{13}
 \end{aligned}$$

Indicator values for the five major special economic zones were substituted into the above equations and then factor scores were calculated, and the contribution rates of common factor variances in the total variance resolution table were used to build a comprehensive evaluation model:

$$F = 0.35522F_1 + 0.25782F_2 + 0.22894F_3 + 0.15802F_4$$

Factor scores were substituted into the above equation to arrive at a comprehensive score for the industrial transformation capability of the five major special economic zones (see Tables 2.3, 2.4 and 2.5).

Conclusions About the Evaluation of the Industrial Transformation Capability of the Special Economic Zones

Score values from the quantitative analysis clearly show that Shenzhen ranked No.1 among the five major special economic zones in terms of comprehensive scores regarding industrial transformation capability, followed successively by Zhuhai, Xiamen, Shantou and Hainan. Compared with the comprehensive scores regarding industrial transformation capability of the five major special economic zones in 2012,¹³ Xiamen fell from second place to third place in terms of industrial transformation capability in 2013, suggesting that Xiamen's industrial transformation capability declined somewhat, while Zhuhai rose from third place to second place in terms of industrial transformation capability in 2013, indicating that Zhuhai's industrial transformation capability improved somewhat.

With regards to the four main factors which constituted the comprehensive score, each special economic zone enjoyed respective advantages in the four factors with respect to scoring. For example, although Shenzhen had the highest comprehensive score and transformation strength score, Shenzhen's transformation power, transformation potential and transformation vitality were insufficient, and its three factor scores were negative in the comprehensive evaluation system.

Regarding the indicator components in factor composition, indicators such as the growth rate of the modern service industry, the output value from the modern service industry, the output value from advanced industries, new and high-tech product export trade volume, and the number of granted patents had a relatively heavy weight in the transformation strength factor. In Shenzhen in 2013, the added value from the modern service industry was 549,237 million yuan, up 12.6 % compared with the previous year; new and high-tech product exports were 169,018 million USD, up 19.7 %; the number of granted patents was 49,756, up 2.2 %. The powerful engine of the modern service industry, the effect of the strong industrial scale and the excellent support conditions for industrial transformation have created

¹³Relevant evaluation result is shown in Report on Industrial Transformation Development of China's Special Economic Zones in *Development Report on China's Special Economic Zones (2013)*. Source: Yuan Yiming, Zhou Yikun, Yan Zhenkun, Report on Industrial Transformation Development of China's Special Economic Zones, *Development Report on China's Special Economic Zones (2013)* [M], Social Sciences Academic Press, April, 2014, the 1st edition, p.39.

Table 2.3 Rotated common factor loading matrix

	Component			
	1	2	3	4
Industrial added value growth rate	−0.008	0.027	0.976	−0.217
Modern service industry growth rate	0.526	−0.033	−0.850	0.025
Service industry investment growth rate	−0.223	−0.228	0.061	−0.946
Three-industry structural change value	−0.306	0.489	−0.497	0.648
Service industry structural change value	−0.159	0.978	0.094	0.098
Secondary industry structural change trend value	−0.385	−0.265	0.545	0.697
Tertiary industry structural change trend value	−0.205	0.962	0.145	0.106
Output value from the modern service industry	0.981	−0.127	−0.145	0.015
Output value from advanced industries	0.988	−0.129	0.014	0.088
Energy consumption efficiency per unit of industrial added value of the enterprise	0.266	0.268	0.836	0.397
The proportion of total profits in unit of industrial added value	0.034	0.996	−0.060	0.058
New and high-tech product export trade volume	0.996	−0.082	−0.021	0.017
The number of granted patents	0.991	−0.055	0.006	−0.126

Table 2.4 Component score coefficient matrix

	Component			
	1	2	3	4
Industrial added value growth rate	0.034	0.036	0.338	−0.134
Modern service industry growth rate	0.087	0.005	−0.273	0.033
Service industry investment growth rate	−0.061	0.018	0.029	−0.473
Three-industry structural change value	−0.065	0.076	−0.191	0.295
Service industry structural change value	0.009	0.305	0.028	−0.056
Secondary industry structural change trend value	−0.077	−0.177	0.159	0.383
Tertiary industry structural change trend value	0.0002	0.297	0.044	−0.051
Output value from the modern service industry	0.212	−0.002	−0.015	0.027
Output value from advanced industries	0.219	−0.010	0.039	0.063
Energy consumption efficiency per unit of industrial added value of the enterprise	0.103	0.060	0.290	0.165
The proportion of total profits in unit of industrial added value	0.048	0.323	−0.016	−0.076
New and high-tech product export trade volume	0.222	0.014	0.028	0.021
The number of granted patents	0.222	0.038	0.040	−0.057

good conditions for Shenzhen to accelerate its industrial transformation; however, compared with the other four special economic zones, Shenzhen is experiencing a period during which industrial upgrading and transformation are affected by the following three factors: spatial constraint—insufficient space for three-industry

Table 2.5 Ranking of comprehensive scores of the industrial transformation capability of the five major special economic zones

Special economic zones	Transformation strength factor score	Transformation power factor score	Transformation potential factor score	Transformation vitality factor score	Comprehensive score	Ranking
Shenzhen	0.628911	-0.0288	-0.03859	-0.02474	0.536775	1
Zhuhai	-0.11115	0.450245	0.046028	0.017192	0.402312	2
Xiamen	-0.10313	-0.18027	0.210785	0.210778	0.138165	3
Shantou	-0.1961	-0.13993	0.15338	-0.23181	-0.41446	4
Hainan	-0.21853	-0.10125	-0.3716	0.028581	-0.6628	5

structure conversion, investment constraint—stagnant investments in the modern service industry, slow development of the manufacturing industry—low growth of the industrial added value.

Zhuhai became relatively balanced in transformation power, transformation potential and transformation vitality scores; in particular, Zhuhai enjoyed leading advantages in its transformation power factor score. Regarding the indicator components in factor composition, indicators such as the service industry structural change value and the proportion of total profits in the unit of industrial added value served as the main load factors among transformation power factors. In Zhuhai in 2013, the structural change value of the service industry, the structural change trend value of the tertiary industry and the proportion of total profits in the unit of the industrial added value were 47 %, 1.71 and 0.38 respectively, while these three indicators far surpassed those in the other four special economic zones. Accelerating the adjustment of the industrial structure, the quickened expansion of the tertiary industry and an increasing industrial performance have objectively expedited Zhuhai's industrial transformation; however, Shenzhen had a relatively large gap with Zhuhai in industrial scale and industrial transformation support conditions.

Xiamen had a great superiority in the transformation potential factor and in the transformation vitality factor. With regard to the indicator components in factor composition, the growth rate of industrial added value, the growth rate of service industry investments, energy consumption efficiency per unit of industrial added value of enterprises, the three-industry structural change value and the secondary industry structural change trend value had a relatively heavy weight in the transformation potential factor and the transformation vitality factor. In 2013, Xiamen enjoyed relatively great advantages in energy consumption efficiency per unit of industrial added value of enterprises and in the growth rate of industrial added value, which were core factors for Xiamen's industrial transformation capability. However, relatively low scores in transformation strength and transform power were the main causes for making it difficult for Xiamen to develop comprehensive leading advantages in industrial transformation among the five major special economic zones.

Shantou had a comparative advantage in the industrial transformation potential factor. Shantou ranked only second to Xiamen in comprehensive scores regarding industrial transformation capability among the five major special economic zones. With regard to the other three factors, Shantou ranked No.4 in industrial transformation strength and industrial transformation power factors, and No.5 in industrial transformation vitality factor among the five major special economic zones. Hainan had a comparative advantage in its industrial transformation vitality factor score, while its scores for the other three factors were negative, suggesting that Hainan had the lowest comprehensive capability for industrial transformation among the five major special economic zones.

Policy Suggestions Concerning the Industrial Transformation Development of the Special Economic Zones

Develop a Strategy for Fostering Differentiated Industrial Development, Elevate the Industries in the Special Economic Zones to High Levels

Modern industries are the fundamental conveyors of the industrial transformation of the special economic zones. In recent years, Shenzhen has become home to a system of modern industry that is dominated by the modern service industry, the modern manufacturing industry, the high and new technology industry, strategic emerging industries and future industries. Relatively, although there are also modern industries with a certain scale in Zhuhai, Xiamen and Shantou, generally the high and new technology industry and the modern service industry are the main part of modern industries in these three special economic zones, where the attention paid to distinctive strategic emerging industries and future industries is limited, and a modern industry system with a scientific layout has not yet taken shape. In recent years, importance has been attached to the construction of an island of tourism in Hainan, where the modern service industry and the real estate industry have become the main forces for driving industrial development; however, the development of the modern manufacturing industry and the high and new technology industry lags extremely far behind, and there is still a long way to go for building a modern industrial system, and it is also difficult to organize vigorous support for high-end development in Hainan. Shenzhen's experience in building a modern industrial system deserves to be drawn upon by the other four special economic zones. In order to achieve a high-end industrial development of the special economic zones in the future, it is essential to abandon the industrial developmental mode which relies on a single industry or several fields and proceed from the actual local situation in the special economic zones to build a modern industrial system that is capable of tapping its own factor endowment and location advantage.

Discard the Philosophy of Emphasis on Speed, Resolutely Take Upgrading as the Cardinal Line of Action, and Cultivate the Forces for the Industrial Transformation of the Special Economic Zones

Equal emphasis on both the speed of industrial development and quality performance is the basic requirement for taking practical actions in the special economic zones, including Shenzhen, Zhuhai and Shantou, in the new period to move towards the following objectives set by General Secretary Xi Jinping during his inspection

of Guangdong Province: actions should be taken to make Guangdong become the vanguard for developing socialism with Chinese characteristics, and the place for pioneering in deepening the reforms, the experimental area for exploring scientific development, and the first to build a moderately prosperous society in an all-round way and basically realize socialist modernization. With a focus on a balance between the speed of industrial development and quality performance, the industrial transformation of the special economic zones has followed different paths. On the one hand, emphasis was placed on building “Shenzhen Quality” in the special economic zones represented by Shenzhen, while in Shenzhen, in parallel with the optimization and improvement of the industrial structure, secondary industry investments, especially the growth rate of industrial investments, significantly declined, and the change trend value of industrial investments in industrial structure has also obviously lagged behind that in the other four special economic zones; on the other hand, industrial development accelerated in the special economic zones represented by Hainan, while in Hainan, as the speed of industrial development increased, electricity consumption per unit of industrial added value of enterprises was high, and the proportion of total profits in the unit of industrial added value was relatively low, suggesting that there was room for improving the quality and performance of industrial development. Shantou, Zhuhai and Xiamen, besides Shenzhen and Hainan, also experienced a lack of coordination between the speed of industrial development and quality performance. Take Xiamen as an example, in 2013, the industrial added value from the three industries grew significantly, but from the perspective of the quality and performance of industrial development, total profits from industrial enterprises above the designated scale decreased by 2.6 % and investment income fell by 40.7 % compared with the previous year. In fixed asset investments in the tertiary industry, real estate investments accounted for as high as 50.2 % of urban investments, and more than 50 % of total investments were made in speculative real estate development. A lack of coordination between the speed of industrial development and quality performance not only is not beneficial for enhancing internal coordination in the industrial development of the special economic zones, but it also greatly restricts the potential for the industrial transformation of the special economic zones.

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